MAPPING SPATIAL ATTRIBUTES FOR CONSERVATION AND TOURISM PLANNING, OTWAYS REGION VICTORIA

SURVEY OF RESIDENTS AND VISITORS

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Technical Reports

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SUMMARY

Introduction

The project was undertaken to better understand resident and visitor preferences for conservation and tourism development in the Otways region of Victoria, Australia. The project used a survey technique where participants were asked to map place-specific landscape values and development preferences with the goal of identifying priority areas for conservation, development and resource management in the region. Two survey instruments were developed for the study – one for Otway residents and one for visitors to the region.

The survey technique was developed for regional land use planning and management applications and has been applied to five different planning studies in the US, and more recently, a tourism planning study for Kangaroo Island, South Australia. The mapping methods, when combined with a sound sampling plan, provide a multi-dimensional view of the Otways region from a social-ecological perspective. The method generates a series of GIS maps that show various perceived landscape values (e.g. aesthetic, recreation, biological diversity and life sustaining) and their locations on the regional landscape.

Because the survey accessed a representative sample of Otways residents, the spatial data can be used to examine whether existing or proposed government initiatives are consistent for publicly held values in the region. In recent years, the Otways region has been the subject of several reviews of land management options resulting in the 'Angahook-Otway Investigation Final Report' (Victorian Environmental Assessment Council 2004) calling for an expanded Great Otway National Park and the 'Tourism Plan for the Public Land within the Otway Hinterland' (Department of Sustainability and Environment Victoria 2003) that recommends expanded tourism opportunities in the Otway Hinterland. Two new land classifications titled the Great Otway National Park and Otway Forest Park appear in the National Parks (Otways and Other Amendments) Bill (Vic.) 2005 in response to the Victorian Government's commitment to cease native forest logging in the region by 2008; these reclassified lands are zoned for conservation and recreation, respectively. Using simple modelling techniques, planning alternatives can be compared with resident and visitor values and preferences for tourism development (Chapter 3) and reconfigured public land management allocations (Chapter 4) including the expanded Great Otway National Park. The spatial mapping technique can also identify areas of intense public values that may be overlooked using traditional public consultation processes.

Objectives of Study

The overall objectives for this study included to:
- Examine the similarities and differences among Otways residents and visitors toward tourism growth, development and conservation along the Otway Coast, and in hinterland and plains subregions.
- Determine whether proportional differences exist between Otways resident and visitor tourism development preferences (acceptable vs. inappropriate) within selected Otways tourism destinations.
- Identify, map and compare perceived landscape values in Otways national parks and state forests.
- Identify the landscape values that best differentiate national park lands from other lands.
- Assess whether the proposed expanded Great Otway National Park is consistent with resident and visitor held values and preferences.
- Examine community activity preferences in the proposed expanded park system.
- Assess whether proposed tourism development nodes in the Otway Hinterland tourism plan are consistent with resident and visitor preferences.
- Determine whether place identity and dependence emerge as distinct constructs of place attachment in Australia.
- Identify respondent variables that are most predictive of place attachment.
- Determine what relationship, if any, exists between place attachment constructs and the types of landscape values that respondents map using the spatial survey methodology.

Methodology

This section provides an overview of the different methodologies used in this study to:
- Design and administer a postal survey to 1400 residents in the Otways region.
- Design and administer a postal survey to 500 visitors to the Otways region.
- Analyse similarities/differences between survey respondent subgroups (coastal, hinterland and plains residents and Otways visitors) on a variety of survey questions measuring attitudes and preferences for

tourism development and resource conservation using a variety of statistical analysis methods (e.g., ANOVA, t-tests and chi-square).
- Digitise resident and visitor landscape value and development preferences in GIS and examine responses for consistency with current and proposed public land classifications in the Otways.
- Examine survey responses for consistency with proposed tourism development nodes in the Otway Hinterland using GIS mapped landscape values and development preferences.
- Use factor analysis and reliability analysis to validate place identity and dependence constructs.

Key Findings

The key findings of this project are:
- Otways region residents and visitors are divided over threats posed by tourism and natural resource management to their quality of life or visitor experience. Overall, tourism has not changed the desirability of the Otways as a place to live or visit (52.8% indicated it has stayed the same), but more coastal residents believe that tourism has made the Otways a less desirable place (38.4%) compared to hinterland residents (22.9%), plains residents (17.1%) and visitors (16.1%).
- Of the major economic sectors, Otways residents in general perceive that tourism development is most likely to contribute to the future economic prosperity and community well-being of the Otway Hinterland (35.8%). Both residents and visitors would prefer slow growth in visitor numbers (defined as +1% annually) in the hinterland (56.3%).
- All residents perceive that tourism would most likely contribute to the Otway Coast's future economic prosperity and community well-being (71.1%). But further analysis indicates a high proportion of coastal (42.8%), hinterland (52.5%) and plains (38.1%) residents perceive the current level of coastal development is too much; a perception also shared by visitors to the region (39.8%).
- Both residents and visitors oppose major hotels in Otways townships, fast-food outlets and industrial/manufacturing facilities. Coastal residents also oppose commercial/retail centres in the Otways region.
- Residents and visitors differ in their attitudes toward Otways forestry management. Hinterland and plains residents generally favour logging of native forests up to 2008 (48.4% and 49.9% favour, respectively) whereas coastal residents and visitors oppose the practice (55.8% and 77.3% oppose, respectively).
- With respect to appropriate nature-based activities in the Otways, both residents and visitors support horse riding and mountain-biking on formed tracks, recreational fishing, nature study/wildlife observation, picnicking, walk-in camping, vehicle-based camping, bushwalking and commercial tour operations in the proposed Great Otway National Park; and oppose livestock grazing, mining and timber harvesting.
- Otways residents support tourism development at Lavers Hill and Melba Gully (66.8% favour); Otway Fly, Triplet Falls and Victree (64.9% favour); Cape Otway Lighthouse Station (62.5% favour); and around Forrest, Barwon Dam and Elizabeth (61.8% favour); but there is not majority support for tourism development at Glenaire/Aire River Estuary (48.0% favour).
- Respondent mapping of tourism development preferences were generally consistent with the survey question responses, but with some important differences. There is strong support for tourism development at Lavers Hill/Melba Gully and Forrest/Lake Elizabeth tourism centres from both residents and visitors, but residents strongly oppose and visitors mildly oppose tourism development at the Otway Fly and Triplet Falls centre.
- Coastal and hinterland residents are more attached to the Otways than plains residents. They identify more strongly with statements measuring place identification (the degree to which the Otways provide personal meaning), as well as place dependence (the degree to which the Otways is seen as the best place for their important activities).
- The majority of survey respondents indicate good (57.4%) or fair knowledge (24.8%) of places in the Otways, and have lived in the Otways for an average of 27 years (median value = 23 years). Visitors indicate less knowledge of places in the Otways than residents, with the majority expressing fair (45.5%) or good (34.3%) knowledge. Most respondents have visited the Otways more than 10 times (46.0%); however, a high proportion visited less than 3 times (31.8%).
- The transfer of state forests to a Great Otway National Park, as proposed by VEAC and legislated by the Victorian Parliament, is consistent with resident held landscape values.
- Residents and visitors generally support tourism development at the tourism nodes proposed in the Otway Hinterland tourism plan, but not in the specific areas identified by the nodes. Residents would prefer development be restricted to existing townships and not infringe on more natural areas as suggested in the tourism plan.

- Spiritual values for the landscape are significantly associated with two dimensions of place attachment named place identity and place dependence. Spiritual values are clustered along the Otways Coast, a region of intense tourism and recreation activity.

Future Action

The spatial survey methodology in the Otways study achieved relatively high response rates (40% residents; 45% visitors) for use in regional tourism and natural resource planning. The study results and spatial data should be distributed to local government and resource management agencies for use in future land use planning efforts.

The survey results provide important baseline information about the views, attitudes and socioeconomic characteristics of Otways region residents and visitors. We also mapped the landscape values of both residents and visitors to contribute to improved tourism planning and natural resource management outcomes. The establishment of this baseline data provides an important opportunity to be able to track changes over time and contribute to the monitoring and evaluation of natural resource management and tourism activities across the region.

The spatial survey methodology has numerous applications including:

- Monitoring and evaluation of community capacity building, institutional reform and community engagement strategies.
- Prioritisation of tourism and recreational sites for conservation or development.
- More integrated assessment and revision of protected area allocations.
- Assessment of cultural heritage, as perceived by different interest groups.
- Identification and integration of Indigenous Peoples' values into resource management policy.
- Planning and review of urban and regional land use zonings, including commercial, industrial, residential, watershed protection and conservation zones.
- Assessment of property turnover in Australia, including the values held by those landowners leaving, staying or arriving on the farm, and how these differing values influence land management practices.

Chapter 1

INTRODUCTION

Conservation and Tourism Development in the Otways Region

The Otways region, located along the south-western coastline of Australia, is one of Victoria's fastest growing tourism destinations (VEAC 2004). The main tourist attraction in the region is the Great Ocean Road (GOR), a world class driving experience which extends 242 km and encompasses breathtaking coastal views and rugged coastal landforms such as the Twelve Apostles. Placed in the context of Butler's (1980) destination life cycle model, the Otway Coast, the subregion within 5 km of the coastline (see Figure 1), is experiencing 'accelerated development.' Traffic often exceeds the GOR's capacity and poorly planned development threatens the quality of life of coastal residents and the ecological integrity of coastal heathlands (VEAC 2004).

Conversely, the Otway Hinterland, the area containing the mountains and the forests up to 30 km from the coast, is in a stage of 'exploration' (Butler 1980). Following a recent state government decision to cease logging of native forests in the region by 2008 (VEAC 2004), integration of the hinterland into the destination product has been proffered as a means to increase the length of stay in the hinterland, reduce the pressure on the GOR, and convert forestry dependent economies into tourism. The draft 'Tourism Plan for the Public Land within the Otway Hinterland' (DSE 2003) recommends the development of three nodes (one or more individual attractions which creates a place of interest). They are: (1) a nature-based node around the Otway Fly, Triplet Falls and Victree sites; (2) a nature and rural node around Lavers Hill and Melba Gully; and (3) a nature and rural node around Forrest, Barwon Dam and Lake Elizabeth.
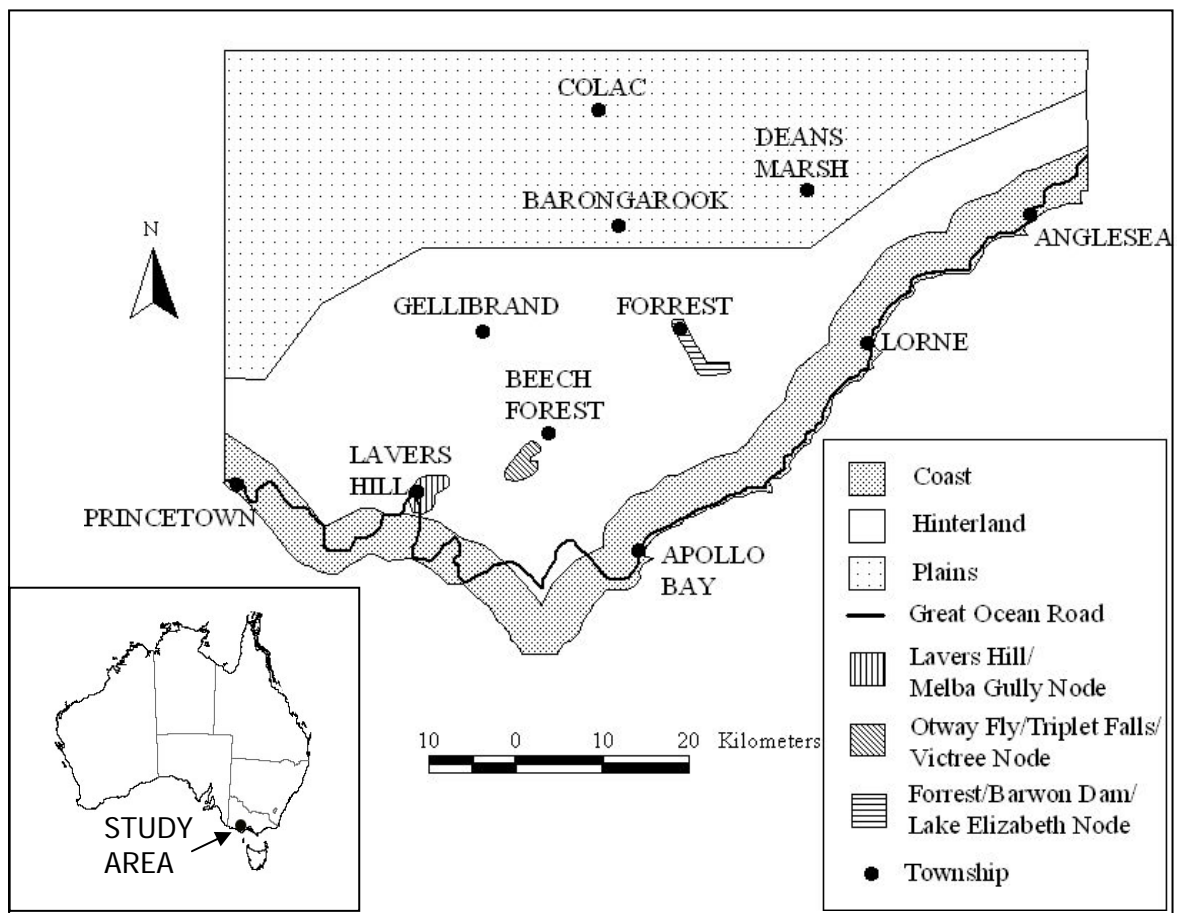
Figure 1: Map of Otways study area

The tourism plan has a strong marketing focus and devotes little attention to local citizen values and the social and environmental effects of tourism. The main aim of the plan is to attract more tourists from the GOR into the hinterland and to encourage people to stay longer and spend more by promoting a focus on hinterland experiences (DSE 2003). Higgins-Desbiolles (2005) argues that this ideology of economic growth and consumer capitalism is squandering the wider benefits of tourism as a social force for the preservation of cultures (Cohen & Kennedy 2000), for the empowerment of local communities (Garrod 2003), as a 'spiritual quest' for tourists (Graburn 1989), and for the restoration and conservation of environments (Inskeep 1991; Richardson 1993).

This research project accepts as its basic premise that local citizens as well as visitors to a region possess valuable information about the most acceptable types and locations of tourism development for a region and builds upon work by Leiper (1990, 1995) and Dredge (1999) who advocate a systematic approach to destination planning. Dredge (1999) developed spatial models for incorporating travel patterns, attraction systems (Leiper 1990) and nodal structure (Leiper 1990; Gunn 1993) into the local land-use planning framework. These models are largely conceptual but they reinforce the importance of integrating tourism destination planning into the statutory land-use context that regulates the types and scale of developments in local jurisdictions. Unfortunately, planners do not have the necessary tools to incorporate public opinion into the planning context in a systematic and rationally defensible manner (Forrester 1989; Dredge 1999), resulting in developments that favour commercial interests over majority public sentiment. In Australia, local governments are obligated under various acts and regulations to invite written submissions from the public on development policies (Australian Local Government Association 2004); however, these responses are qualitative and planners have no systematic method of including comments into the planning process (McGuirk 2001).

To better integrate public consultation into land use planning processes, Brown (2005) developed a quantitative and systematic approach to soliciting expressed landscape values, special places and development preferences in a survey research methodology. Respondents are asked to map landscape values and special places in a planning region using a landscape values typology. The mapped spatial locations provide a rational basis on which to determine whether proposed development and/or conservation activities are consistent with publicly held values for the planning area. The methodology has been called 'values suitability analysis' (Reed & Brown 2003) and describes the general process of determining the consistency of public values with proposed management alternatives. This method has been applied in four resource management applications in Alaska (Brown 2003; Reed & Brown 2003; Brown, Smith, Alessa & Kliskey 2004; Brown & Alessa 2005) and one in Australia (Brown & Hale 2004). The landscape value typology was validated in a U.S. national forest planning application (Brown & Reed 2000) with the majority of survey participants having little difficulty understanding and responding to the typology of values.

To better understand tourism and development preferences by residents and visitors to the Otways region, we developed and administered a mail survey that included both traditional survey questions (attitudes, beliefs, preferences and demographics) and the spatial mapping component. Chapter 2 will describe the general methods used in the Otways study and Chapters 3, 4 and 5 will summarise the results of the study. Chapter 3 reports responses to the survey questions and examines tourism development preferences for selected Otways tourism nodes and destinations using both survey responses and respondent mapped data. Chapter 4 describes the spatial distribution of landscape values and development preferences and examines land use classifications in the Otways based on respondent mapped landscape values. Chapter 5 explores some of the dimensions of place attachment in the Otways region and the potential relationships between place attachment and perceived landscape values. The report is concluded in Chapter 6. We discuss some of the key findings presented in Chapters 3 to 5 and their implications for conservation and tourism planning.

Chapter 2

METHODS

Study Location – the Otways Region of Victoria

The Otways region is located in south-west Victoria, Australia, and is bordered by the townships of Anglesea, Princetown and Colac (see Figure 1). In consultation with Parks Victoria, subregions of residence were defined as 'coast', within 5 km of the coastline, 'hinterland', the area broadly perceived as containing the mountain ranges and native forests, and 'plains', the remaining flat area of land in the northern Otways study area.

Sampling

We collected a random sample of Otways residents by examining the 2003 electoral roll for the division of Corangamite, Victoria (Australian Electoral Commission 2003). Residents were selected from 44 Otways region communities at an interval of 25 and from a random starting point. We attempted a census of hinterland residents because a proportional sample of the sub-region (n < 40) would not have provided enough observations for statistical analysis. A sample size of 1,400 respondents was deemed sufficient for multivariate analyses assuming a minimum response rate of 380 respondents, a 95% confidence interval and a sampling error of +/- 5% on a dichotomous variable (Salant & Dillman 1994, p. 55). The sampling frame was representative of all residents over the age of 18 because of mandatory voter registration laws; it excluded temporary residents who may reside in coastal holiday homes during summer months.

We collected visitor names and addresses by a convenience sample at the tourism destinations of the Otway Fly, Lorne, Maits Rest, Big Hill Campground and Sharpes Campground during the peak visitation time of 11:00am to 5:00pm. These sites were selected in consultation with park management staff on the basis of high visitation. At the designated sample sites, all visitors who passed three stationed research assistants were asked to participate in the survey, except minors under the age of 18, and overseas visitors. The visitor sample is not assumed to be representative of the visitor population; however, it does provide a basis for comparing resident and visitor expectations and is considered important for determining future tourism threats and opportunities in the region.

Survey Procedure

In January 2005, we conducted a mail survey of Otways residents and visitors using a modified Total Design Method (Dillman 1978), a procedure used in Alaska on three previous mail surveys (Brown, Reed & Harris 2002; Brown et al. 2004; Brown & Alessa 2005). Survey administration involved three mailings: (1) introductory letter informing of the purpose of the research; (2) complete survey packet; and (3) second complete survey packet to non-respondents from the first round.

The resident mail survey contained questions in seven sections: (1) resident familiarity with and attachment to the Otways region; (2) potential threats to quality of life; (3) perception of appropriate activities for the Otways national parks and other public lands; (4) acceptable visitor growth rates for the Otways coast and hinterland; (5) appropriate development options for the region; (6) identification of landscape values, special places and development/no development preferences; (7) respondent characteristics (for example, community of residence, age, level of formal qualification, gender, occupation and association with tourism). The actual resident survey appears as Appendix A.

The visitor mail survey also contained questions in seven sections: (1) visitor familiarity and attachment to the Otways region; (2) potential threats to the Otways visitor experience; (3) perception of appropriate activities for the Otways national parks and other public lands; (4) acceptable visitor growth rates for the Otways region and other development issues; (5) appropriate development options for the region; (6) identification of landscape values, special places and development/no development preferences; (7) respondent characteristics. The actual visitor survey appears as Appendix B.

In section six of both surveys, we asked participants to place mnemonically coded sticker dots representing 12 different landscape values (see Appendix C), up to six special place locations and three development preferences on a 1:125 000 greyscale Otways map (Spatial Vision 2001) provided with the survey. The development preferences included 'no development', 'residential development', 'tourism service development' and 'tourism accommodation development'. Upon return, the 12 landscape values, special place locations and

four development preference locations were digitised using ArcView® GIS software. After eliminating obvious point outliers, a total of 21,423 resident and 7,077 visitor point locations were available for analysis.

Analysis Methods

Survey data

We determined differences in attitudes and preferences toward tourism growth and development using a combination of chi-square, t-tests and one-way ANOVA statistical tests performed in SPSS® software. We used cross tabulations with chi-square tests on categorical dependent variables such as 'development type most likely to contribute to the Otways region's future economic prosperity and community well being'. We used independent samples t-tests to determine overall differences between resident and visitor attitudes toward development options and one-way ANOVA to determine differences among the three subregions of residence (coast, hinterland and plains). We used Bonferroni post-hoc tests to determine differences based on subregion of residence because it has the greatest statistical power when the number of comparisons is small (Field 2000).

Spatial data

We applied four analysis techniques to the spatial data in this report: 1) descriptive mapping; 2) proportionate analysis; 3) simple raster modelling; and 4) predictive modelling. The latter method uses discriminant analysis of the landscape values to discriminate between the land classifications (national park, state forest and private land) to identify the best fit for future land classifications. Some of the methods are described briefly below and in more detail in Chapter 4 when the data is presented.

To analyse whether there are proportional differences between resident and visitor tourism development preferences (acceptable vs. no development) within selected Otways tourism nodes and destinations, we established a study area polygon to capture respondent identified value locations, but to exclude obvious point outliers. The selected study area polygon consisted of the Otways region buffered to approximately 2000 m offshore. We selected the respondent mapped development preferences to determine the proportion of 'no development' (recoded as 'inappropriate development') and 'acceptable development' locations that fell inside and outside the tourism centres identified in the Otway Hinterland tourism plan, and then applied a chi-squared statistic to determine whether proportional differences exist in development preferences based on subregion of residence.

To analyse whether perceived landscape values differ between national parks, state forests and private lands, we classified landscape value spatial locations as either being 'inside the national park', 'inside the state forest' or 'inside private land' by using a spatial join of the landscape values with the existing and proposed land classification boundaries. Each value was coded with a unique identifier of 1, 2 or 3 representing the different classifications. Cross-tabulations with chi-square analysis were completed in SPSS® for each landscape value to determine whether the observed proportion of landscape values located inside the national park deviated from the expected number of values located in the state forest or other lands. Large differences between the actual and expected number of landscape values in each land designation result in high χ^2 values and a lower probability that the distribution of values is the result of chance alone.

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Chapter 3

RESIDENT AND VISITOR ATTITUDES TOWARD TOURISM GROWTH AND DEVELOPMENT AND SELECTED NATURAL RESOURCE MANAGEMENT ISSUES

Survey Response Rates

We received a total of 563 resident responses for an overall response rate of 40% after adjusting for non-deliverable surveys. About 90% of those residents completing the survey also completed mapping questions asking to identify specific place values in the Otways region.

We received a total of 216 visitor responses for an overall response rate of 45%, after adjusting for non-deliverable surveys. About 88% of those visitors completing the survey also completed the mapping questions.

Affects of Tourism on Desire to Live or Visit the Otways Region

Otways region residents and visitors are divided over threats posed by tourism to their quality of life or visitor experience. Overall, tourism has not changed the desirability of the Otways as a place to live or visit (52.8% indicated it has stayed the same), but more residents than visitors believe tourism has decreased the desirability of the region (26.6% vs. 16.1%).

There are regional differences in resident attitudes toward tourism. More coastal residents believe that tourism has made the Otways a less desirable place (38.4%) compared to hinterland residents (22.9%), plains residents (17.1%) and visitors (16.1%). Coastal residents perceive increased visitation, increased number of residents, loss of coastal scenery and vegetation clearing (for agriculture or housing) as greater threats to their quality of life than hinterland and plains residents. For example, one coastal resident stated:

> 'New residents are bringing suburban values and ideals to a bush environment - inappropriate housing, clearing of native vegetation (loss of habitat), cats, demand for excessive street lighting, demand for the types of commercial facilities they left behind. (There is) paranoia regarding bushfires, leading to almost total clearing of bush blocks.'

We presented residents with a hypothetical question about living somewhere other than the Otways with the same standard of living or continuing to live in the Otways. About 71% indicated they would still live in the same Otways community, about 14% said they would move to a different Otways community, and about 15% responded they would move away from the Otways. Overall, residents remain highly satisfied with their quality of life in the Otways. Visitors to the Otways also show high satisfaction levels with their Otways experience with few visitors (2.3%) indicating they would visit the Otways less or not plan to return at all (3.3%).

Threats to Otways Quality of Life or Visitor Experience

We asked residents to respond to a list of potential threats to the Otways quality of life. The items were presented as statements that respondents could indicate their level of agreement or disagreement on a 5-point Likert scale from '1 = Strongly Agree' to '5 = Strongly Disagree'. A response of '3' indicated neither agreement nor disagreement. The responses are listed in Table 1 from largest to least perceived threat.

Table 1: Potential threats to resident quality of life in the Otways

Item	Mean[a]	Standard Deviation	Rank
loss of coastal scenery	2.17	1.166	1
state forest decisions	2.37	1.121	2
visitor/tourist behaviour	2.40	1.123	3
quality of state government	2.40	1.154	3
quality of local government	2.41	1.131	5
new housing subdivisions	2.42	1.187	6
national park decisions	2.43	1.146	7
vegetation clearance	2.58	1.252	8
increasing house/land prices	2.61	1.143	9
increased number of visitors	2.75	1.138	10
lack of economic opportunities	2.79	1.128	11
commercial forestry	2.81	1.355	12
increased number of residents	2.90	1.102	13
quality of education	3.03	1.086	14
prescribed burning forest areas	3.42	1.273	15

[a]Mean values range from '1 = Strongly Agree', '2 = Agree', '3 = Neither Agree or Disagree', '4 = Disagree' and '5 = Strongly Disagree'. The gap before the last two items indicates the mean value crosses over from agreement to disagreement.

The largest perceived threat is from the loss of coastal scenery, followed by state forestry decisions and visitor/tourist behaviour. From a resident perspective, decisions about land development by local government and resource management decisions by state agencies pose the greatest threats to resident quality of life. Residents disagree with two items posing a threat - the quality of education and the prescribed burning of forest areas.

We presented Otways visitors with a similar, but not identical, list of potential threats to the visitor experience. The responses are listed in Table 2 from largest to least perceived threat.

Table 2: Potential threats to visitor experience in the Otways

Item	Mean[a]	Standard Deviation	Rank
loss of coastal scenery by development	1.77	0.915	1
vegetation clearing	1.85	0.901	2
other negative visitor/tourist behaviour	1.90	0.738	3
poor national park management decisions	1.92	0.897	4
commercial forestry	1.99	0.988	5
increased number of residents	2.52	0.941	6
poor quality of directional signage	2.53	1.042	7
increased number of visitors	2.57	0.911	8
poor quality of Otway roads	2.59	1.063	9
poor quality of tourism services	2.63	1.078	10
prescribed burning in forest areas	2.85	1.056	11

[a]Mean values range from '1 = Strongly Agree', '2 = Agree', '3 = Neither Agree or Disagree', '4 = Disagree' and '5 = Strongly Disagree'.

Similar to resident perceptions, the greatest potential threats to the visitor experience are decisions that involve land use or resource management decisions, with the loss of coastal scenery and vegetation clearing posing the greatest threats and prescribed burning posing the least threat to the visitor experience.

Type of Development Contributing to Otways Future Economic Prosperity

We asked Otways residents which type of development would most likely contribute to the Otway region's future economic prosperity and community well-being in the coastal and hinterland subregions (see Table 3). Of the major economic sectors, Otways residents in general perceive that tourism development is most likely to contribute to the future economic prosperity and community well-being of the Otway Coast (71.1%) and Otway Hinterland (35.8%). Residents have much less certainty about which sector will most likely contribute to the hinterland's economic prosperity with agriculture and forestry also perceived as contributing to the subregion's

future economic prosperity. The differences in regional perceptions among coastal, hinterland, and plains residents are statistically significant ($p < 0.05$) but there is general agreement on the most important sectors.

Table 3: Types of development most likely to contribute to Otways region economic prosperity and community well-being in hinterland and coastal areas

Otway Hinterland						
	All residents	Coast	Hinterland	Plains	χ^2	p
Residential (n=44)	8.3	8.1	10.3	7.4		
Retail/commercial (n=39)	7.3	5.2	7.8	8.6	30.52	0.001
Tourism (n=190)	35.8	37.2	34.5	35.4		
Forestry (n=69)	13.0	8.7	6.9	18.9		
Agricultural (n=128)	24.1	32.0	20.7	20.2		
Other (n=61)	11.5	8.7	19.8	9.5		
Total	**100.0**	**100.0**	**100.0**	**100.0**		
Otway Coast						
	All residents	Coast	Hinterland	Plains	χ^2	p
Residential (n=41)	7.6	9.2	5.9	6.9		
Retail/commercial (n=23)	4.3	5.7	4.2	3.3	18.64	0.045
Tourism (n=382)	71.1	72.4	64.4	73.5		
Forestry (n=20)	3.7	1.1	3.4	5.7		
Agricultural (n=12)	2.2	1.1	4.2	2.0		
Other (n=60)	11.1	10.3	17.8	8.6		
Total	**100.0**	**100.0**	**100.0**	**100.0**		

Preferences for Tourism Growth and Development

Several questions asked residents and visitors to describe the current level of hinterland tourism development and coastal tourism development and their personal preferences for future visitor growth. For hinterland tourism (Table 4), proportionately more Otways region residents prefer a higher level of tourism development compared to visitors to the region, χ^2 (2, N = 667) = 14.14, $p < 0.05$, but both groups support slow growth, defined as +1% per annum, over any other growth type, χ^2 (4, N = 679) = 7.72, $p \geq 0.05$. All resident subgroups feel the current level of hinterland tourism development is about right, χ^2 (4, N = 505) = 3.23, $p \geq 0.05$, and support slow visitor growth over any other growth type, χ^2 (8, N = 491) = 1.17, $p \geq 0.05$.

Table 4: Preferences for hinterland tourism growth and development

Variable	Residents	Visitors	χ^2	p	Coastal Residents	Hinterland Residents	Plains Residents	χ^2	p
Tourism development level			14.14	0.001				3.23	0.521
Not enough (n=216)	35.8	21.7			34.0	30.8	39.7		
About right (n=388)	54.2	70.8			56.0	59.0	50.2		
Too much (n=63)	10.1	7.5			10.1	10.3	10.0		
Total	**100.0**	**100.0**			**100.0**	**100.0**	**100.0**		
Visitor growth rate			7.72	0.102				1.17	0.997
+5% annum (n=97)	16.3	9.1			18.2	14.7	15.7		
+1% annum (n=382)	55.7	57.8			53.9	56.0	56.7		
0% annum (n=175)	24.6	28.9			24.2	26.6	24.0		
-1% annum (n=18)	2.2	3.7			2.4	1.8	2.3		
-5% annum (n=7)	1.2	0.5			1.2	0.9	1.4		
Total	**100.0**	**100.0**			**100.0**	**100.0**	**100.0**		

Both residents and visitors expressed more negative attitudes toward tourism growth and development along the Otway Coast compared to the Otway Hinterland. Along the coast, 43.0% of residents perceive the current level of tourism development as too much (Table 5) compared to 10.1% for the hinterland (Tables 4 and 5). This view is shared by visitors to the region (39.8% coast vs. 7.5% hinterland). A higher proportion of residents and visitors also prefer no growth (defined as 0% per annum) along the coast (30.8% and 35.6%, respectively) compared to the hinterland (24.6% and 28.9%).

Table 5: Preferences for coastal tourism growth and development

Variable	Residents	Visitors	χ^2	p	Coastal Residents	Hinterland Residents	Plains Residents	χ^2	p
Tourism development level			6.08	0.051				7.25	0.123
Not enough (n=85)	13.0	7.7			13.9	9.2	14.2		
About right (n=341)	44.1	52.6			43.3	38.3	47.7		
Too much (n=310)	43.0	39.8			42.8	52.5	38.1		
Total	**100.0**	**100.0**			**100.0**	**100.0**	**100.0**		
Visitor growth rate			5.43	0.246				7.50	0.484
+5% annum (n=59)	9.5	5.8			9.3	11.5	8.6		
+1% annum (n=373)	53.5	53.4			47.7	50.4	59.3		
0% annum (n=224)	30.8	35.6			34.9	32.7	26.7		
-1% annum (n=25)	4.1	2.1			5.8	3.5	3.2		
-5% annum (n=17)	2.2	3.1			2.3	1.8	2.3		
Total	**100.0**	**100.0**			**100.0**	**100.0**	**100.0**		

Attitudes Toward Otways Regional Development Options

We presented attitudes toward various development options on a Likert scale, ranging from '1 = Strongly Favour', '5 = Strongly Oppose' and '3 = Neither Favour or Oppose'. Both residents and visitors are most supportive of nature-based development options (Table 6) including 'nature/visitor centres' (M = 1.80), 'nature-based lodges in a natural setting' (M = 1.88) and 'designated campgrounds (not caravan parks)' (M = 1.95). Both residents and visitors expressed more resistance to the establishment of caravan parks (M = 2.49), and there are some differences among subregions of residence, $F(2, 540) = 4.07$, $p < 0.05$, with coastal residents significantly more opposed to caravan parks than plains residents (Bonferroni post-hoc, $p < 0.05$).

Both residents and visitors oppose major hotels in Otways townships (M = 3.37) and fast-food outlets (M = 3.65); however, there are conflicting attitudes toward harbour developments and commercial/retail centres. Residents mildly support harbour developments (M = 2.57) and commercial retail centres (M = 2.95) whereas visitors mildly oppose these developments (M = 3.22 and M = 3.43, respectively). We found some differences among subregions of residence in attitudes toward harbour developments, $F(2, 542) = 5.25$, $p < 0.05$, with coastal residents significantly more opposed to this type of development than plains residents (Bonferroni post-hoc, $p < 0.05$).

Table 6: Attitudes toward development options for the Otways region

Development Option	Residents & Visitors Combined (Means)[1]	Residents	Visitors	t statistic	Coastal Residents	Hinterland Residents	Plains Residents
Major hotel in an Otways township	3.37	3.31	3.44	1.40	3.44	3.30	3.21
Small motel in an Otways township	2.35	2.36	2.33	0.49	2.47	2.35	2.29
Nature-based lodge in a natural setting	1.88	**1.99**[2]	1.76	4.00	1.97	2.11	1.96
Serviced apartments	2.89	**2.99**	2.79	2.45	3.08	3.07	2.89
Designated campgrounds	1.95	1.99	1.91	1.19	2.10	1.99	1.91
Caravan parks	2.49	2.43	2.55	1.58	2.61[a]	2.39[ab]	2.33[b]
Bed and breakfast accommodation	2.13	2.16	2.11	0.86	2.21	2.07	2.17
Camping with no or very limited facilities	2.51	**2.65**	2.36	3.24	2.69	2.80	2.53
Cafes	2.30	2.30	2.29	0.07	2.27	2.26	2.32
Restaurants	2.44	2.44	2.43	0.03	2.40	2.40	2.47
Fast food outlets	3.65	3.57	3.73	1.71	3.65	3.57	3.51
Harbour developments	2.89	2.57	**3.22**	6.54	2.73[a]	2.74[a]	2.39[b]
Nature/visitor centre	1.80	1.83	1.76	1.20	1.89	1.88	1.77
Commercial/retail centres	3.19	2.95	**3.43**	5.38	3.06	2.93	2.88
Boutique wineries	2.56	2.45	**2.66**	2.72	2.40	2.55	2.44

[1] Means were based on a scale ranging from 1 ='Strongly Favour', '2 = Favour', '3 = Neither Favour or Oppose', '4 = Oppose' and '5 = Strongly Oppose'.
[2] Bold numbers signify means that are significantly higher for resident or visitor groups, based on independents samples t-test (non-equal variance assumed, $p < 0.05$).
[a,b] Means with different superscripts differ significantly at $p < 0.05$ using Bonferroni post-hoc testing.

Residents and Visitors Tourism Development Preferences at Selected Otways Tourism Destinations

We conducted two types of analysis to determine development preferences for selected Otways tourism destinations. The first type of analysis examined responses to survey questions about the favourability of tourism development at various locations in the Otways. Favourability was measured on a 5-point Likert scale ranging from '1 = Strongly Favour', '3 = Neither Favour or Oppose' and '5 = Strongly Oppose'. The mean values of survey responses appear in Table 7.

Table 7: The favourability of tourism development in selected Otways tourism destinations

Tourism Location	Residents[1]	Visitors	t-test significance (p value)	Coastal Residents	Hinterland Residents	Plains Residents
Lavers Hill and Melba Gully	2.37	2.83	0.000	2.45	2.39	2.30
Otway Fly, Triplett Falls and Victree site (e.g., in Beech Forest)	2.46	2.89	0.000	2.61	2.50	2.33
Forrest, Barwon Dam and Lake Elizabeth	2.47	2.83	0.000	2.65[a]	2.45[a]	2.35[b]
Glennaire/Aire River Estuary	2.83	3.03	0.066	3.08[a]	2.94[a]	2.59[b]
Cape Otways Lighthouse Station	2.47	2.91	0.000	2.68[a]	2.41[ab]	2.34[b]

[1] Means were based on a scale ranging from '1 = Strongly Favour', '2 = Favour', '3 = Neither Favour or Oppose', '4 = Oppose' and '5 = Strongly Oppose'.
[a,b] Means with different superscripts differ significantly at $p < 0.05$ using Bonferroni post-hoc testing.

Tourism development is generally viewed as favourable at all five locations with the exception of Glennaire/Aire River Estuary where responses move closer to opposition. Residents are significantly more supportive of tourism development than visitors at the five locations. When resident subgroups are examined, coastal residents are more opposed to future tourism development while plains residents are most favourably inclined to tourism development at the five locations.

The second method of analysis examined the proportional differences of development preference dots placed by survey respondents falling inside and outside tourism destinations identified in the 'Tourism Plan for the Public Land within the Otway Hinterland' (DSE 2003), as well as selected natural areas and Otways townships. We examined proportional differences between development preferences using chi-square analysis. The results of the analysis appear in Table 8.

Chi-square analysis indicates that residents are more supportive than visitors (64.0% vs. 50.5% favour) of development in the hinterland, χ^2 (1, N = 424) = 25.57, $p < 0.05$. Tourism development (accommodation and services) is preferred within existing town boundaries rather than more natural areas (state forests and national parks). Both residents and visitors expressed strong support for development in the Forrest (96.0% and 76.0% acceptable) and Beech Forrest townships (94.6% and 88.5% acceptable) with opposition to tourism development at nature-based attractions including the Otway Fly, Triplet Falls and Victree node (69.8% and 63.4% inappropriate); Lake Elizabeth (86.8% and 66.7% inappropriate); and Olongalah Flora and Fauna reserve (97.7% and 86.7% inappropriate).

For coastal tourism, both residents and visitors support tourism development within township boundaries and oppose development in natural areas. For example, both groups support development at Apollo Bay (76.8% and 84.6% acceptable) and Lorne (71.4% and 78.2% acceptable), but strongly oppose tourism development in the current Otway National Park (83.4% and 98.7% inappropriate). Density analysis of mapped tourism development preferences (see Chapter 4) supports the finding that both residents and visitors prefer tourism development within existing townships, located along the Otway Coast and within the Otway Hinterland, rather than in natural areas.

Table 8: Proportional differences in 'acceptable tourism development' and 'no development' preferences at selected tourism nodes and destinations using respondent mapped locations

Development Scale	Development Preference	Overall[1]	Residents	Visitors	χ^2	p
Region		*Percentage*				
Coast	Development	57.8	56.6	60.7	3.82	0.051
	No Development	42.2	43.4	39.3		
Hinterland	Development	61.0	64.0	50.5	25.57	0.000
	No Development	39.0	36.0	49.5		
Plains	Development	93.1	92.5	97.9	1.89*	0.169
	No Development	6.9	7.5	2.1		
Node						
Lavers Hill and Melba Gully	Development	86.7	88.0	82.1	1.90	0.168
	No Development	13.3	12.0	17.9		
Otway Fly, Triplet Falls, and Victree site	Development	33.3	30.2	36.6	0.38	0.537
	No Development	66.7	69.8	63.4		
Forrest, Barwon Dam, and Lake Elizabeth	Development	79.0	81.0	63.9	5.63	0.020
	No Development	21.0	19.0	36.1		
Township						
Apollo Bay	Development	79.4	76.8	84.6	2.58	0.108
	No Development	20.6	23.2	15.4		
Lorne	Development	74.1	71.4	78.2	1.24	0.265
	No Development	25.9	28.6	21.8		
Beech Forest	Development	93.1	94.6	88.5	2.31	0.128
	No Development	6.9	5.4	11.5		
Forrest	Development	94.4	96.6	76.0	17.93	0.000
	No Development	5.6	3.4	24.0		
Natural Area						
Olangolah Flora and Flora Reserve	Development	5.1	2.3	13.3	2.84	0.092
	No Development	94.9	97.7	86.7		
Current Otway National Park	Development	11.8	16.6	1.3	11.48	0.001
	No Development	88.2	83.4	98.7		
Lake Elizabeth	Development	15.3	13.2	33.3	1.69	0.194
	No Development	84.7	86.8	66.7		
* indicates an expected count less than 5						

Resident and Visitor Attitudes Toward Otways Forestry Issues

Although forestry management was not the focus of the survey, the Otways region has a strong forestry heritage and forest management decisions can significantly impact the region. Therefore, several survey items asked residents and visitors about forestry practices in the Otways.

Residents and visitors have differences in opinion on Otways forest management. Forestry plantations are favoured on private lands by both residents and visitors, but residents view private plantations as more favourable (68.6% vs. 61.6%). More residents also favour plantations on public lands (45.0%) than oppose them (37.8%), but visitors are less favourably inclined toward public land forest plantations with 27.0% favouring and 46.4% opposing. Hinterland and plains residents generally favour logging of native forests up to 2008 (48.4% and 49.9% favour, respectively) whereas coastal residents and visitors oppose the practice (55.8% and 77.3%

oppose, respectively). The logging of native forests after 2008 is strongly opposed by visitors (81.5%) and more moderately opposed by residents (52.0%) (see Table 9).

Table 9: Opinions about the logging of native forests after 2008

	Strongly Favour	Favour	Neither Favour or Oppose	Oppose	Strongly Oppose	Total
Residents	87 15.7%	96 17.3%	83 15.0%	87 15.7%	201 36.3%	554 100.0%
Visitors	4 1.9%	6 2.8%	29 13.7%	45 21.3%	127 60.2%	211 100.0%
Total	**91 11.9%**	**102 13.3%**	**112 14.6%**	**132 17.3%**	**328 42.9%**	**765 100.0%**

Note: resident and visitor response differences are statistically significant χ^2, $p < 0.05$.

Appropriate Activities for Otways Public Lands

Residents and visitors were asked to provide opinions about whether certain activities were appropriate in the proposed Great Otway National Park and Otway Forest Park. By placing the survey items for the proposed national park adjacent to survey items for the proposed forest park, it is possible to determine whether the general public distinguishes between the different public land classifications. The survey items were presented on a 5-point Likert scale ranging from '1 = Strongly Agree', '3 = Neither Agree or Disagree' and '5 = Strongly Disagree'.

Both residents and visitors agree (mean values < 3) that horse riding and mountain-biking on formed tracks, recreational fishing, nature study/wildlife observation, picnicking, walk-in camping, vehicle-based camping, bushwalking and commercial tour operations are appropriate activities in the proposed Great Otway National Park (see Table 10). Residents disagree (mean > 3) that livestock grazing, mining and timber harvesting are appropriate in either public land classification. In general, the types of activities that are appropriate for a national park are also appropriate for a forest park with one notable exception: where the mean value switched from appropriate (score < 3) to inappropriate (score > 3). Four-wheel driving on formed track is considered marginally appropriate on forest park land (M = 2.95) but not in a national park (M = 3.14).

Table 10: Appropriate activities perceived by residents in the proposed Great Otway National Park and proposed Otway Forest Park

Activity	Otway National Park (Mean)[a]	Otway Forest Park (Mean)	t-test significance (p value)[b]
Horse-riding on formed tracks	2.16	1.94	0.000
Mountain-biking on formed tracks	2.23	2.04	0.000
Recreational fishing	1.82	1.67	0.000
Nature study/wildlife observation	1.44	1.44	0.816
Picnicking	1.53	1.53	0.924
Four-wheel driving on formed tracks	3.14	2.95	0.000
Walk in camping	1.90	1.84	0.016
Vehicle-based dispersed camping (with no or limited facilities)	2.80	2.60	0.000
Bushwalking	1.37	1.38	0.559
Commercial tour operations	2.58	2.45	0.000
Grazing livestock	3.33	3.23	0.000
Mining	4.19	4.08	0.000
Dog-walking along beaches	2.75	2.61	0.000
Firewood collection	2.81	2.46	0.000
Timber harvesting	3.41	3.17	0.000

[a]Mean values range from '1 = Strongly Agree', '2 = Agree', '3 = Neither Agree or Disagree', '4 = Disagree' and '5 = Strongly Disagree'.

[b] Paired samples t-test. P-values < 0.05 are considered statistically significant.

Respondent Characteristics

The sampling design was intended to create an unbiased sample of Otways residents to accurately represent residents in the region; however, there are at least 4 major sources of potential error in survey research: coverage error – how adequately the sampling frame (in this case, electoral role) covers or is inclusive of the actual sample population; measurement error – how well the survey questions measure what they are intended to measure; sampling error – how large the sample size is as a function of the target population; non-sampling error (non-response) – how much bias is introduced through non-participation. Of the 4 sources of potential error, the greatest threat to the validity of these reported results is the potential for non-response bias. One method to account for non-response bias is to assess the representativeness of respondents by comparing their characteristics with comparable ABS data.

Resident respondents are older and have completed a higher level of formal education (37.3% with tertiary or postgraduate degree) than would be expected based on comparable ABS statistics. The proportions of male and female respondents are similar to ABS data. The views expressed in the survey appear credible based on the significant collective experience and knowledge of the respondents. The majority of survey respondents indicate good (57.4%) or fair knowledge (24.8 %) of places in the Otways, and have lived in the Otways for an average of 27 years (median value = 23 years). Visitors indicate less knowledge of places in the Otways than residents, with the majority expressing fair (45.5%) or good (34.3%) knowledge of the Otways. We note that the measure of Otways knowledge in the survey was a subjective, self-reported item that cannot be independently validated. Further, most respondents have visited the Otways more than 10 times (46.0%); however, a high proportion visited less than 3 times (31.8%).

In summary, respondent characteristics indicate some bias toward older, more educated, and knowledgeable Otways residents. While sample deviations from true population characteristics are generally viewed negatively, this bias can be placed in a positive light because greater knowledge and experience about the Otways likely increases the reliability of the mapping component of the survey.

Chapter 4

LANDSCAPE VALUES AND DEVELOPMENT PREFERENCE ANALYSIS

Landscape values and development preferences provide the core data for this study. For the past six years, Brown (2005) has included spatial measures of perceived landscape values and other place attributes in five separate surveys of the general public in Alaska, and one study on Kangaroo Island, South Australia (Brown & Hale 2004), with the goal of systematically integrating local knowledge with biophysical landscape information.

The process of using public landscape values to determine their consistency with potential land uses has been called Values Suitability Analysis (VSA) and was first applied by Reed and Brown (2003) in the Chugach National Forest (US) planning process in Alaska.

In the Otways study, we used a number of techniques to display and analyse the spatial data. In this chapter, four techniques are described and presented: 1) descriptive mapping; 2) proportionate analysis; 3) simple raster modelling; and 4) predictive modelling. The latter method uses discriminant analysis of the landscape values to discriminate between the current land classifications (national park, state forest and private land) to determine whether proposed land classifications are consistent with perceived landscape values for the particular land classification.

Descriptive Mapping of Landscape Values, Development Preferences and Special Places

Once the respondent point data are digitised into a GIS, a large number of density maps ('grids' in GIS terminology) can be generated that show the spatial distribution of landscape values, development preferences and special places. Density maps are generated in ArcView® software by selecting a grid cell size and a search radius around each grid cell. For each landscape value or development preference, the number of points falling inside the grid cell and cells within the search radius will be totalled and divided by the area contained with the grid cell. The density maps reveal varying intensities of landscape values, development preferences and special places, and areas with especially high densities of points may be referred to as 'hotspots'.

The density maps are a very useful starting point to understand the spatial data. To illustrate their potential, density maps for aesthetic, recreation, life sustaining, spiritual and biological diversity values appear as Appendices D, E, F, G and H. Aesthetic values are distributed extensively along the entire Otways coast with hinterland hotspots located at Melba Gully, Triplet Falls and Lake Elizabeth. Recreation values are somewhat more concentrated than aesthetic values with peak densities located at Apollo Bay, Lorne and Glenaire. Life sustaining values are primarily distributed in the hinterland with hotspots located at Olangolah Reserve, Otway National Park, Otway State Forest near Lake Elizabeth, Carlisle State Park and Angahook/ Lorne State Park. Spiritual values are distributed along the Otways coast with hinterland hotspots similar to aesthetic values. Finally, biological diversity values are distributed along the coast and within existing national parks, state parks and reserves. We also mapped resident economic, wilderness, future, intrinsic, knowledge, therapeutic and heritage values, as well as special places for the Otways region. These density maps appear as Appendices I, J, K, L, M, N, O and P, respectively.

Landscape Values and Development Preferences in Current and Proposed Public Land Classifications

The relative proportion of landscape values and development preferences located inside and outside the current and VEAC proposed land classifications appears in Table 11. Under current land classifications, proportionately more biological diversity, future, learning values and no development preferences are located inside the current national park boundaries, (chi-square, $p < 0.05$). However, there are no differences in the proportion of each of these values and preferences for the VEAC expanded national park, indicating that the proposed national park encapsulates a greater proportion of non-use values. Further, there are no differences in the proportion of intrinsic, life sustaining, spiritual, therapeutic, wilderness, special place and heritage values, as well as residential and tourism development preferences, located inside and outside current and proposed VEAC land classifications.

Proportionately more economic values are located in current state forests, but this value is replaced with proportionately more recreation values in the proposed forest park (chi-square, $p < 0.05$). This value shift

suggests that residents identify with the recreation focus of the proposed forest park designation (VEAC 2004) with decreased reliance on economic outputs such as timber harvesting.

Overall, the public distinction in landscape values between national parks and forest parks is not large and this distinction is likely to be further blurred under the VEAC proposal to expand national park lands at the expense of state forest lands.

Table 11: Similarities and differences in distribution of landscape values inside and outside Otways national parks, defined under current and proposed land classification

Current Land Classifications	VEAC Proposed Land Classifications
Inside National Park[1]	
Biological Diversity (8.4% vs. 6.5%)	Aesthetic (11.3% vs. 8.8%)
Future (6.9% vs. 5.7%)	
Learning (7.4% vs. 5.7%)	
No development (9.9% vs. 8.3%)	
Outside National Park (Forestry land)	
Economic (3.5% vs. 1.9%)	
	Recreation (11.1% vs. 6.4%)
No difference[2]	
Aesthetic (10.3% vs. 9.0% more outside)	
Intrinsic (5.9% vs. 5.0% more outside)	Intrinsic (5.4% vs. 5.2% more outside)
Life sustaining (10.2% vs. 8.9% more outside)	*Life sustaining (8.5% vs. 7.4% more inside)*[3]
Recreation (7.1% vs. 7.0% more outside)	
Spiritual (4.0% vs. 4.2% more outside)	*Spiritual (4.1% vs. 3.6% more inside)*
Therapeutic (5.9% vs. 5.7% more outside)	Therapeutic (6.9% vs. 5.7% more outside)
Wilderness (10.3% vs. 9.5% more outside)	*Wilderness (9.3% vs. 9.2% more inside)*
Special places (9.0% vs. 8.2% more outside)	*Special places (10.0% vs. 9.7% more inside)*
Heritage (4.1% vs. 3.8% more inside)	Heritage (6.3% vs. 5.0% more inside)
	Biological diversity (6.2% vs. 5.4% more inside)
	Future (5.5% vs. 5.4% more inside)
	Learning (5.5% vs. 5.5%)
	Economic (3.4% vs. 3.2 % more inside)
	No development (8.7% vs. 8.3% more inside)
Residential development (1.0% vs. 1.0%)	Residential development (1.3% vs. 1.0% more outside)
Tourism service development (1.3% vs. 1.2% more outside)	Tourism service development (1.9% vs. 1.5% more outside)
Tourism accommodation development (1.2% vs. 1.5% more inside)	Tourism accommodation development 1.8% vs. 1.5% more outside)

[1] Inside and outside classifications represent statistically significant differences in value proportions (χ^2, $p < 0.05$).

[2] 'No difference' indicates landscape value proportions inside vs. outside national parks are not statistically significant (χ^2, $p > 0.05$), but the relative abundance of values inside/outside is noted.

[3] Italicised values indicate a change from being 'more outside' current national parks to being 'more inside' proposed national parks.

Landscape Values and Development Preferences for Public vs. Private Lands

The proportional differences for landscape values and development preferences held for public versus private lands are striking (Table 12). Proportionately more aesthetic, biological diversity, future, intrinsic, learning, life sustaining, spiritual, therapeutic, wilderness values and 'no development' preferences are located inside public lands, (chi-square, $p < 0.05$), while proportionately more economic and heritage values and residential and tourism development preferences are located on private lands. The large differences in values between public land and private land classifications enhance discriminant analysis and the prediction of future national park boundaries, as will be described later.

Table 12: Similarities and differences in distribution of landscape values inside/outside public lands

Inside Public Lands[1]
Aesthetic (9.6% vs. 7.8%)
Biological Diversity (7.7% vs. 3.8%)
Future (6.4% vs. 4.0%)
Intrinsic (5.4% vs. 3.7%)
Learning (6.7% vs. 3.6%)
Life sustaining (9.5% vs. 2.9%)
Spiritual (4.1% vs. 3.5%)
Therapeutic (5.8% vs. 3.9%)
Wilderness (9.8% vs. 3.0%)
No development (9.3% vs. 5.8%)
Outside Public Lands (private lands)
Economic (9.2% vs. 2.6%)
Heritage (6.1% vs. 4.0%)
Residential development (8.8% vs. 1.0%)
Tourism accommodation development (8.7% vs. 1.4%)
Tourism service development (9.0% vs. 1.2%)
No difference[2]
Recreation (7.6% vs. 7.1% more private lands)
Special places (8.6% vs. 8.6%)

[1] Inside and outside classifications represent statistically significant differences in value proportions (χ^2, $p < 0.05$).

[2] 'No difference' indicates landscape value proportions inside vs. outside public lands are not statistically significant (χ^2, $p > 0.05$) but the relative abundance of values inside/outside is noted.

Simple Modelling of Tourism Development Preferences

To model development preferences for the Otways region, the density grid representing no development preferences was mathematically subtracted from each of the density grids representing tourism and residential development preferences. The result is a new grid map with grids cells that reflect the difference between acceptable development and no development point densities. The difference may be considered a 'development index' that ranges on a continuum from acceptable development preferences (positive values) to inappropriate development preferences (negative values). A transparent decision rule can be adopted about the public acceptability of future development options based on different 'development index' values. For purposes of illustration, a simple decision rule and set of maps is presented herein showing both resident (Appendix Q) and visitor (Appendix R) preferences. Where the development index goes negative, the type of development represented by the index should be discouraged as a matter of local government policy and where the

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development index is positive, the type of development represented by the index should be encouraged. Development index values close to zero represent land areas with public ambivalence toward the general type of development being analysed, either tourism or residential development.

A simple model of resident tourism development preferences (Appendix Q) indicates that the tourism nodes proposed in the Otway Hinterland tourism plan span both high density acceptable development and high density inappropriate development zones. For example, the Forrest, Barwon Dam and Lake Elizabeth tourism node spans from the community of Forrest (acceptable development) to Lake Elizabeth (inappropriate development); likewise, development appears more acceptable around the township of Lavers Hill than the destination attraction of Melba Gully. Visitor development preferences (Appendix R) closely track those of residents except for obvious preferences for tourism development (green densities) along the coast. These findings indicate that both resident and visitors would prefer that future tourism development occur within existing townships, and the tourism development nodes proposed in the Otway Hinterland tourism plan, as drawn in the plan, would enjoy only limited public support.

Modelling of National Park/Forest Park Classifications

There is ample evidence that people can and do differentiate between some public lands (e.g., national parks) and private lands. This section describes a procedure to assess whether publicly held landscape values can be used to describe and differentiate between land classifications; for example, national parks from state forests and private lands. If the Otway National Park is to be expanded, are the new proposed lands to be included the best choices? Discriminant analysis is a statistical procedure that separates objects into their known classified groups based on a linear combination of predictor variables, often object attributes. In this case, discriminant analysis produces a classification table that describes how 'successful' the predictor variables (landscape values) discriminate between the different land classifications (national park, state forest and private land).

The discriminant analysis described herein uses both vector and raster data derived from the respondent mapped landscape values. Vector data models define space as a series of points, lines or polygon units geographically referenced by Cartesian coordinates (Burrough & McDonnel 2000). Conversely, raster data models consist of a regular grid, each defined by XY coordinates. The major advantage of raster models is that each cell has a similar and regular shape, enabling individual pixel analysis and more powerful map algebra (Star & Estes 1990).

The vector analysis involved digitising eight polygons of similar area from different Otways land classifications: current state forest, current national park, VEAC proposed national park expansion areas and private land. We extracted the type and frequency of landscape values held for each polygon from the GIS, and landscape values were classified as either being 'inside the current national park', 'inside the current state forest', 'inside private land' or inside 'proposed national park'. We only selected landscape values from mutually exclusive land designations (e.g., values held for current national parks were not included in the proposed national park designation) to reduce within group variance. The landscape values and their classification codes were imported into SPSS for discriminant analysis.

The raster analysis involved converting the current national park, current state forest and proposed national park into grid themes using a 500 m grid cell size. We assigned three public land designations (n = 5250 grid cells) a unique identifier for each land classification. We coded the remaining area of the Otways as private land and then randomly sampled to generate a comparable number of grid cells (n = 1750) for analysis with the public land classifications. The 12 landscape values were also converted into grid themes using a consistent cell size of 500 m and 2 km search radius prior to merging with the land classification database. With land classification (national park, forest park and private land) as the dependent variable, the 12 landscape values were entered as predictor variables into the discriminant analysis.

Table 13 (a) shows the statistics from the discriminant analysis of both the vector and raster models. The Eigen values, statistics that quantify variation in a group of variables as explained by a particular function (Field 2000), are converted into percentage of variance accounted for. In both the vector and raster models, the first function accounts for > 81.2% of the variance compared to the second function which accounts for < 18.8% of the variance. The next part of the table shows Wilks' lambda which represents the ratio of error variance to total variance. Large Eigen values lead to small values of Wilks' lambda and statistical significance (Field 2000). In the vector model, only the first discriminant function is significant ($p < 0.05$), whereas in the raster model both functions are significant.

The relative contributions of each variable to the functions appear in Table 13 (b). For the vector model, aesthetic (1.212) and economic (1.203) values are the largest contributors to the first discriminant function, based on standardised discriminant function coefficients, and for the raster model, biological diversity (0.619) and wilderness (0.443) values are the largest contributors. Future value (-0.014) is a minor contributor in the vector model while heritage (0.004) and recreation (-0.072) values are minor contributors in the raster model.

The correlations between the predictor variables and the discriminant functions appear in Table 13 (c). The direction of the correlations suggests the functions are discriminating based on direct versus indirect human uses

of the landscape. For example, the negative correlations for the vector model represent indirect or less tangible landscape values – wilderness (-0.429), biological diversity (-0.307), life sustaining (-0.379), learning (-0.230), intrinsic (-0.269) and future (-0.107) values while the positive correlations represent more direct human uses of the landscape – economic (0.681) and recreation (0.211) values in particular. The discriminant functions evaluated at group centroids [Table 13 (d)] suggest indirect use values align with national park land whereas direct use values align with private land. The raster model interpretation in Table 13 (c) is less clear, although economic value (-0.004) appears opposite to the other landscape values.

The classifications results [Table 13 (e)] show that the raster model has less discriminating power than the vector model (61.7 vs. 87.5%), but when used to predict group membership, has more cross-validation power (61.5%50.0%). The centroid positions of the public and private lands do not change in the vector and raster models [Table 13 (d)]. National park allocations align with indirect uses of the landscape, private land allocations align with direct uses, and state forests are positioned somewhere in between these extremes. The distinctions between state forests, national park and private lands are not as clear in the raster model, shown by smaller differences between land allocation centroids. In the raster model, state forest is closer to private land than national park, whereas in the vector model, state forest is closer to national park than private land.

The vector model classification results indicate that one polygon of state forest was incorrectly classified as national park, one polygon of national park land was incorrectly classified as state forest, and one polygon of private land was incorrectly classified as national park, yielding 87.5% accuracy overall [Table 13 (e)]. The vector model also suggests that the eight unclassified polygons are best characterised as state forest (3 polygons), national park (4 polygons) and private land (1 polygon).

In contrast, the raster model incorrectly predicted 70 state forest grid cells as national park, 527 national park grid cells as state forest and 68 private land grid cells as national park, yielding 61.7% accuracy. Further, of the ungrouped grid cells, 2 768 would be classified as state forest, 1 210 as national park, and the remaining 12 442 cells as private land.

Table 13: Discriminant analysis results for three groups – 1) Current State forest; 2) Current National Park; 3) Private Land, based on landscape values analysed as vector and raster data

(a) Canonical discriminant functions

Vector							
Function	Eigenvalue	% variance	Canonical correlation	Wilks' lambda	χ^2	d.f.	p
1	3.856	81.2	0.8911	0.109	35.49	22	0.034
2	0.892	18.8	0.6867	0.529	10.20	10	0.423
Raster							
Function	Eigenvalue	% variance	Canonical correlation	Wilks' lambda	χ^2	d.f.	p
1	0.448	92.1	0.5564	0.665	2132.44	22	0.000
2	0.038	7.9	0.192	0.963	196.33	10	0.000

(b) Standardised discriminant function coefficients

	Vector	Raster
Variable	Function 1	Function 1
Aesthetic	1.212	-0.372
Economic	1.203	-0.182
Recreation	0.412	-0.072
Life sustaining	0.647	0.247
Learning	0.477	0.258
Biological diversity	0.383	0.619
Spiritual	1.047	0.285
Intrinsic	0.558	-0.116
Heritage	0.763	0.004
Future	-0.014	-0.298
Therapeutic	-0.357	b
Wilderness	a	0.443

(c) Structure matrix for pooled within-groups correlations between discriminating variables and standardised canonical discriminant functions

Vector		Raster	
Variable	Function 1	Variable	Function 1
Economic	0.681	Wilderness	0.896
Wilderness	-0.429	Biological diversity	0.838
Biological diversity	-0.307	Life sustaining	0.734
Spiritual	0.276	Learning	0.725
Learning	-0.230	Intrinsic	0.669
Aesthetic	0.200	Future	0.643
Life sustaining	-0.379	Spiritual	0.506
Recreation	0.211	Heritage	0.499
Intrinsic	-0.269	Therapeutic	0.499
Heritage	0.250	Aesthetic	0.415
Future	-0.107	Economic	-0.004
Therapeutic	0.017	Recreation	0.099

(d) Canonical discriminant functions evaluated at group means (centroids)

	Vector	Raster
Group	Function 1	Function 1
1. Current State Forest	-1.088	-0.345
2. Current National Park	-1.499	0.939
3. Private Land	2.587	-0.588

(e) Classification results

		Vector				Raster		
		Predicted group membership				Predicted group membership		
Actual group	N	1	2	3	N	1	2	3
1. Current State Forest	8	7	1	0	1747	858	70	819
		(87.5%)	(12.5%)	(0%)		(49.1%)	(4.0%)	(46.9%)
	8	1	7	0	1737	527	905	305
		(12.5%)	(87.5%)	(0%)		(30.3%)	(52.1%)	(17.6%)
3. Private Land	8	0	1	7	1750	216	68	1466
		(0%)	(12.5%)	(87.5%)		(12.3%)	(3.9%)	(83.8%)
4. Ungrouped Cases	8	3	4	1	16420	2768	1210	12442
		(37.5%)	(50.0%)	(12.5%)		(16.9%)	(7.4%)	(75.8%)

Percent of cases correctly classified: Vector = 87.5%, Raster = 61.7%

Percent of cases correctly cross-validated: Vector = 50.0%, Raster = 61.6%

Spatial Distribution of Predicted National Parks

The spatial distribution of national park classifications, as predicted by the discriminant analysis for the raster model, is presented in Appendix S. The value-based national parks appear to closely track the expert-defined boundaries of the current national park and also include areas contained within the national park expansion. Although not perfect, the landscape values expressed by Otway region residents appear to confirm the national park status of both the old Angahook-Lorne State Park (2) and the old Otway National Park (6 and 12), as well as support conversion of a significant proportion of the Otway State Forest (3 and 8) into new national park land. Land not located in the expanded national park includes the Anglesea Heathland (1), camping sites along the Gellibrand River (4) and the Marengo Conservation Park (5). These results present an opportunity for government agencies to review the present classification and management of these lands because they hold values consistent with national park status.

The incorrect classification of national parks into state forests and private lands also warrants explanation. Visual inspection of maps not included in the results suggest that the majority of national park grid cells incorrectly classified as state forests encroach the boundaries of the national parks; an exception being the north-eastern sector of the Angahook-Lorne State Park where state forests envelop a large portion of the land area. The majority of national park grid cells incorrectly classified as private land grid cells are located around coastal townships and tourist attractions, in particular Aireys Inlet, Lorne and Cape Otway Lighthouse Station.

Chapter 5

PLACE ATTACHMENT AND ENVIRONMENTAL VALUATION

The Otways study provided an opportunity to examine some of the dimensions of place attachment in Australia and to explore potential relationships between place attachment and perceived landscape values. In this chapter, we present the results of three research objectives: (1) to determine whether place identity and place dependence emerge as distinct constructs in Australia; (2) to identify which independent (respondent) variables are most predictive of place attachment; and (3) to determine which landscape values are most predictive of place identity and place dependence.

The emergence of ecosystem management has required a new way of valuing natural resources (Manzo 2003) that accounts for the values people associate with places or landscapes (Williams & Patterson 1996; Brown 2005), and the personal bonds people form with them (Williams & Vaske 2003). Sense of place has been the focus of studies in the geographical sciences (Kaltenborn & Williams 2002) and refers to the attachment or emotional bond people have with place (Altman & Low 1992; Williams & Stewart 1998) or the meaning one attributes to such areas (Relph 1976; Fishwick and Vining 1992; Kaltenborn 1998; Stedman 2003). According to Williams and Vaske (2003), place attachment is the environmental psychologist's equivalent of the geographer's sense of place. When used broadly, it refers to the positive emotional bonds that develop between individuals and their environment (Altman & Low 1992; Williams, Patterson, Roggenbuck, and Watson 1992; Moore & Graefe 1994).

Williams and Vaske (2003) suggest that place bonds can be systematically identified and measured using a two-dimensional structure of place attachment based on place identity and place dependence. Place identity refers to the mixture of feelings about specific physical settings and types of settings (Proshansky, Fabian & Kaminoff 1983) and how these settings provide meaning and purpose to life (Williams & Roggenbuck 1989; Shamai 1991; Giuliani & Feldman 1993). Conversely, place dependence refers to connections based specifically on activities that take place in a setting, reflecting the importance of a place in providing conditions that support an intended use (Schreyer, Jacob & White 1981), such as timber harvesting or horse-riding, as well as the ability for the area to adequately provide for that use (Jacob & Schreyer 1981). Kyle and his colleagues (Kyle, Absher & Graefe 2003; Kyle, Graefe, Manning & Bacon 2004) have applied both place identity and place dependence measures and found that they were suitable predictors of resource conflicts, such as attitudes towards fee programs and overcrowding on public lands.

While these scales are useful in predicting resource conflicts, there is a need to develop analytic tools that can address the geographic dimensions of place more directly (Dixon & Durrheim 2000; Stedman 2003). Research in the Lake District of Northern Wisconsin, USA, demonstrated that landscape attributes were important to constructed place meanings, and these meanings were not exclusively social (Stedman 2003). In response, Brown (2005) proposed a methodology for linking place attachment to survey responses measuring place-specific landscape values. One unexamined aspect of the spatial mapping approach is the identification of the landscape values that are most effective predictors of place identity and place dependence. One might speculate that indirect use values (e.g., ecological or future values) would be more predictive of place identity while more direct use-values (e.g., recreation and economic values) would be more predictive of place dependence.

The Otways survey contained 15 place attachment statements taken from studies that previously demonstrated good internal consistency (Jorgensen & Stedman 2001; Williams & Vaske 2003). Of these, we used six items to represent place identity and five items to represent place dependence. We then presented the survey items on a 5-point Likert scale where '1 = Strongly Agree', '5 = Strongly Disagree' and '3 = Neither Agree or Disagree'. Respondents were also asked to identify the community where they live, their knowledge of the Otways region, length of residence, and whether they saw themselves as an advocate for the environment.

We tested the hypothesis about the relationship between landscape values and levels of place attachment using multiple regression analysis. Each of the 12 landscape values had six mnemonically coded sticker dots with varying importance ratings ranging from 5 to 50 points with the total number of points equalling 100. Survey participants could place any combination of landscape value sticker dots on the enclosed Otways map to indicate both the location and the importance of the value. Therefore, importance scores for each landscape value could range from 0 to 100 depending on the number of dots placed on the map.

In the multiple regression models, we treated the landscape value importance scores for each resident and visitor respondent as independent variables and the mean scale scores for place identity and dependence as dependent variables. We placed all landscape values into the regression models and included the variance inflation factor (VIF) collinearity diagnostics to assess the extent to which predictor variables were interrelated.

Generalisability of Place Identity and Place Dependence Constructs in Australia

Confirmatory factor analysis demonstrates an acceptable fit for the place identity and place dependence constructs for all Otways respondent groups - residents, visitors, and the three resident subgroups (coast, hinterland and plains). On the construct of place identity, resident factor loadings for the place identity dimension ranged from 0.61 to 0.86, and visitor responses ranged from 0.70 to 0.87 (Table 14). The factor loadings were similar for coastal, hinterland and plains residents (range = 0.56 to 0.89).

All items for the place dependence construct followed a pattern similar to the place identity statements. For visitors, factor loadings ranged from 0.66 to 0.83 and for residents 0.67 to 0.87. Again, the factor loadings were similar for coastal, hinterland and plains residents (range = 0.61 to 0.88).

The high Cronbach's alpha scores (> 0.89), a form of reliability analysis, indicate that the individual survey items are cohesive and contribute to identifying the overarching constructs of place identity and place dependence.

Table 14: Reliability and confirmatory factor analyses of place identity and place dependence items for residents and visitors, including subregions of residence

Place attachment items	Residents (n = 522)	Visitors (n = 199)	Coastal Residents (n = 168)	Hinterland Residents (n = 116)	Plains Residents (n = 238)
Place identity					
I feel the Otways are a part of me	0.78	0.78	0.83	0.75	0.76
The Otways are very special to me	0.86	0.84	0.86	0.86	0.86
I identify strongly with the Otways	0.86	0.87	0.85	0.82	0.89
I am very attached to the Otways	0.85	0.86	0.84	0.79	0.88
Living in the Otways says a lot about who I am	0.61	0.70	0.56	0.66	0.60
The Otways mean a lot to me	0.84	0.85	0.85	0.86	0.83
Cronbach's alpha (place identity)	**0.93**	**0.93**	**0.92**	**0.92**	**0.94**
Place dependence					
The Otways are the best place for what I like to do	0.67	0.66	0.73	0.61	0.64
No other place can compare to the Otways	0.79	0.79	0.81	0.73	0.78
I get more satisfaction out of living in the Otways than any other place	0.76	0.83	0.76	0.78	0.77
Doing what I do in the Otways is more important to me than doing it in any other place	0.85	0.82	0.83	0.83	0.87
I wouldn't substitute any other area for doing the types of things that I do in the Otways	0.87	0.83	0.86	0.88	0.87
Cronbach's alpha (place dependence)	**0.90**	**0.89**	**0.89**	**0.89**	**0.90**
Cronbach's alpha (all items)	**0.94**	**0.92**	**0.92**	**0.93**	**0.94**

Relationships between Place Attachment and Respondent Variables

We examined relationships between place identity and place dependence and the respondent variables of length of residence, knowledge of the Otways region and advocacy for the environment. A three-way full factorial model determined potential interaction effects between respondent variables and place identity and place dependence; however, no interactions were statistically significant. The length of residence, knowledge and advocacy for environment factors only explained 23% of the variance in place identity and 10% of the variance in place dependence.

We measured the strength of the relationship between each respondent variable and place identity and dependence using Pearson's correlation coefficient for interval data (length of residence) and Spearman's coefficient for rank data (knowledge of region and environmental advocacy). For all analysis groups, respondents who expressed more knowledge of the Otways region had significantly higher place identity and place dependence than those who expressed less knowledge of the region ($r \geq 0.181$, $p < 0.05$). These relationships are stronger for place identity compared to place dependence, with the exception of hinterland residents (Table 15).

We also found significant, but weak, positive relationships between length of residence and place identity ($r \geq 0.143$, $p < 0.05$), and advocacy for the environment and place identity ($r \geq 0.150$, $p < 0.05$), with the exception of hinterland residents ($r \leq 0.133$, $p \geq 0.05$). Place dependence showed weaker, but still significant relationships, with length of residence and environmental advocacy than place identity.

Table 15: Relationships between place identity and dependence and respondent variables

	Residents		Visitors		Coastal Residents		Hinterland Residents		Plains Residents	
Variable	P.I.	P.D.	P.I.	P.D.	P.I.	P.D.	P.I.	P.D.	P.I.	P.D.
Length of residence (0-100 yrs) Pearson Correlation r	0.144**	0.110*	n/a	n/a	0.317***	0.218**	0.133	0.208*	0.143*	0.047
Knowledge of Otways (Excellent, Fair, Poor) Spearman Correlation r	0.392***	0.251***	0.428***	0.292*	0.374***	0.181*	0.213*	0.227*	0.484***	0.280***
Advocate for the environment (Yes, somewhat, no) Spearman Correlation r	0.328***	0.163**	0.291***	0.150*	0.278***	0.050	0.130	-0.042	0.419***	0.291***

*** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$
P.I. = Place Identity; P.D. = Place Dependence; n/a = not applicable for visitors
Place identity and place dependence items were based on a scale ranging from '1 = Strongly Agree',
'2 = Agree', '3 = Neither Agree or Disagree', '4 = Disagree' and '5 = Strongly Disagree'.

Associations between Place Attachment and the Intensity of Landscape Valuation

When we regressed landscape values against measures of place identity and dependence (Tables 16 and 17), spiritual value emerged as a significant positive predictor of both place identity ($t = 4.771$, $p < 0.05$) and place dependence ($t = 4.208$, $p < 0.05$), while intrinsic value was a significant but weak, negative predictor of place dependence ($t = -2.154$, $p < 0.05$). Spiritual values are clustered around the Otway Coast (see Appendix G), an area undergoing rapid tourism and residential development. The low standardised coefficients for the remaining landscape values suggests that respondents are expressing a mix of place identity and place dependence in landscape valuation that cannot be explained by the attachment items proposed by Williams and Vaske (2003).

Table 16: Linear regressions of the 12 landscape values against place identity

Model Results	R	R²	F	p		
	0.314	0.12	4.18	0.000		
	Place Identity[c]				Collinearity Statistics	
Independent Variables	Standardised Coefficients	t	p		Tolerance	VIF
Aesthetic[a]	-0.054	-0.945	0.345		0.717	1.394
Economic	0.011	0.177	0.860		0.586	1.707
Recreation	-0.019	-0.290	0.772		0.567	1.763
Life Sustaining	0.010	0.135	0.893		0.398	2.515
Knowledge	0.031	0.386	0.699		0.352	2.844
Biological Diversity	0.032	0.417	0.677		0.395	2.532
Spiritual	**0.318[b]**	**4.771**	**0.000**		0.522	1.917
Intrinsic	-0.083	-1.081	0.281		0.389	2.569
Heritage	0.028	0.376	0.707		0.411	2.434
Future	-0.139	-1.733	0.084		0.363	2.757
Therapeutic	0.053	0.689	0.492		0.386	2.588
Wilderness	0.093	1.300	0.194		0.451	2.216

[a] Landscape value importance scores range from 0 to 100, depending on the number of dots placed on the map. [b] Bold numbers indicate that the landscape value importance score is significantly associated with place identity ($p < 0.05$). [c] Place identity scores are based on summative scales.

Table 17: Linear regressions of the 12 landscape values against place dependence

Model results	R	R²	F	p		
	0.293	0.086	3.05	0.000		
	Place Dependence[c]				Collinearity Statistics	
Independent Variables	Standardised Coefficients	t	p		Tolerance	VIF
Aesthetic[a]	-0.074	-1.294	0.197		0.721	1.387
Economic	-0.015	-0.238	0.812		0.589	1.698
Recreation	-0.006	-0.098	0.922		0.564	1.772
Life Sustaining	-0.027	-0.344	0.731		0.396	2.522
Knowledge	0.059	0.720	0.472		0.353	2.835
Biological Diversity	0.064	0.835	0.404		0.397	2.516
Spiritual	**0.282[b]**	**4.208**	**0.000**		0.524	1.910
Intrinsic	**-0.167**	**-2.154**	**0.032**		0.390	2.565
Heritage	0.034	0.454	0.650		0.410	2.436
Future	0.012	0.146	0.884		0.358	2.796
Therapeutic	-0.057	-0.726	0.469		0.386	2.592
Wilderness	0.091	1.251	0.212		0.446	2.240

[a] Landscape value importance scores range from 0 to 100, depending on the number of dots placed on the map. [b] Bold numbers indicate that the landscape value importance score is significantly associated with place dependence ($p < 0.05$). [c] Place dependence scores are based on summative scales.

To summarise, the concept of place attachment separates into two factors (place identity and place dependence) with high factor loadings, supporting the findings of Williams and Vaske (2003). Results were similar for both resident and visitors suggesting the concepts of place identity and dependence extend beyond place of residence. These results indicate that visitors are also 'vested' in local development decisions, even those that may be seemingly unrelated to the visitor experience. Place identity and attachment are likely to be influenced by knowledge of the Otways region, length of residence and advocacy for the environment, among other respondent variables. The place identity and place dependence constructs are most closely associated with residents' spiritual values for the landscape (β place identity = 0.318, β place dependence = 0.282) suggesting a metaphysical dimension to place attachment. The stronger clustering of spiritual values along the coast, the most active region of tourism and residential development, suggests that spiritual value can be an important predictor of land-use conflict along with the more traditional predictors of land use conflict - the clash over aesthetic and recreation values.

Chapter 6

CONCLUSIONS AND RECOMMENDATIONS

Resident and Visitor Attitudes toward Tourism Growth and Development

Chapter 3 shows that Otways region residents and visitors are divided over threats posed by tourism to their quality of life or visitor experience. Overall, tourism has not changed the desirability of the Otways as a place to live or visit (52.8% indicated it has stayed the same), but more residents than visitors believe tourism has decreased the desirability of the region (26.6% vs. 16.1%). When analysing resident subgroups, more coastal residents believe that tourism has made the Otways a less desirable place (38.4%) compared to hinterland residents (22.9%), plains residents (17.1%) and visitors (16.1%).

Both residents and visitors oppose major hotels in Otways townships and fast-food outlets; however, there are conflicting attitudes toward harbour developments and commercial/retail centres. Residents mildly support harbour developments and commercial retail centres whereas visitors mildly oppose these developments. We found some differences among subregions of residence in attitudes toward harbour developments, with coastal residents significantly more opposed to this type of development than plains residents.

For hinterland tourism, proportionately more Otways region residents prefer a higher level of tourism development compared to visitors to the region, but both groups support slow growth, defined as +1% per annum, over any other growth type. All resident subgroups feel the current level of hinterland tourism development is about right, and support slow visitor growth over any other growth type.

Both residents and visitors expressed more negative attitudes toward tourism growth and development along the Otway Coast compared to the Otway Hinterland. Along the coast, 43.0% of residents perceive the current level of tourism development as too much compared to 10.1% for the hinterland. This view is shared by visitors to the region (39.8% coast vs. 7.5% hinterland). A higher proportion of residents and visitors also prefer no growth (defined as 0% per annum) along the coast (30.8% and 35.6%, respectively) compared to the hinterland (24.6% and 28.9%). These findings indicate that there is greater support among residents and visitors for Otway Hinterland tourism development compared to Otway Coast tourism development; however, tourism planners must be cautious about the rate of tourism growth in the Otway Hinterland. The promotion of fast growth (+5% annual change) may reduce support for tourism activities and compromise hinterland tourism experiences.

Unlike traditional survey research methods, the spatial attribute method recognises that there are place-specific differences in tourism development preferences. Both residents and visitors expressed strong support for development in the Forrest (96.0% and 76.0% acceptable) and Beech Forrest townships (94.6% and 88.5% acceptable) with opposition to tourism development at nature-based attractions including the Otway Fly, Triplet Falls and Victree node (69.8% and 63.4% inappropriate); Lake Elizabeth (86.8% and 66.7% inappropriate); and Olongalah Flora and Fauna reserve (97.7% and 86.7% inappropriate).

Simple modelling of resident and visitor tourism development preferences (chapter 4) indicate that the tourism nodes proposed in the Otway Hinterland tourism plan span both high density acceptable development and high density inappropriate development zones. For example, the Forrest, Barwon Dam and Lake Elizabeth tourism node spans from the township of Forrest (acceptable development) to the tourist attraction of Lake Elizabeth (inappropriate development); likewise, development appears more acceptable around the township of Lavers Hill than the destination attraction of Melba Gully. These findings indicate that both resident and visitors would prefer that future tourism development occur within existing townships, and the tourism development nodes proposed in the Otway Hinterland tourism plan, as drawn in the plan, would enjoy only limited public support. We recommend that DSE, in consultation with key tourism stakeholders, review the scale and location of the tourism nodes prior to developing tourism accommodation and services.

On a wider level, the spatial mapping technique presented in this paper is important for land use planners who are facing place-specific development issues. A transparent decision rule can be adopted about the public acceptability of future development options based on different 'development index' values. Where the development index goes positive (green), tourism development nodes or council areas can accommodate further development, and where the development index goes negative (red), these areas should be zoned for conservation, either short or long-term.

Perceived Threats to Quality of Life or Visitor Experience

The largest perceived threat in the Otways region is from the loss of coastal scenery, followed by state forestry decisions and visitor/tourist behaviour (Chapter 3). From a resident perspective, decisions about land development by local government and resource management decisions by state agencies pose the greatest threats

to resident quality of life. Residents disagree with two items posing a threat - the quality of education and the prescribed burning of forest areas. Coastal residents perceive increased visitation, increased number of residents, loss of coastal scenery and vegetation clearing (for agriculture or housing) as greater threats to their quality of life than hinterland and plains residents.

Similar to resident perceptions, the greatest potential threats to the visitor experience are decisions that involve land use or resource management decisions, with the loss of coastal scenery and vegetation clearing posing the greatest threats and prescribed burning posing the least threat to the visitor experience. These findings support the need for continued prescribed burning within both the Great Otway National Park and Otway Forest Park, and a reassessment of the type and scale of developments permitted along the Otway Coast.

Attitudes Toward Otways Forestry

Residents and visitors have differences in opinion on Otways forest management (chapter 3). Forestry plantations are favoured on private lands by both residents and visitors, but residents view private plantations as more favourable (68.6% vs. 61.6%). More residents also favour plantations on public lands (45.0%) than oppose them (37.8%), but visitors are less favourably inclined toward public land forest plantations with 27.0% favouring and 46.4% opposing. Hinterland and plains residents generally favour logging of native forests up to 2008 (48.4% and 49.9% favour, respectively) whereas coastal residents and visitors oppose the practice (55.8% and 77.3% oppose, respectively). The logging of native forests after 2008 is strongly opposed by visitors (81.5%) and more moderately opposed by residents (52.0%). It seems reasonable to conclude that the majority of residents and visitors support the Victorian Government's commitment to cease logging of native forests in the Otways region by 2008.

Appropriate Activities for National Parks and Forest Parks

Chapter 3 highlights appropriate activities for proposed national parks and forest parks. Both residents and visitors agree (mean values < 3) that horse riding and mountain-biking on formed tracks, recreational fishing, nature study/wildlife observation, picnicking, walk-in camping, vehicle-based camping, bushwalking and commercial tour operations are appropriate activities in the proposed Great Otway National Park. Residents disagree (mean > 3) that livestock grazing, mining and timber harvesting are appropriate in either public land classification. In general, the types of activities that are appropriate for a national park are also appropriate for a forest park with one notable exception: where the mean value switched from appropriate (score < 3) to inappropriate (score > 3). Four-wheel driving on formed track is considered marginally appropriate in the proposed forest park land, but not in the proposed national park. This mean cross-over emphasises the need to carefully monitor and evaluate the public lands open to four-wheel driving.

Modelling of National Park/Forest Park Classifications

Chapter 4 shows that Otways region residents hold different mixes of values for national parks, state forests and private lands, and that these differences could be used to assess and revise national park allocations. In the vector model, respondents hold more indirect or less intangible values for national park land, including wilderness, biological diversity, life sustaining, learning, intrinsic and future values, but hold more direct use values for private lands, in particular recreation and economic value. In the raster model, the distinction between indirect and direct use values for protected areas is not as clear, which may relate to how people view landscapes.

A visual inspection of the predicted land classifications suggests that the transfer of state forests to a Great Otway National Park, as proposed by VEAC and legislated by the Victorian Parliament, is consistent with resident held landscape values. The value-based national park supports the VEAC's proposal to incorporate a large portion of the Otway State Forest into the Great Otway National Park, and when combined with biological assessments, can strengthen protected areas planning and management.

This report also indicates that by soliciting empirical observations about what and where humans value in regional landscapes, policymakers can develop plans that are consistent with human values for the landscape. Policy recommendations resulting from these value-based models are more likely to be recognised and implemented by local people who have been actively involved in the research process.

Further, the move toward integrated natural resource management in Australia demands a way of linking community values of landscapes with the values of institutions, government and business. Although the community is recognised as a vital link in effective resource management, policy frameworks have focussed on institutional reform and largely neglected community values for natural resources and their management (Paton, Curtis, McDonald & Woods 2004). Chapter 4 highlights that the mapping of landscape values can be used to assess options for the planning and management of conservation areas that is both inclusive and scientifically defensible.

Place Attachment and Environmental Valuation

In Chapter 5, we validate a two dimensional scale of place attachment (Williams & Vaske 2003) in an Australian resource setting and examine the relationships between landscape values and place attachment. High factor loadings and Cronbach's alphas support two dimensions of place attachment, namely place identity and place dependence. Regression analysis shows a significant 'signal' about the relationship between place attachment and spiritual landscape values. Spiritual values cluster around the Otway Coast, the most active region of tourism and residential development, suggesting that spiritual values will be inextricably linked with land-use conflict – even stronger than more traditional predictors of land use conflict, such as between aesthetic and recreation values.

Further, spiritual values for the landscape may be a reasonable proxy for place attachment, and when combined with the spatial mapping technique on a representative regional population, will yield maps that delineate priorities for managerial attention. The type of managerial action should acknowledge the spiritual bonds that people form with a landscape, which are rooted in place, and that symbol management may be as important as land management.

Usefulness of This Research Method

The spatial survey methodology will be useful for natural resource management and tourism planning agencies who aspire to engage both individuals and communities in resource management. At Commonwealth and State planning levels, for example, there is an increasing awareness of the social foundations of natural resource management and the need to develop analytic tools which foster: (1) a shared NRM vision and ownership at the regional level; and (2) partnerships between government and regional organisations that are underpinned with trust and confidence. In response to this need, we recommend that the spatial survey methodology be applied to mapping socioeconomic values in each of the 60 NRM regions in Australia. The maps will provide an important baseline for the monitoring and evaluation of community capacity building, institutional reform and community engagement strategies. New goals, targets and indicators can be developed during plan review to address the disagreement between institutional and community values for the landscape.

The methodology has important implications for tourism destination planning in Australia and elsewhere. We recommend that the methodology be applied to the mapping of tourism and conservation values on River Murray protected land. Maps will be able to delineate areas strongly valued for conservation and development purposes, enabling government agencies to prioritise which services and infrastructure it develops, maintains or downgrades along the River Murray. VEAC has already made a commitment to map landscape values along the Victorian section of the River Murray and we would encourage South Australian and New South Wales Governments to adopt a similar approach, thereby facilitating integrated resource management.

The spatial survey methodology will enable the assessment and revision of national park lands in Australia and elsewhere. In this study, discriminant analysis differentiated between national parks, state forests and private lands based on a typology of 12 landscape values. A visual assessment of national park classifications, as predicted by the discriminant analysis for the raster model, indicates moderate alignment between value-based national parks and national parks developed through biological assessment. The maps also identify areas of disagreement between community and expert values for national parks, and thus areas to target community engagement strategies.

We also acknowledge a variety of other applications for the spatial attribute methodology which include but are not limited to:
- Identification and integration of Indigenous Peoples' values into natural resource management policy.
- Planning and review of urban and regional land use zonings, including commercial, industrial, residential, watershed protection and conservation zones.
- Assessment of property turnover in Australia, including the values held by those landowners leaving, staying and arriving on the farm, and how these differing values influence land management practices.

Appendix A: Resident Survey

Mapping the future of the Otways region

Colac

Anglesea

Lorne

Gellibrand   Forrest

Beech Forest

Lavers Hill

Apollo Bay

Cape Otway

Rufous Bristlebird (Otways)
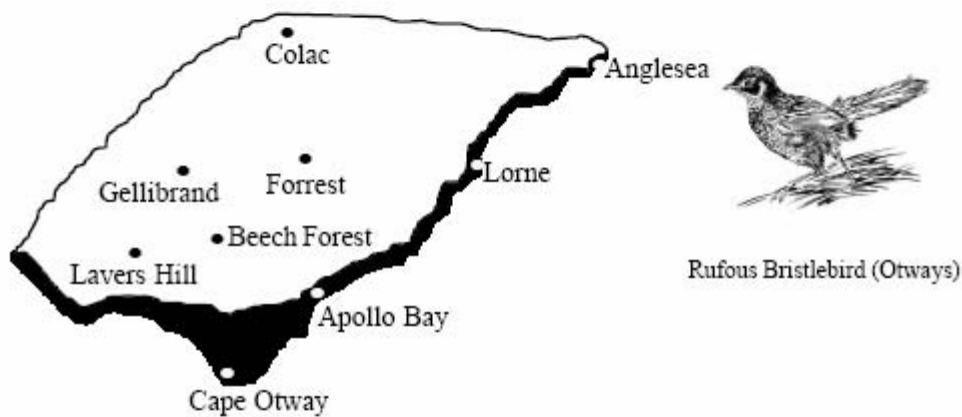
A Survey of Otways Region Residents: Your views are <u>important</u>!

Please return your completed questionnaire and map
in the enclosed envelope to:

Dr. Greg Brown   Mr. Chris Raymond
School of Natural and Built Environments
University of South Australia
Mawson Lakes Campus
Mawson Lakes, SA 5095

As a resident of the Otways region, you may well have a personal interest in its future. This survey asks what you value about the Otways and what you would like (or not like) to see changed in the area.

Several places in the survey refer to the Otways region. This region includes both the Great Ocean Road (Coast) and Otways Hinterland. See map below.
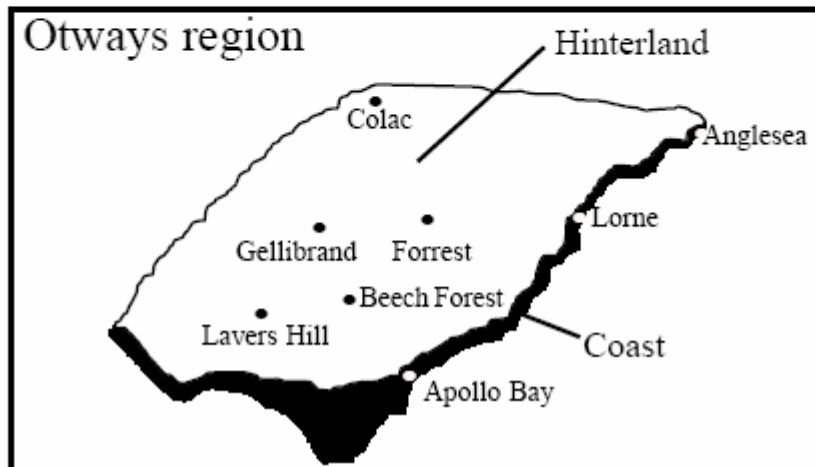
Otways region

Hinterland

Colac

Anglesea

Lorne

Gellibrand   Forrest

Beech Forest

Lavers Hill   Coast

Apollo Bay

Information collected from this survey will be made available to planning organisations such as Parks Victoria, Department of Sustainability and Environment, Victorian Environmental Assessment Council, Colac-Otway Shire, Surf Coast Shire and any Otways resident interested in the results. This survey is an important opportunity for you to express your future vision for the Otways region.

Please complete as much of the survey as possible. If a question is not clear, simply go to the next question. *The most important part to complete is Part 6 where you identify the places you value in the Otways*. We have provided a postage-paid envelope to return the survey and map.

We appreciate your participation in this study.

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Please note: While your opinions expressed in this survey will be presented to government agencies, the results may not change any previous government decision or influence future agency direction for the Otways region.

- 1 -

PART 1. Your familiarity and attachment to the Otways region

Q-1. About how long have you lived in the Otways region? _____ **YEARS**

Q-2. How would you rate your knowledge of places in the Otways? (Please circle <u>one</u> response).
1 **Excellent**
2 **Good**
3 **Fair**
4 **Poor**

Q-3. How would you rate your knowledge of places in the Otways *compared to other* Otways residents? (Please circle <u>one</u> response).
1 **More knowledgable**
2 **About the same knowledge**
3 **Less knowledgable**
4 **No opinion**

Q-4. Below are a set of statements about your attachment to the Otways region. Please indicate your level of *agreement* or *disagreement* with each statement. (Please circle <u>one</u> response for each statement).

	STRONGLY AGREE	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	STRONGLY DISAGREE
EXAMPLE	1	②	3	4	5
a. I feel the Otways are a part of me.	1	2	3	4	5
b. The Otways are very special to me.	1	2	3	4	5
c. I identify strongly with the Otways.	1	2	3	4	5
d. I am very attached to the Otways.	1	2	3	4	5
e. Living in the Otways says a lot about who I am.	1	2	3	4	5
f. The Otways mean a lot to me.	1	2	3	4	5
g. The Otways are the best place for what I like to do.	1	2	3	4	5
h. No other place can compare to the Otways.	1	2	3	4	5
i. I get more satisfaction out of living in the Otways than any other place.	1	2	3	4	5
j. Doing what I do in the Otways is more important to me than doing it in any other place.	1	2	3	4	5
k. I wouldn't substitute any other area for doing the types of things I do in the Otways.	1	2	3	4	5
l. I feel relaxed when I am in the Otways.	1	2	3	4	5
m. I feel happiest when I am in the Otways.	1	2	3	4	5
n. The Otways is one of my favourite places to be.	1	2	3	4	5
o. I really miss the Otways when I am away from it for too long.	1	2	3	4	5

- 2 -

PART 2. Potential threats to your Otways quality of life.

Q-5. The items listed below may or may not be a **threat** to your quality of life as a resident of the Otways region. For each item, please indicate your level of *agreement* or *disagreement* about whether the item is a threat to your quality of life (Please circle <u>one</u> response for each item).

The____is a threat.....	STRONGLY AGREE	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	STRONGLY DISAGREE
a. Lack of economic opportunities	1	2	3	4	5
b. Increased number of visitors	1	2	3	4	5
c. Increased number of residents	1	2	3	4	5
d. State forest management decisions	1	2	3	4	5
e. National Park management decisions	1	2	3	4	5
f. Quality of education/school system	1	2	3	4	5
g. Quality of local government	1	2	3	4	5
h. Quality of state government	1	2	3	4	5
i. Increasing house/land prices	1	2	3	4	5
j. New housing subdivisions	1	2	3	4	5
k. Loss of coastal scenery	1	2	3	4	5
l. Prescribed burning in forest areas	1	2	3	4	5
m. Vegetation clearing (for agriculture or housing)	1	2	3	4	5
n. Commercial forestry	1	2	3	4	5
o. Visitor/tourist behaviour	1	2	3	4	5

Q-6. Over the time you have lived in the Otways, has tourism made it a less desirable place to live, more desirable place to live or stayed about the same? (Please circle <u>one</u> response).
- 1 Less desirable place to live
- 2 Stayed about the same
- 3 More desirable place to live

Q-7. Given your overall satisfaction with your quality of life in the Otways, what would you do if you had the opportunity to live somewhere else with the same or better standard of living? (Please circle <u>one</u> response).
- 1 I would still live in this place on the Otways.
- 2 I would move to another place or community on the Otways.
- 3 I would move away from the Otways.

- 3-

PART 2 (Continued). Potential threats to your Otways quality of life.

Q-8a. *How likely* is it that you would <u>attend a public meeting to speak out against</u> the following **threats** to your quality of life? (Please circle <u>one</u> response for each item).

	EXTREMELY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	EXTREMELY UNLIKELY
a. If the number of homes increased greatly in the region.	1	2	3	4
b. If a large resort complex was proposed in the region.	1	2	3	4
c. If forest management got a lot worse.	1	2	3	4
d. If the region became much more crowded with visitors.	1	2	3	4

Q-8b. *How likely* is it that you would <u>join a group to address</u> the following **threats** to your quality of life? (Please circle <u>one</u> response for each item).

	EXTREMELY LIKELY	SOMEWHAT LIKELY	SOMEWHAT UNLIKELY	EXTREMELY UNLIKELY
a. If the number of homes increased greatly in the region.	1	2	3	4
b. If a large resort complex was proposed in the region.	1	2	3	4
c. If forest management got a lot worse.	1	2	3	4
d. If the region became much more crowded with visitors.	1	2	3	4

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PART 3. Appropriate activities for the Otways.

Q-9. Please indicate your level of *agreement* or *disagreement* with the appropriateness of each of the following activities in the Otway Ranges National Park AND the Otway Forest Park (Please circle one response for each activity in each category).

The ____ activity is appropriate....	Otway National Park					Otway Forest Park				
	STRONGLY AGREE	AGREE	NEITHER	DISAGREE	STRONGLY DISAGREE	STRONGLY AGREE	AGREE	NEITHER	DISAGREE	STRONGLY DISAGREE
a. Horse-riding on formed tracks	1	2	3	4	5	1	2	3	4	5
b. Mountain-biking on formed tracks	1	2	3	4	5	1	2	3	4	5
c. Recreational fishing	1	2	3	4	5	1	2	3	4	5
d. Nature study/wildlife observation	1	2	3	4	5	1	2	3	4	5
e. Picnicking	1	2	3	4	5	1	2	3	4	5
f. Four-wheel driving on formed tracks	1	2	3	4	5	1	2	3	4	5
g. Walk-in camping	1	2	3	4	5	1	2	3	4	5
h. Vehicle-based dispersed camping (with no or limited facilities)	1	2	3	4	5	1	2	3	4	5
i. Bushwalking	1	2	3	4	5	1	2	3	4	5
j. Commercial tour operations	1	2	3	4	5	1	2	3	4	5
k. Grazing livestock	1	2	3	4	5	1	2	3	4	5
l. Mining	1	2	3	4	5	1	2	3	4	5
m. Walking dog along beaches	1	2	3	4	5	1	2	3	4	5
n. Firewood collection	1	2	3	4	5	1	2	3	4	5
o. Timber harvesting	1	2	3	4	5	1	2	3	4	5

- 5 -

PART 4. This section seeks your opinions about some important development issues for the Otways in the next 10-15 years.

Otways region

The adjacent map shows the study boundaries of the Otways *coast* and *hinterland*. Please use these boundaries to answer Questions 10-13.
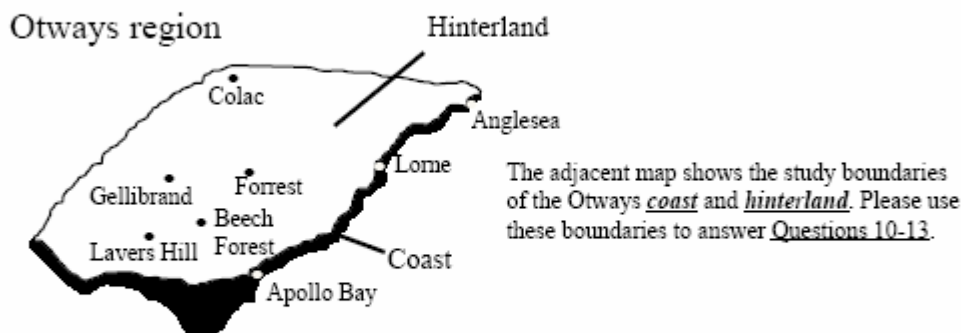
Q-10. What <u>type</u> of development is most likely to contribute to the Otway region's future economic prosperity and community well-being? (Please circle <u>one</u> response for each area).

Coastal Otways		Hinterland Otways	
1 Residential	4 Forestry	1 Residential	4 Forestry
2 Retail/commercial	5 Agricultural	2 Retail/commercial	5 Agricultural
3 Tourism	6 Other_____	3 Tourism	6 Other_____

Q-11. What would be your personal preference for the *visitor growth rate* in the Otways region? (Please circle <u>one</u> response for each area).

Coastal Otways	Hinterland Otways
1 Fast growth (+5% annual change)	1 Fast growth (+5% annual change)
2 Slow growth (+1% annual change)	2 Slow growth (+1% annual change)
3 Steady state (0% annual change)	3 Steady state (0% annual change)
4 Slow decline (-1% annual change)	4 Slow decline (-1% annual change)
5 Fast decline (-5% annual change)	5 Fast decline (-5% annual change)
6 No preference	6 No preference

Q-12. How would you describe the current level of Otways *hinterland* tourism development (including holiday homes)? (Please circle <u>one</u> response).
  1 Not enough--more tourism development should be encouraged in the hinterland
  2 About right--the present level of tourism development in the hinterland is appropriate
  3 Too much--the present level of tourism development in the hinterland concerns me
  4 No opinion

Q-13. How would you describe the current level of Otways *coastal* tourism development (including harbour developments and coastal resorts)? (Please circle <u>one</u> response).
  1 Not enough—more coastal tourism development should be encouraged
  2 About right—the present level of tourism development along the coast is appropriate
  3 Too much—the present level of tourism development along the coast concerns me
  4 No opinion

- 6 -

PART 5. Future development options for the Otways region.

Q-14. A number of development options are being considered for the Otways region. Please tell us whether you *favour* or *oppose* the following new types of development for the Otways region based on perceived need and compatibility with future Otways development (Please circle <u>one</u> response for each item).

	STRONGLY FAVOUR	FAVOUR	NEITHER FAVOUR OR OPPOSE	OPPOSE	STRONGLY OPPOSE
Accommodation					
Major hotel in an Otways township	1	2	3	4	5
Small motel in an Otways township	1	2	3	4	5
Nature-based lodge in a natural setting	1	2	3	4	5
Serviced apartments	1	2	3	4	5
Designated campgrounds (not caravan parks)	1	2	3	4	5
Caravan parks	1	2	3	4	5
Bed and breakfast accommodation	1	2	3	4	5
Dispersed camping (with no or very limited facilities)	1	2	3	4	5
Service Development					
Cafes	1	2	3	4	5
Restaurants	1	2	3	4	5
Fast food outlets	1	2	3	4	5
Harbour developments	1	2	3	4	5
Nature/visitor centre	1	2	3	4	5
Other					
Commercial/retail centres	1	2	3	4	5
Industrial/manufacturing facilities	1	2	3	4	5
Boutique wineries	1	2	3	4	5
Wind farms	1	2	3	4	5
Other_____	1	2	3	4	5

Any comments? _____
_____
_____

PART 5 (continued). Future development options for the Otways region.

Q-15. A number of forest plantations on public lands in the Otways will be allowed to be logged beyond 2008 under various licences and leasing arrangements. Please tell us whether you *favour* or *oppose* the following types of forestry practices based on perceived need and compatibility with future Otways development (Please circle <u>one</u> response for each item).

	STRONGLY FAVOUR	FAVOUR	NEITHER FAVOUR OR OPPOSE	OPPOSE	STRONGLY OPPOSE
a. Plantations on private land.	1	2	3	4	5
b. Plantations on public land.	1	2	3	4	5
c. Logging of native forests <u>up to</u> 2008.	1	2	3	4	5
d. Logging of native forests <u>after</u> 2008.	1	2	3	4	5

Q-16. Land managers are considering several sites for tourism development in the Otways. Please tell us whether you *favour* or *oppose* tourism development at the following locations. (Please circle <u>one</u> response for each item).

	STRONGLY FAVOUR	FAVOUR	NEITHER FAVOUR OR OPPOSE	OPPOSE	STRONGLY OPPOSE
a. Tourism development around Lavers Hill and Melba Gully.	1	2	3	4	5
b. Tourism development around the Otway Fly, Triplet Falls and Victree site.	1	2	3	4	5
c. Tourism development around Forrest, Barwon Dam and Lake Elizabeth.	1	2	3	4	5
d. Tourism development at Glenaire/ Aire River Estuary.	1	2	3	4	5
e. Tourism development at Cape Otway Lighthouse Station.	1	2	3	4	5

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> ## Part 6. Mapping places in the Otways region.

Q-17. And now for something different! Different people value different places in the Otways region for different reasons. In this section, please show us the specific places in the Otways you value. **Please follow the directions below.**

STEP ① Mapping Otway Values

Find the *enclosed* Otway map and set of sticker dots. There are 12 sets of dots that identify different values for places in the Otways such as scenic value or recreation value. Stick the dots on the Otways map where you think these values are. These dots also have "importance" ratings from 5 to 50 points. Put the largest scenic dots (for example 50a) on the most scenic places, the largest recreation dots (50r) on places with the highest recreation value, and so on with the other value dots. *Use as many or few dots as you like.*

Map Dots   **Put on...** ➡ **Enclosed Otways Map**

- Scenic value
- Economic value
- Recreation value
- Life sustaining value
- Learning value
- Biological value
- ....

STEP ② Mapping Your Special Places

Find the 6 "Special Place" dots marked **P1 through P6.** These dots represent your favourite or "special places" in the Otways. These places can be special for *any* reason. Place up to 6 dots on the map.

In the space below, write the reasons why these places are special to you.

Special Place #1 _____

Special Place #2 _____

Special Place #3 _____

Special Place #4 _____

Special Place #5 _____

Special Place #6 _____

STEP ③ Mapping places for development (or no development)

Are there places in the Otways where future development should or should not occur?
Use as many or few dots as you like.

Use **nd1** through **nd6** dots to show places where all future development should be prohibited (**nd**=no development).

Use **rd1** through **rd6** dots to show places where *residential development* could conditionally occur with a good development plan (**rd**=residential development).

Use **ta1** through **ta6** dots to show places where *tourism accommodation development* could conditionally occur with a good plan (**ta**=tourism accomodation development)

Use **ts1** through **ts6** dots to show places where *tourism services development* could conditionally occur with a good plan (**ts**=tourism services development)

Please complete the remainder of this questionnaire.

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PART 7. Information about yourself.

Q-18. What place or community do you live in within the Otways? _____

Q-19. Is this your permanent residence?   YES   NO

Q-20. How long have you lived in this place in the Otways?   _____ YEARS

Q-21. What is your age?   _____YEARS

Q-22. What is your gender? (Please circle <u>one</u> response).
    1 Male
    2 Female

Q-23. What is the highest level of formal education you have completed? (Please circle <u>one</u> response).
    1   None   5   Tertiary
    2   Primary/Some Secondary School   6   Postgraduate
    3   Secondary School   7   Prefer not to answer
    4   Vocational/Technical training

Q-24. What is your occupation?   OCCUPATION _____

Q-25. Which employment category best describes you? (Please circle <u>one</u> response).
    1 Agriculture   6 Commercial/retail
    2 Tourism   7 Tradesman
    3 Government   8 Homemaker
    4 Education   9 Retired
    5 Professional services   10 Other (please specify)_____

Q-26. Which category best describes you? (Please circle <u>all</u> responses that apply).
    1 I work in a tourism business
    2 Someone in my immediate family works in the tourism business
    3 My immediate family <u>owns</u> a tourism business
    4 My close friends or associates work in the tourism business
    5 I have no association with tourism at all
    6 Other _____

Q-27. Which category best describes your home life? (Please circle <u>one</u> response).
    1 Live alone
    2 Couple with children
    3 Couple (no children)
    4 Other_____

Q-28. Do you consider yourself an advocate for the environment? (Please circle <u>one</u> response).
    1 YES
    2 NO
    3 SOMEWHAT

-10 -

Is there anything else you would like to tell us about the Otways and the potential threats and opportunities facing the region in the next 10-15 years? We would appreciate any comments.

We will automatically send you the survey results unless you check the box below.

☐ NO. PLEASE DO *NOT* SEND ME THE SURVEY RESULTS.

I would prefer the results sent by email: My email address is _____ .

THANK YOU FOR YOUR HELP!

Appendix B: Visitor Survey

Mapping the future of the Otways region

Rufous Bristlebird (Otways)
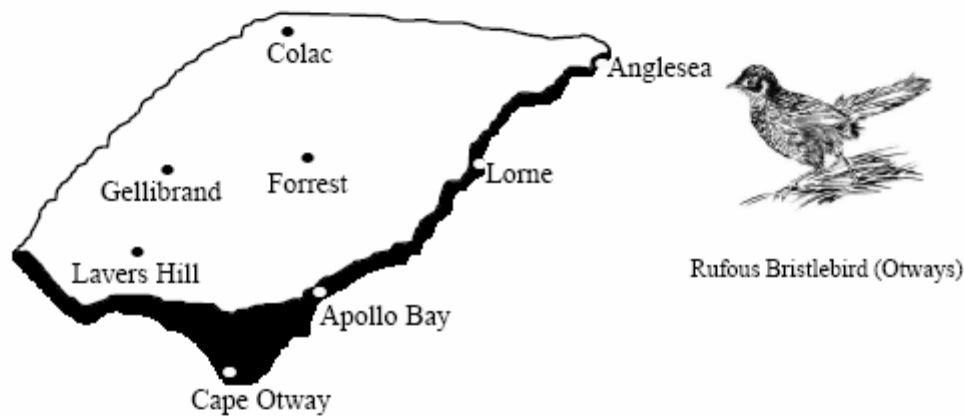
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University of South Australia
Mawson Lakes Campus
Mawson Lakes, SA 5095

As a visitor to the Otways region, you may well have a personal interest in its future. This survey asks what you value about the Otways and what you would like (or not like) to see changed in the area.

Several places in the survey refer to the Otways region. This region includes both the Great Ocean Road (Coast) and Otway Hinterland. See map below.

Otways region

Hinterland

Colac

Anglesea

Lorne

Gellibrand   Forrest

Lavers Hill

Coast

Apollo Bay

Information collected from this survey will be made available to planning organisations such as Parks Victoria, Department of Sustainability and Environment, Victorian Environmental Assessment Council, Colac-Otway Shire, Surf Coast Shire and any Otways visitor interested in the results. This survey is an important opportunity for you to express your future vision for the Otways region.
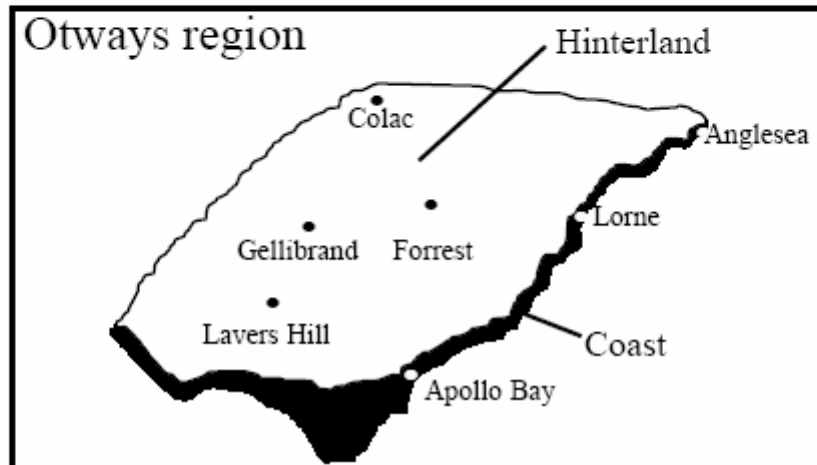
Please complete as much of the survey as possible. If a question is not clear, simply go to the next question. *__The most important part to complete is Part 6 where you identify the places you value in the Otways__*. We have provided a postage-paid envelope to return the survey and map.

We appreciate your participation in this study.

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- 1 -

PART 1. Your familiarity and attachment to the Otways region

Q-1. About how many times have you visited the Otways region in your lifetime?

1 1 time only	4 6-10 times
2 2-3 times	5 More than 10 times
3 4-5 times	6 I live in the Otways

Q-2a. Using the Otways map below, please show all Otways areas you have visited, either on your last visit or on previous visits. (Please *check one or more boxes* like this)>> ☒
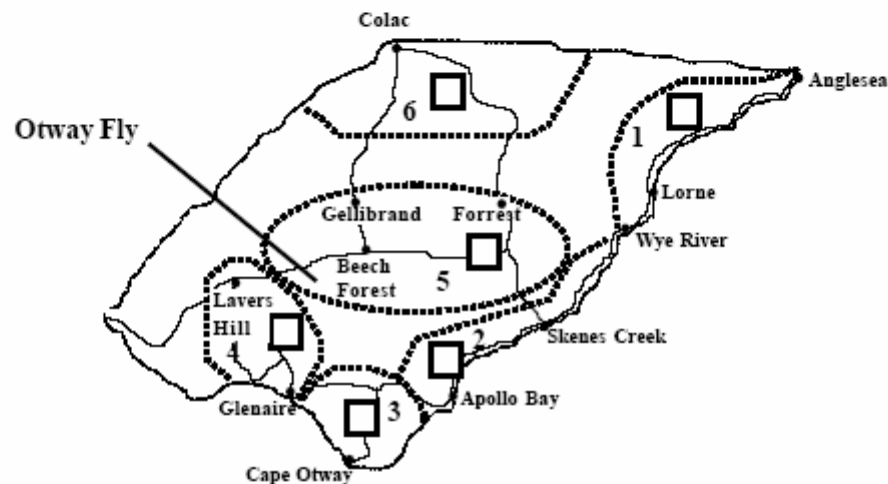
Q-2b. Which <u>area</u> of the Otways have you spent the most time? (Please circle <u>one</u> response).

1 Lorne/Anglesea (Area 1)
2 Apollo Bay area (Area 2)
3 Cape Otway area (Area 3)
4 Lavers Hill/Glenaire area
5 Otway Fly/Beech Forest/Forrest area
6 Colac area

Q-3. Overall, how would you rate your knowledge of places in the Otways? (Please circle <u>one</u> response).

1 Excellent
2 Good
3 Fair
4 Poor

Q-4. How would you rate your knowledge of places in the Otways *compared to other* Otways residents? (Please circle <u>one</u> response).

1 More knowledgable
2 About the same knowledge
3 Less knowledgable
4 No opinion

- 2 -

PART 1 (continued). Your familiarity and attachment to the Otways region

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Q-5. Below are a set of statements about your attachment to the Otways region. Please indicate your level of *agreement* or *disagreement* with each statement. (Please circle <u>one</u> response for each statement).

	STRONGLY AGREE	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	STRONGLY DISAGREE
EXAMPLE	1	②	3	4	5
a. I feel the Otways are a part of me.	1	2	3	4	5
b. The Otways are very special to me.	1	2	3	4	5
c. I identify strongly with the Otways.	1	2	3	4	5
d. I am very attached to the Otways.	1	2	3	4	5
e. Living in the Otways says a lot about who I am.	1	2	3	4	5
f. The Otways mean a lot to me.	1	2	3	4	5
g. The Otways are the best place for what I like to do.	1	2	3	4	5
h. No other place can compare to the Otways.	1	2	3	4	5
i. I get more satisfaction out of living in the Otways than any other place.	1	2	3	4	5
j. Doing what I do in the Otways is more important to me than doing it in any other place.	1	2	3	4	5
k. I wouldn't substitute any other area for doing the types of things I do in the Otways.	1	2	3	4	5
l. I feel relaxed when I am in the Otways.	1	2	3	4	5
m. I feel happiest when I am in the Otways	1	2	3	4	5
n. The Otways is one of my favourite places to be.	1	2	3	4	5
o. I really miss the Otways when I am away from it for too long.	1	2	3	4	5

Q-6. All else being equal, I would rather spend my outdoor recreational time along the *coastal Otways* than in the *hinterland Otways*:

    1 Strongly agree
    2 Agree
    3 Neither agree or disagree
    4 Disagree
    5 Strongly disagree

- 3 -

PART 2. Potential threats to your Otways visitor experience.

Q-7. The items listed below <u>may</u> or <u>may not</u> be a **threat** to your Otways visitor experience. For each item, please indicate your level of *agreement* or *disagreement* about whether the item is a threat to your visitor experience (Please circle <u>one</u> response for each item).

The _____ is a threat.....	STRONGLY AGREE	AGREE	NEITHER AGREE OR DISAGREE	DISAGREE	STRONGLY DISAGREE
a. Increased number of visitors	1	2	3	4	5
b. Increased number of residents	1	2	3	4	5
c. Poor National Park management decisions	1	2	3	4	5
d. Poor quality of tourism services (e.g. restaurants, entertainment, petrol, groceries)	1	2	3	4	5
e. Poor quality of directional signage	1	2	3	4	5
f. Poor quality of Otway roads	1	2	3	4	5
g. Loss of coastal scenery by development	1	2	3	4	5
h. Prescribed burning in forest areas	1	2	3	4	5
i. Vegetation clearing (for agriculture or housing)	1	2	3	4	5
j. Commercial forestry	1	2	3	4	5
k. Other negative visitor/tourist behaviour	1	2	3	4	5

Q-8. Over the time you have visited the Otways, has tourism made it a less desirable place to visit, more desirable place to visit or stayed about the same? (Please circle <u>one</u> response).

1 Less desirable place to visit
2 Stayed about the same
3 More desirable place to visit
4 Have not visited enough to form an opinion

Q-9. Given your overall satisfaction with your Otways visitor experience, what do you plan to do in the future? (Please circle <u>one</u> response).

1 I will visit the Otways more frequently
2 I will visit the Otways about the same frequency
3 I will visit the Otways less frequently
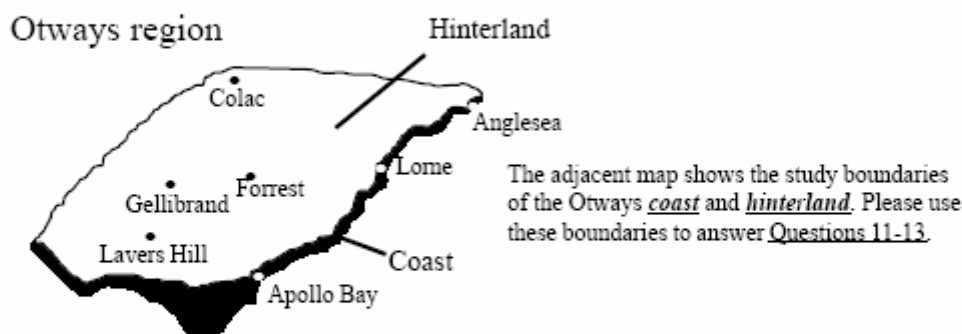4 I do not plan to return to the Otways

44

- 4 -

PART 3. Appropriate activities for the Otways.

Q-10. Please indicate your level of *agreement* or *disagreement* with the appropriateness of each of the following activities in the **Otway Ranges National Park** AND **public lands outside the national park** (Please circle one response for each activity in each category).

The _____ activity is appropriate....	Otway National Park					Public lands outside the National Park				
	STRONGLY AGREE	AGREE	NEITHER	DISAGREE	STRONGLY DISAGREE	STRONGLY AGREE	AGREE	NEITHER	DISAGREE	STRONGLY DISAGREE
a. Horse-riding on formed tracks	1	2	3	4	5	1	2	3	4	5
b. Mountain-biking on formed tracks	1	2	3	4	5	1	2	3	4	5
c. Recreational fishing	1	2	3	4	5	1	2	3	4	5
d. Nature study/wildlife observation	1	2	3	4	5	1	2	3	4	5
e. Picnicking	1	2	3	4	5	1	2	3	4	5
f. Four-wheel driving on formed tracks	1	2	3	4	5	1	2	3	4	5
h. Walk-in camping	1	2	3	4	5	1	2	3	4	5
i. Vehicle-based dispersed camping (with no or limited facilities)	1	2	3	4	5	1	2	3	4	5
j. Bushwalking	1	2	3	4	5	1	2	3	4	5
k. Commercial tour operations	1	2	3	4	5	1	2	3	4	5
l. Grazing livestock	1	2	3	4	5	1	2	3	4	5
m. Mining	1	2	3	4	5	1	2	3	4	5
n. Walking dog along beaches	1	2	3	4	5	1	2	3	4	5
o. Firewood collection	1	2	3	4	5	1	2	3	4	5
p. Timber harvesting	1	2	3	4	5	1	2	3	4	5

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> PART 4. This section seeks your opinions about some important
> development issues for the Otways in the next 10-15 years.

Otways region   Hinterland

The adjacent map shows the study boundaries of the Otways *coast* and *hinterland*. Please use these boundaries to answer Questions 11-13.

Q-11. What would be your personal preference for the *visitor growth rate* in the Otways region? (Please circle one response for each area).

Coastal Otways	Hinterland Otways
1 Fast growth (+5% annual change)	1 Fast growth (+5% annual change)
2 Slow growth (+1% annual change)	2 Slow growth (+1% annual change)
3 Steady state (0% annual change)	3 Steady state (0% annual change)
4 Slow decline (-1% annual change)	4 Slow decline (-1% annual change)
5 Fast decline (-5% annual change)	5 Fast decline (-5% annual change)
6 No preference	6 No preference

Q-12. How would you describe the current level of Otways *hinterland* tourism development (including holiday homes)? (Please circle one response).

    1 Not enough--more tourism development should be encouraged in the hinterland
    2 About right--the present level of tourism development in the hinterland is appropriate
    3 Too much--the present level of tourism development in the hinterland concerns me
    4 No opinion

Q-13. How would you describe the current level of Otways *coastal* tourism development (including harbour developments and coastal resorts)? (Please circle one response).

    1 Not enough—more coastal tourism development should be encouraged
    2 About right—the present level of tourism development along the coast is appropriate
    3 Too much—the present level of tourism development along the coast concerns me
    4 No opinion

- 6 -

PART 5. Future development options for the Otways region.

Q-14. A number of development options are being considered for the Otways region. Please tell us whether you *favour* or *oppose* the following new types of development for the Otways region (Please circle one response for each item).

	STRONGLY FAVOUR	FAVOUR	NEITHER FAVOUR OR OPPOSE	OPPOSE	STRONGLY OPPOSE
Accommodation					
Major hotel in an Otways township	1	2	3	4	5
Small motel in an Otways township	1	2	3	4	5
Nature-based lodge in a natural setting	1	2	3	4	5
Serviced apartments	1	2	3	4	5
Designated campgrounds (not caravan parks)	1	2	3	4	5
Caravan parks	1	2	3	4	5
Bed and breakfast accommodation	1	2	3	4	5
Dispersed camping (with no or very limited facilities)	1	2	3	4	5
Service Development					
Cafes	1	2	3	4	5
Restaurants	1	2	3	4	5
Fast food outlets	1	2	3	4	5
Harbour developments	1	2	3	4	5
Nature/visitor centre	1	2	3	4	5
Other					
Commercial/retail centres	1	2	3	4	5
Industrial/manufacturing facilities	1	2	3	4	5
Boutique wineries	1	2	3	4	5
Wind farms	1	2	3	4	5
Other_____	1	2	3	4	5

Any comments? _____
_____
_____

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PART 5 (continued). Future development options for the Otways region.

Q-15. A number of forest plantations on public lands in the Otways will be allowed to be logged beyond 2008 under various licences and leasing arrangements. Please tell us whether you *favour* or *oppose* the following types of forestry practices (Please circle <u>one</u> response for each item).

	STRONGLY FAVOUR	FAVOUR	NEITHER FAVOUR OR OPPOSE	OPPOSE	STRONGLY OPPOSE
a. Plantations on private land.	1	2	3	4	5
b. Plantations on public land.	1	2	3	4	5
c. Logging of native forests <u>up to</u> 2008.	1	2	3	4	5
d. Logging of native forests <u>after</u> 2008.	1	2	3	4	5

Q-16. Land managers are considering several sites for tourism development in the Otways. Please tell us whether you *favour* or *oppose* tourism development at the following locations. (Please circle <u>one</u> response for each item).

	STRONGLY FAVOUR	FAVOUR	NEITHER FAVOUR OR OPPOSE	OPPOSE	STRONGLY OPPOSE	NOT FAMILIAR ENOUGH
a. Tourism development around Lavers Hill and Melba Gully.	1	2	3	4	5	6
b. Tourism development around the Otway Fly, Triplet Falls and Victree site (e.g. in Beech Forest).	1	2	3	4	5	6
c. Tourism development around Forrest, Barwon Dam and Lake Elizabeth.	1	2	3	4	5	6
d. Tourism development at Glenaire/Aire River Estuary.	1	2	3	4	5	6
e. Tourism development at Cape Otway Lighthouse Station.	1	2	3	4	5	6

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Part 6. Mapping places in the Otways Region.

Q-17. And now for something different! Different people value different places in the Otways region for different reasons. In this section, please show us the specific places in the Otways you value. Please follow the directions below.

STEP ① Mapping Otway Values

Find the *enclosed* Otway map and set of sticker dots. There are 12 sets of dots that identify different values for places in the Otways such as scenic value or recreation value. Stick the dots on the Otway map where you think these values are. These dots also have "importance" ratings from 5 to 50 points. Put the largest scenic dots (for example 50a) on the most scenic places, the largest recreation dots (50r) on places with the highest recreation value, and so on with the other value dots. *Use as many or few dots as you like.*

Map Dots   **Put on...** ➡ **Enclosed Otways Map**

50a	20a	10a	10a	5a	5a	Scenic value
50b	20b	10b	10b	5b	5b	Economic value
50r	20r	10r	10r	5r	5r	Recreation value
50l	20l	10l	10l	5l	5l	Life sustaining value
50m	20m	10m	10m	5m	5m	Learning value
50b	20b	10b	10b	5b	5b	Biological value

....

STEP ② Mapping Your Special Places

Find the 6 "Special Place" dots marked **P1 through P6.** These dots represent your favourite or "special places" in the Otways. These places can be special for *any* reason. Place up to 6 dots on the map.

In the space below, write the reasons why these places are special to you.

Special Place #1 _____

Special Place #2 _____

Special Place #3 _____

Special Place #4 _____

Special Place #5 _____

Special Place #6 _____

STEP ③ Mapping places for development (or no development)

Are there places in the Otways where future development should or should not occur?
Use as many or few dots as you like.

Use **nd1** through **nd6** dots to show places where all future development should be prohibited (**nd**=no development).

Use **rd1** through **rd6** dots to show places where *residential development* could conditionally occur with a good development plan (**rd**=residential development).

Use **ta1** through **ta6** dots to show places where *tourism accommodation development* could conditionally occur with a good plan (**ta**=tourism accomodation development)

Use **ts1** through **ts6** dots to show places where *tourism services development* could conditionally occur with a good plan (**ts**=tourism services development)

Please complete the remainder of this questionnaire.

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PART 7.   Information about yourself.

Q-18. What is your age?   _____YEARS

Q-19. What is your gender? (Please circle <u>one</u> response).
     1 Male
     2 Female

Q-20. What is the highest level of formal education you have completed? (Please circle <u>one</u> response).
    1 None   5 Tertiary
    2 Primary/Some Secondary School   6 Postgraduate
    3 Secondary School   7 Prefer not to answer
    4 Vocational/Technical training

Q-21. What is your occupation?   OCCUPATION _____

Q-22. Which employment category best describes you? (Please circle <u>one</u> response).
    1 Agriculture   6 Commercial/retail
    2 Tourism   7 Tradesman
    3 Government   8 Homemaker
    4 Education   9 Retired
    5 Professional services   10 Other (please specify)_____

Q-23. Which category best describes you? (Please circle <u>all</u> responses that apply)
    1 I work in a tourism business
    2 Someone in my immediate family works in the tourism business
    3 My immediate family <u>owns</u> a tourism business
    4 My close friends or associates work in the tourism business
    5 I have no association with tourism at all
    6 Other _____

Q-24. Which category best describes your home life? (Please circle <u>one</u> response).
    1 Live alone
    2 Couple with children
    3 Couple (no children)
    4 Other_____

Q-25. Do you consider yourself an advocate for the environment? (Please circle <u>one</u> response).
    1 YES
    2 NO
    3 SOMEWHAT

-10-

Is there anything else you would like to tell us about the Otways and your visitor experience? We would appreciate any comments.

We will automatically send you the survey results unless you check the box below.

☐ NO. PLEASE DO *NOT* SEND ME THE SURVEY RESULTS.

I would prefer the results sent by email: My email address is _____.

THANK YOU FOR YOUR HELP!

Appendix C: Landscape Values, Special Places and Development Preferences

50 Points	20 Points	10 Points	10 Points	5 Points	5 Points	
50a	20a	10a	10a	5a	5a	**Aesthetic/scenic value**—I value these places for the attractive scenery, sights, smells, or sounds.
50e	20e	10e	10e	5e	5e	**Economic value**—I value these places for economic benefits such as tourism, forestry, agriculture, or other commercial activity.
50r	20r	10r	10r	5r	5r	**Recreation value**—I value these places because they provide outdoor recreation opportunities.
50L	20L	10L	10L	5L	5L	**Life Sustaining value**—I value these places because they help produce, preserve, and renew air, soil, and water.
50k	20k	10k	10k	5k	5k	**Learning value (knowledge)**—I value these places because we can use them to learn about the environment.
50b	20b	10b	10b	5b	5b	**Biological diversity value**—I value these places because they provide for a variety of plants, wildlife, marine life, or other living organisms
50s	20s	10s	10s	5s	5s	**Spiritual value**—I value these places because they are spiritually special to me.
50i	20i	10i	10i	5i	5i	**Intrinsic value**—These places are valuable for their own sake, no matter what I or others think about them or whether they are actually used
50h	20h	10h	10h	5h	5h	**Heritage value**—I value these places because they have natural and human history.
50f	20f	10f	10f	5f	5f	**Future value**—I value these places because they allow future generations to know and experience them as they are now.
50t	20t	10t	10t	5t	5t	**Therapeutic value**—I value these places because they make people feel better, physically and/or mentally.
50w	20w	10w	10w	5w	5w	**Wilderness value** --I value these places because they are wild.

① Place Values

P1	P2	P3	P4	P5	P6	**SPECIAL PLACES**—Use these dots (**P1 through P6**) to identify up to 6 of your special places. Please remember to write your reason why these places are special in the survey booklet.

② Your special Places

| nd1	nd2	nd3	nd4	nd5	nd6	**No Development.** Use these dots to identify areas where any future development should be permanently prohibited.
rd1	rd2	rd3	rd4	rd5	rd6	**Residential Development.** Use these dots to identify areas where <u>residential</u> development could conditionally occur with a good plan.
ta1	ta2	ta3	ta4	ta5	ta6	**Tourism Development.** **Accommodation.** Use these dots to identify areas where <u>tourism</u> accommodation could conditionally occur with a good plan.
ts1	ts2	ts3	ts4	ts5	ts6	**Services.** Use these dots to identify areas where <u>tourism</u> services (e.g.,restaurants, entertainment, petrol, groceries) could conditionally occur.

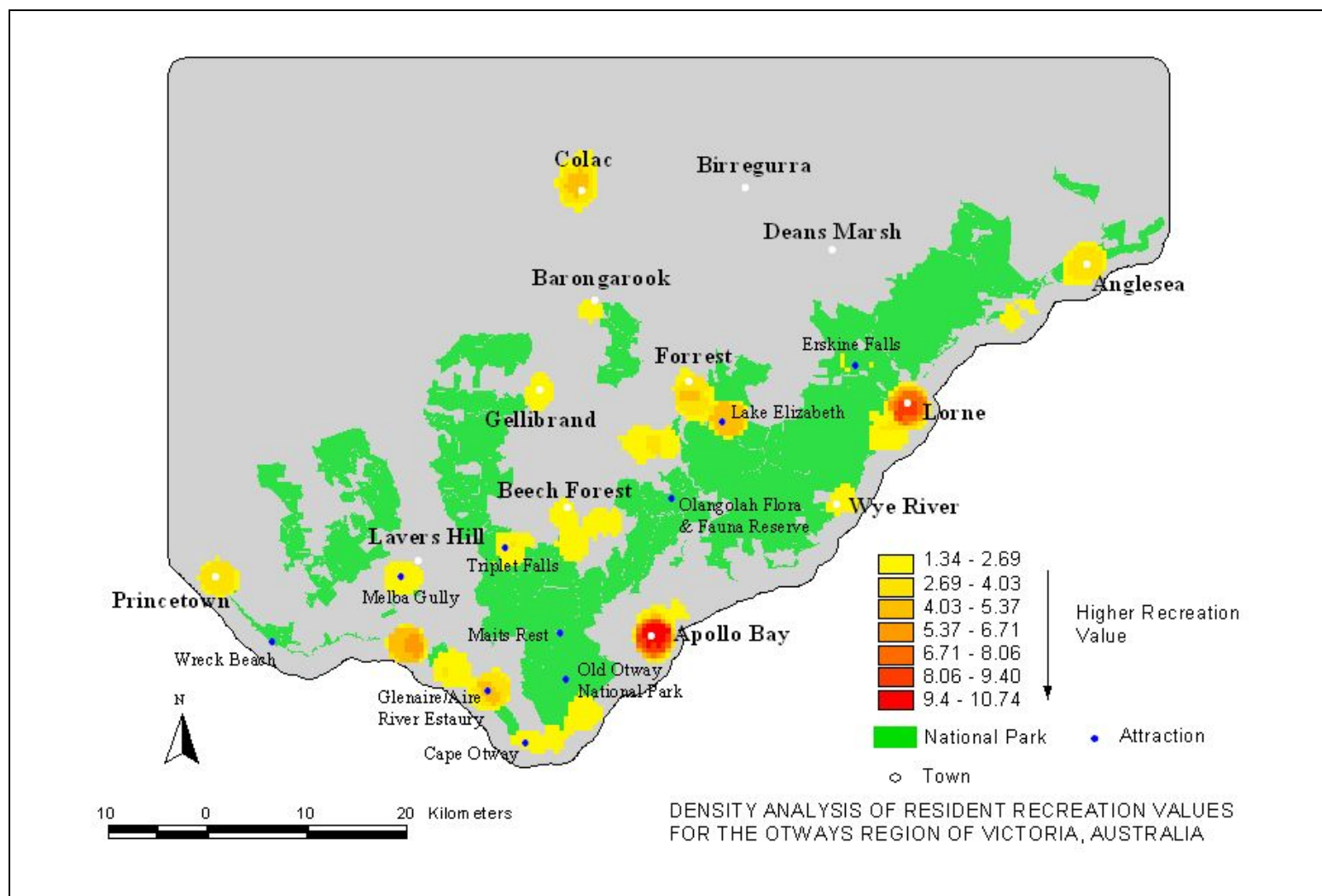**③ Development (No development) places**
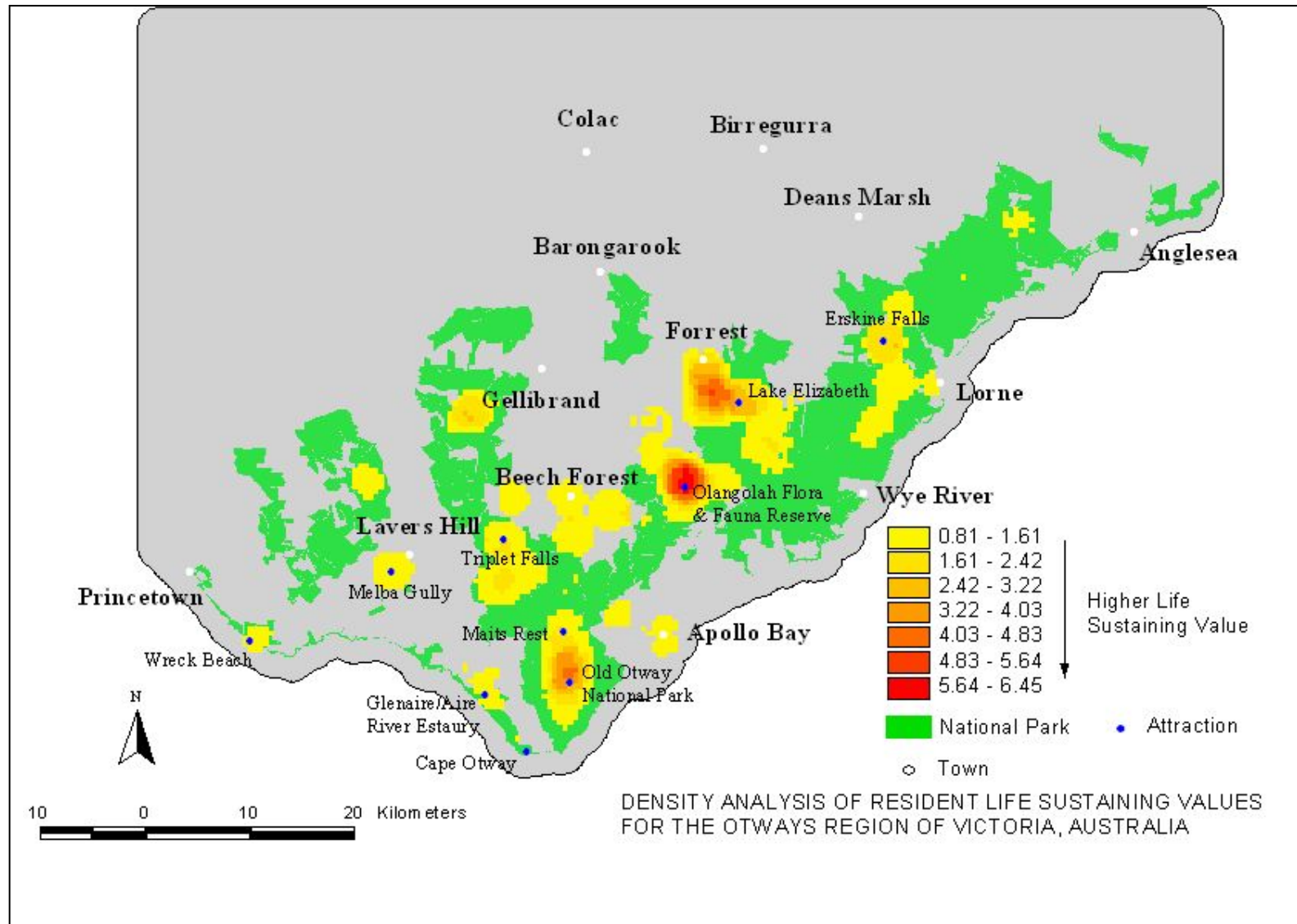
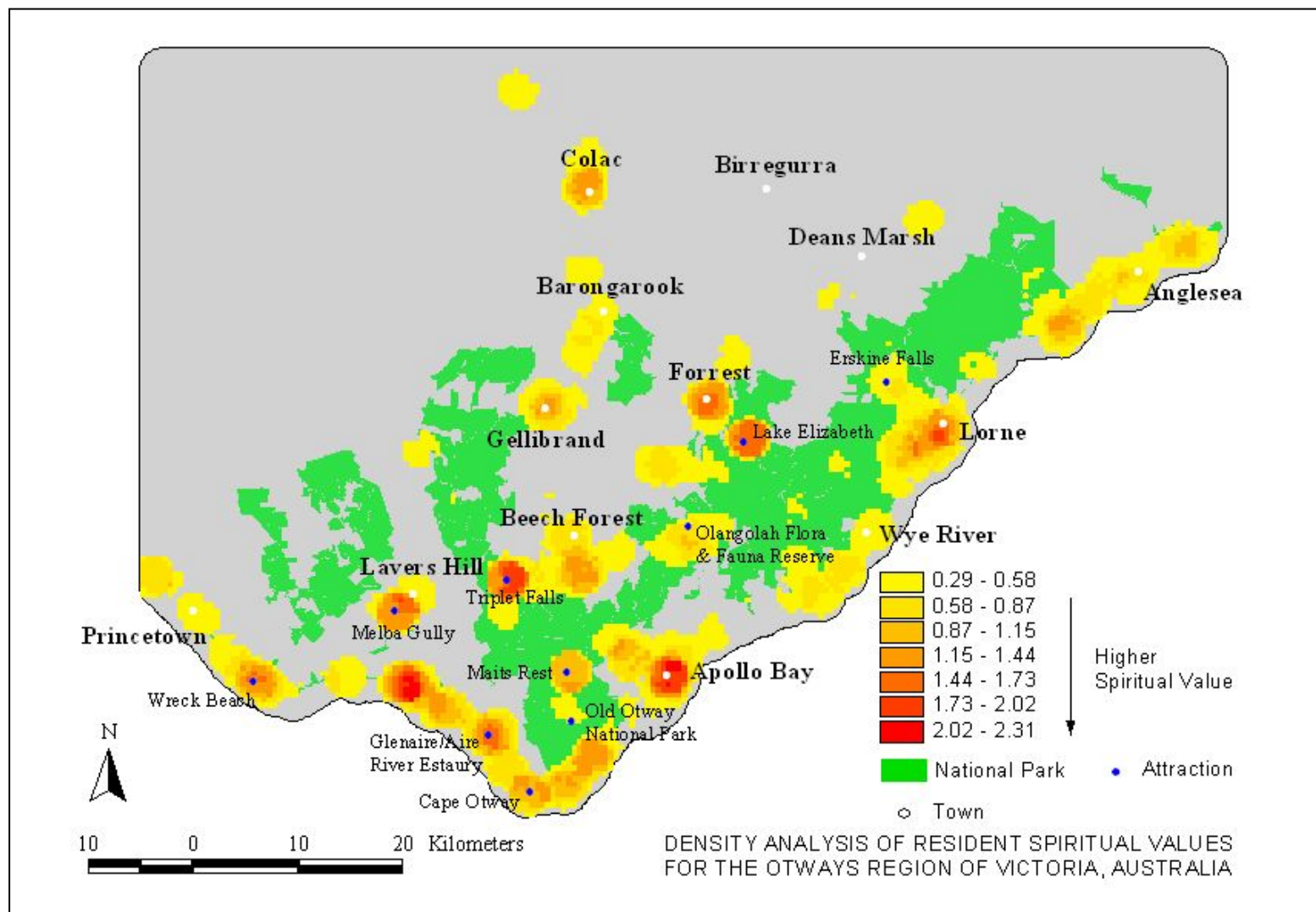**Otways Region Map Dots**

Appendix D: Density Map of Aesthetic Values
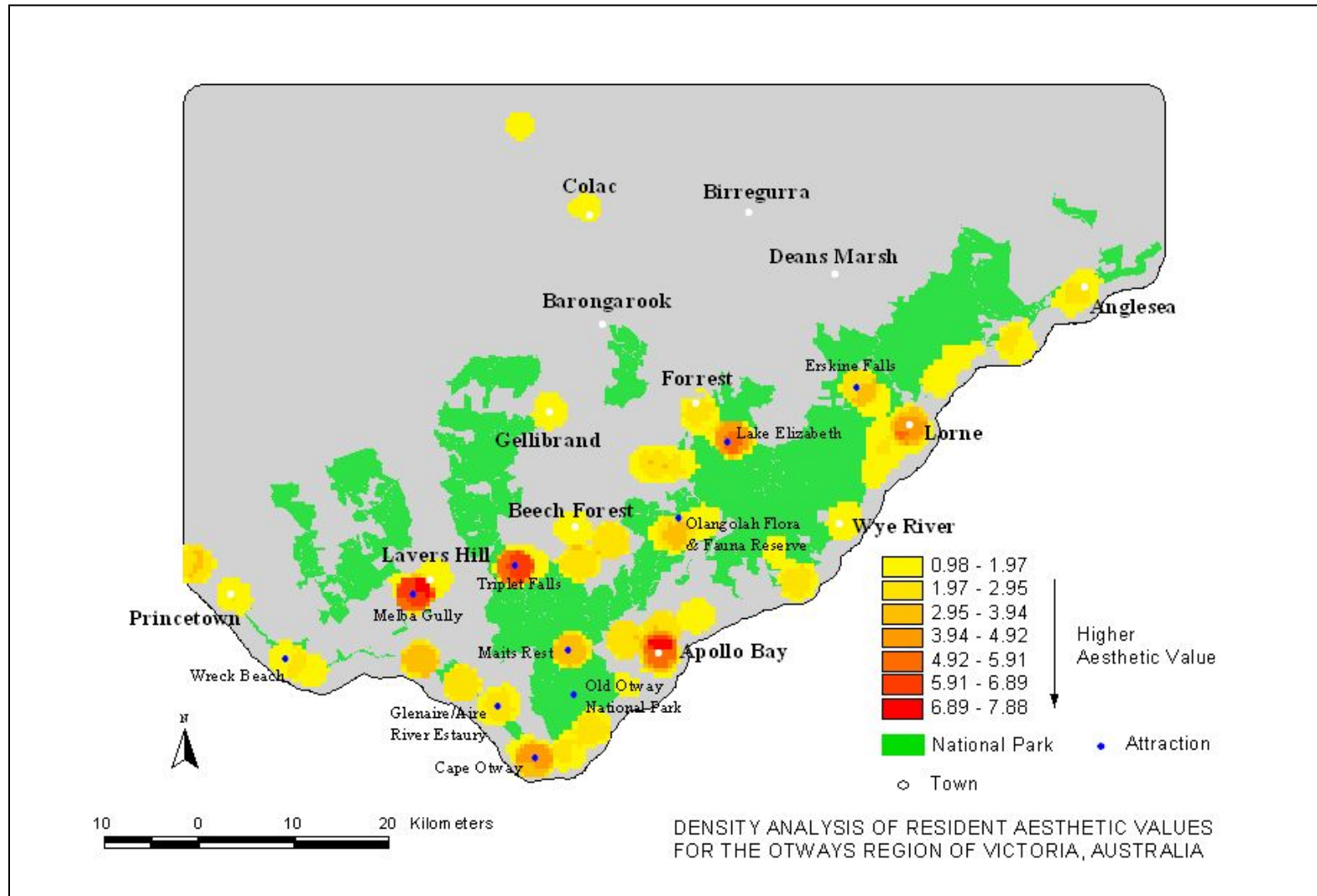
Appendix E: Density Map of Recreation Values

Appendix F: Density Map of Life Sustaining Values

DENSITY ANALYSIS OF RESIDENT LIFE SUSTAINING VALUES
FOR THE OTWAYS REGION OF VICTORIA, AUSTRALIA

Appendix G: Density Map of Spiritual Values

DENSITY ANALYSIS OF RESIDENT SPIRITUAL VALUES
FOR THE OTWAYS REGION OF VICTORIA, AUSTRALIA

Appendix H: Density Map of Biological Diversity Values

DENSITY ANALYSIS OF RESIDENT BIOLOGICAL DIVERSITY VALUES FOR THE OTWAYS REGION OF VICTORIA, AUSTRALIA
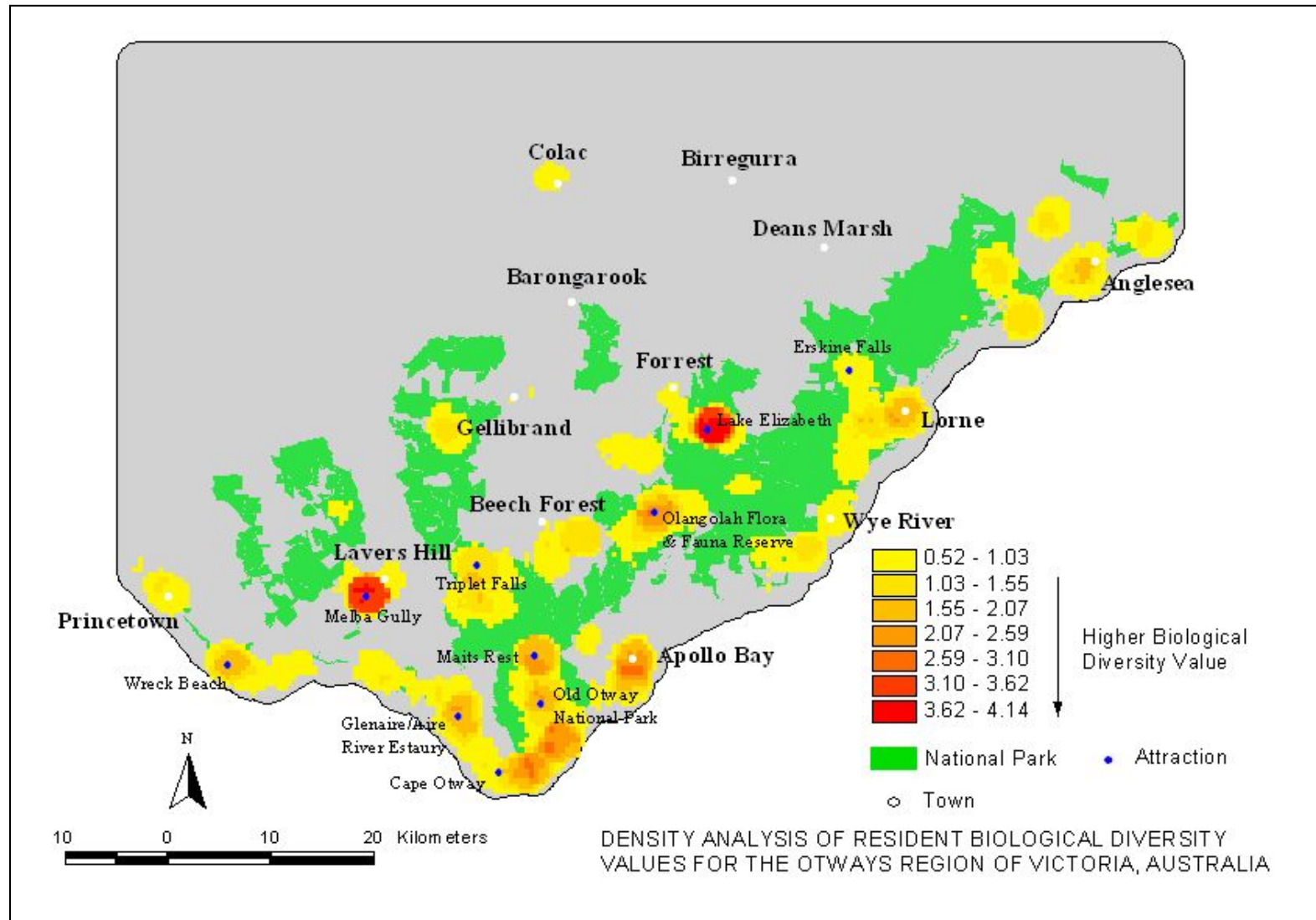
Appendix I: Density Map of Economic Values

DENSITY ANALYSIS OF RESIDENT ECONOMIC VALUES
FOR THE OTWAYS REGION OF VICTORIA, AUSTRALIA
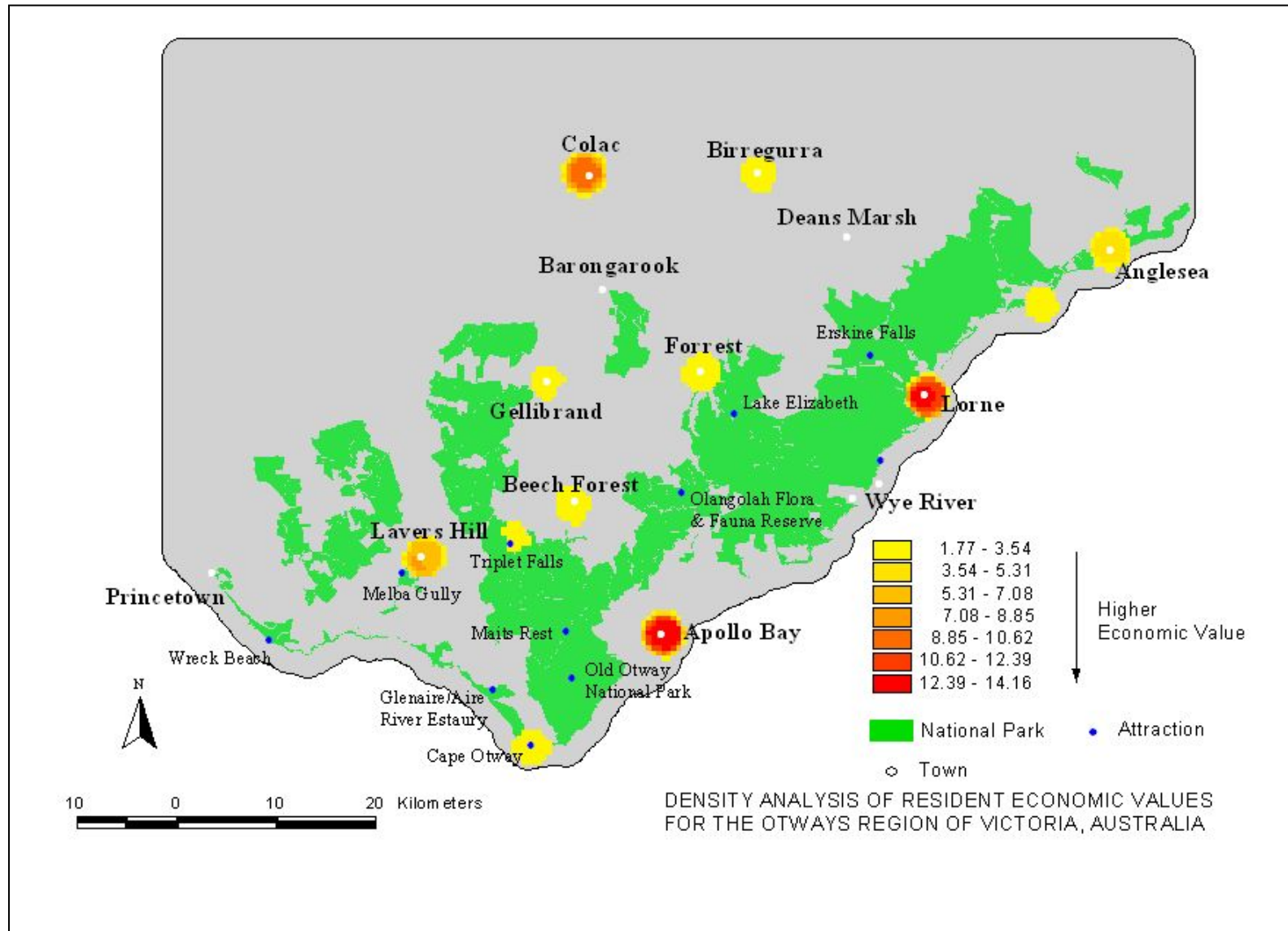
Appendix J: Density Map of Wilderness Values

DENSITY ANALYSIS OF RESIDENT WILDERNESS VALUES
FOR THE OTWAYS REGION OF VICTORIA, AUSTRALIA
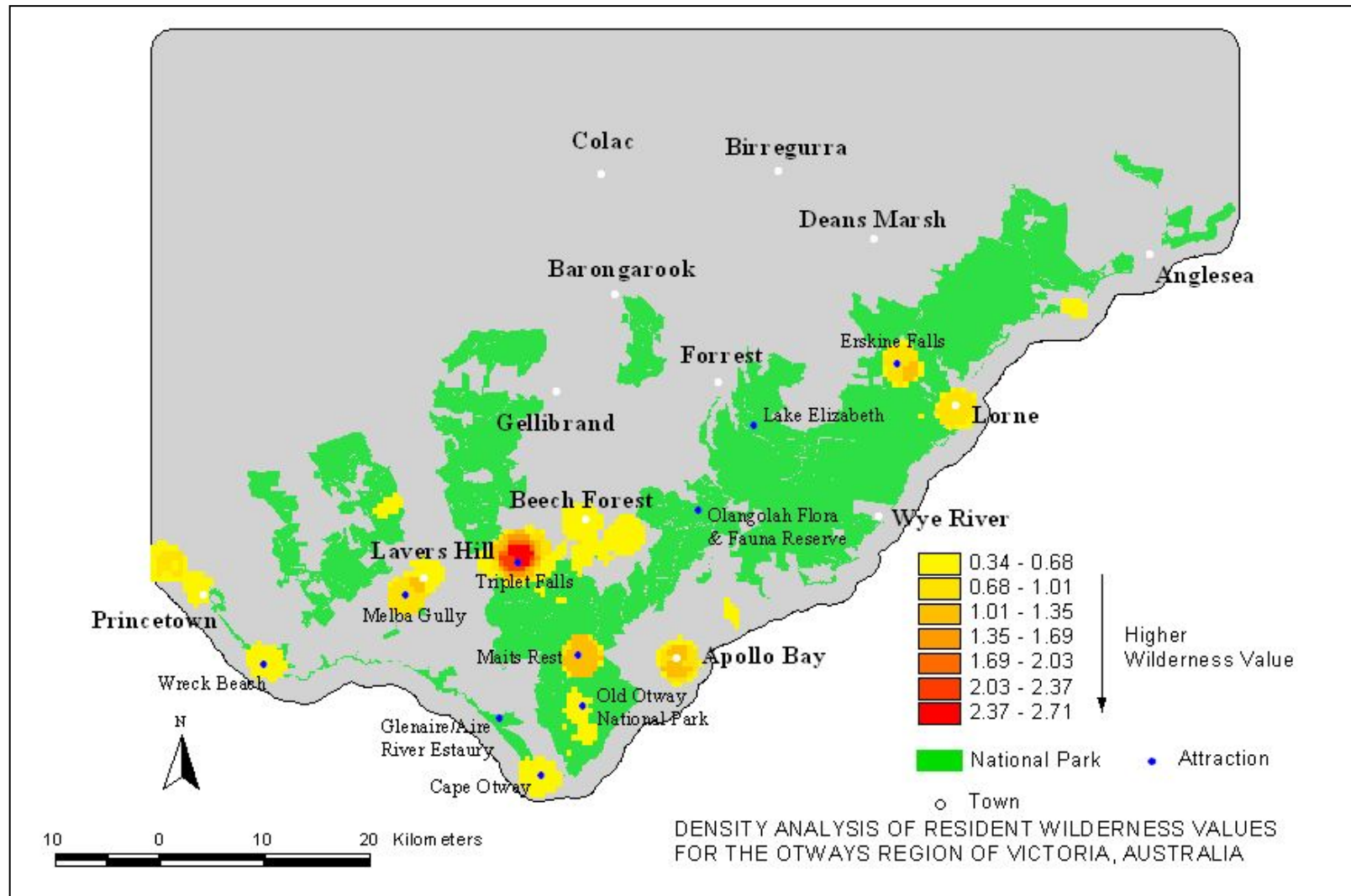
Appendix K: Density Map of Future Values

DENSITY ANALYSIS OF RESIDENT FUTURE VALUES
FOR THE OTWAYS REGION OF VICTORIA, AUSTRALIA
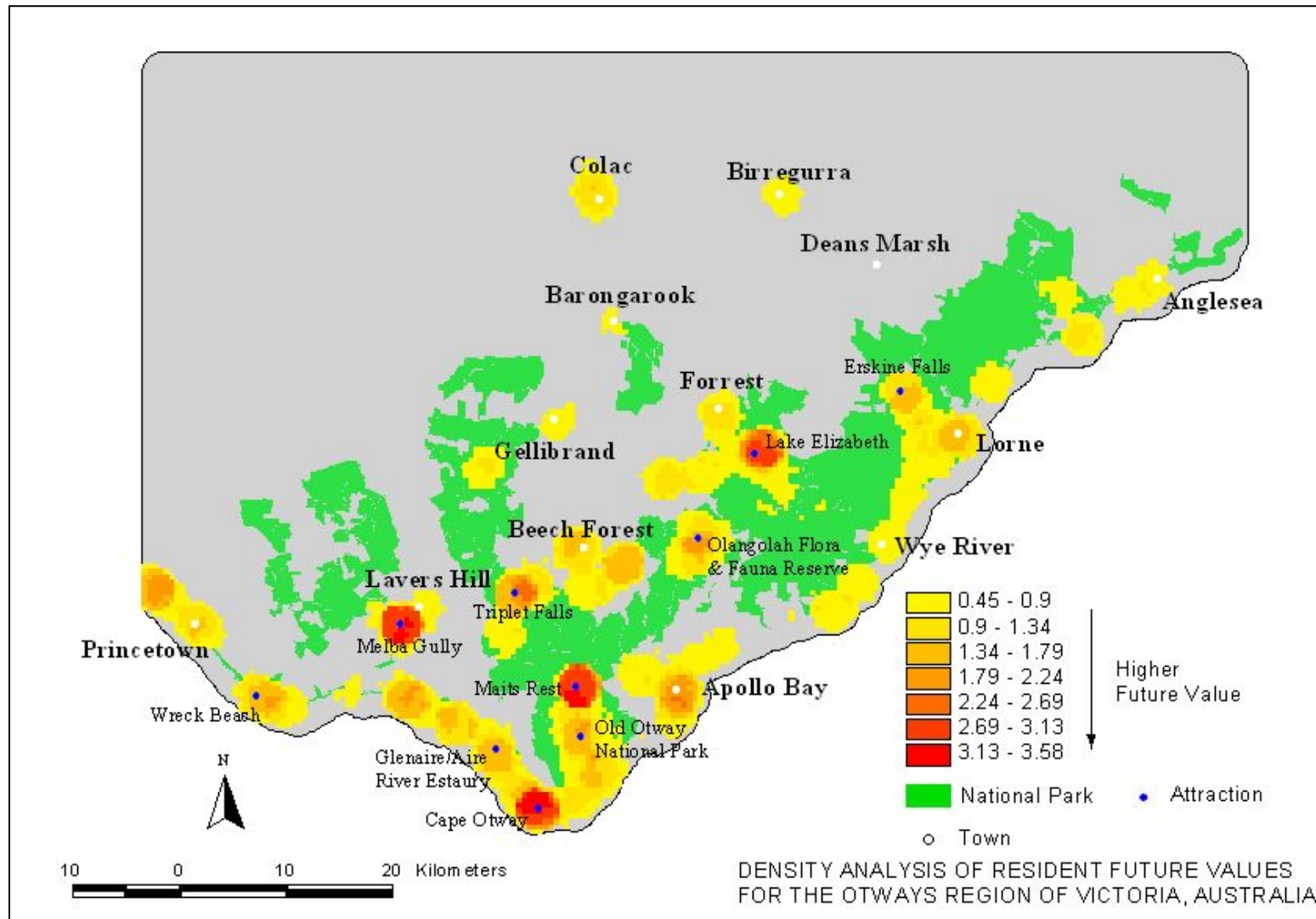
Appendix L: Density Map of Intrinsic Values
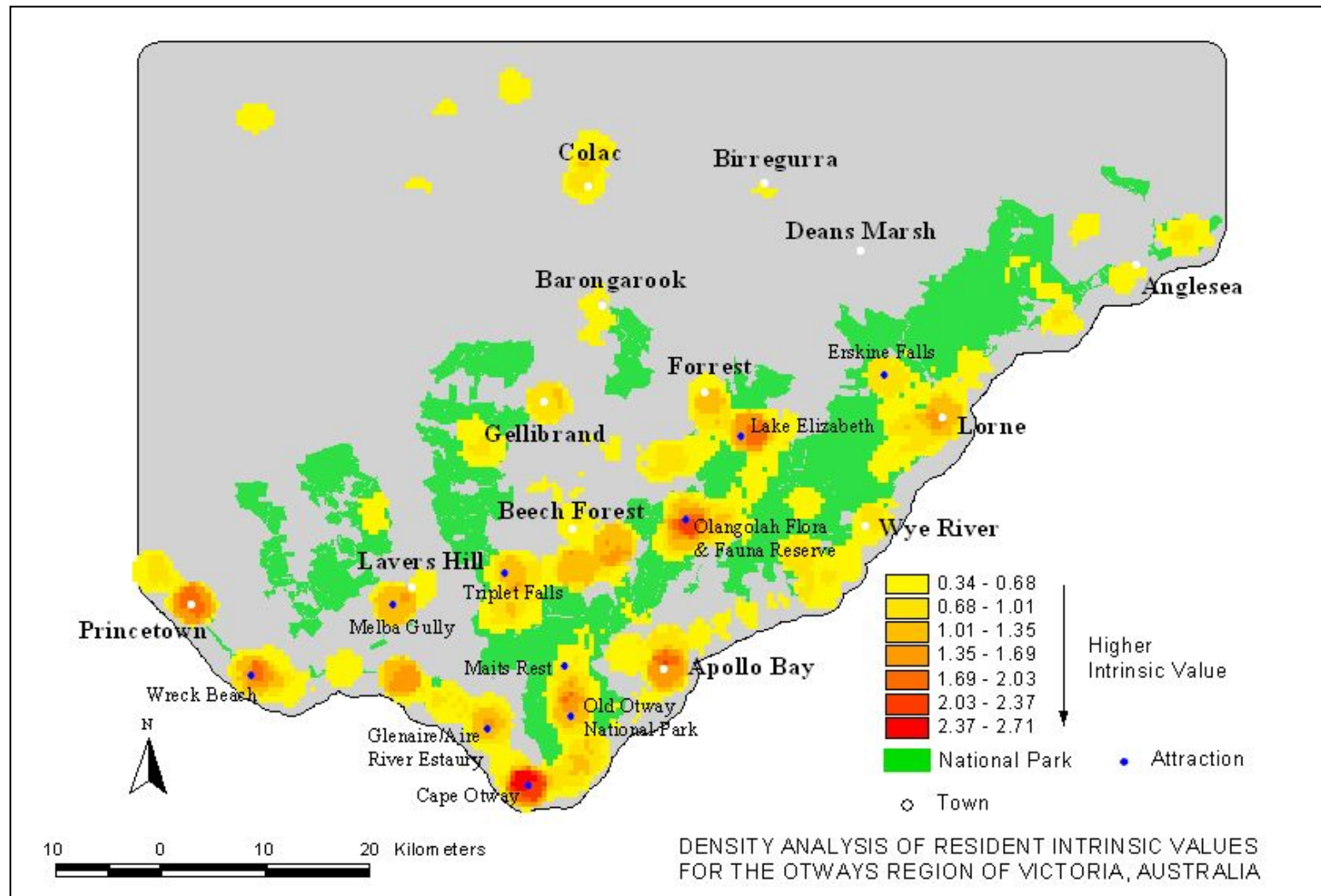
Appendix M: Density Map of Learning/Knowledge Values

Colac
Birregurra
Deans Marsh
Barongarook
Anglesea
Forrest
Erskine Falls
Gellibrand
Lake Elizabeth
Lorne
Beech Forest
Olangolah Flora & Fauna Reserve
Wye River
Lavers Hill
Triplet Falls
Melba Gully
Princetown
Maits Rest
Apollo Bay
Wreck Beach
Old Otway National Park
Glenaire/Aire River Estaury
Cape Otway

N

	0.52 - 1.03
	1.03 - 1.55
	1.55 - 2.07
	2.07 - 2.59
	2.59 - 3.10
	3.10 - 3.62
	3.62 - 4.14

Higher Knowledge Value

National Park • Attraction

o Town

10   0   10   20 Kilometers

DENSITY ANALYSIS OF RESIDENT KNOWLEDGE VALUES
FOR THE OTWAYS REGION OF VICTORIA, AUSTRALIA

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Appendix N: Density Map of Therapeutic Values

Colac
Birregurra
Deans Marsh
Barongarook
Anglesea
Forrest
Erskine Falls
Gellibrand
Lake Elizabeth
Lorne
Beech Forest
Olangolah Flora & Fauna Reserve
Wye River
Lavers Hill
Triplet Falls
Princetown
Melba Gully
Maits Rest
Apollo Bay
Wreck Beach
Old Otway National Park
Glenaire/Aire River Estuary
Cape Otway

0.38 - 0.76
0.76 - 1.13
1.13 - 1.51
1.51 - 1.89
1.89 - 2.27
2.27 - 2.65
2.65 - 3.02

Higher Therapeutic Value

National Park   Attraction
Town

10   0   10   20   Kilometers

DENSITY ANALYSIS OF RESIDENT THERAPEUTIC VALUES
FOR THE OTWAYS REGION OF VICTORIA, AUSTRALIA

Appendix O: Density Map of Heritage Values
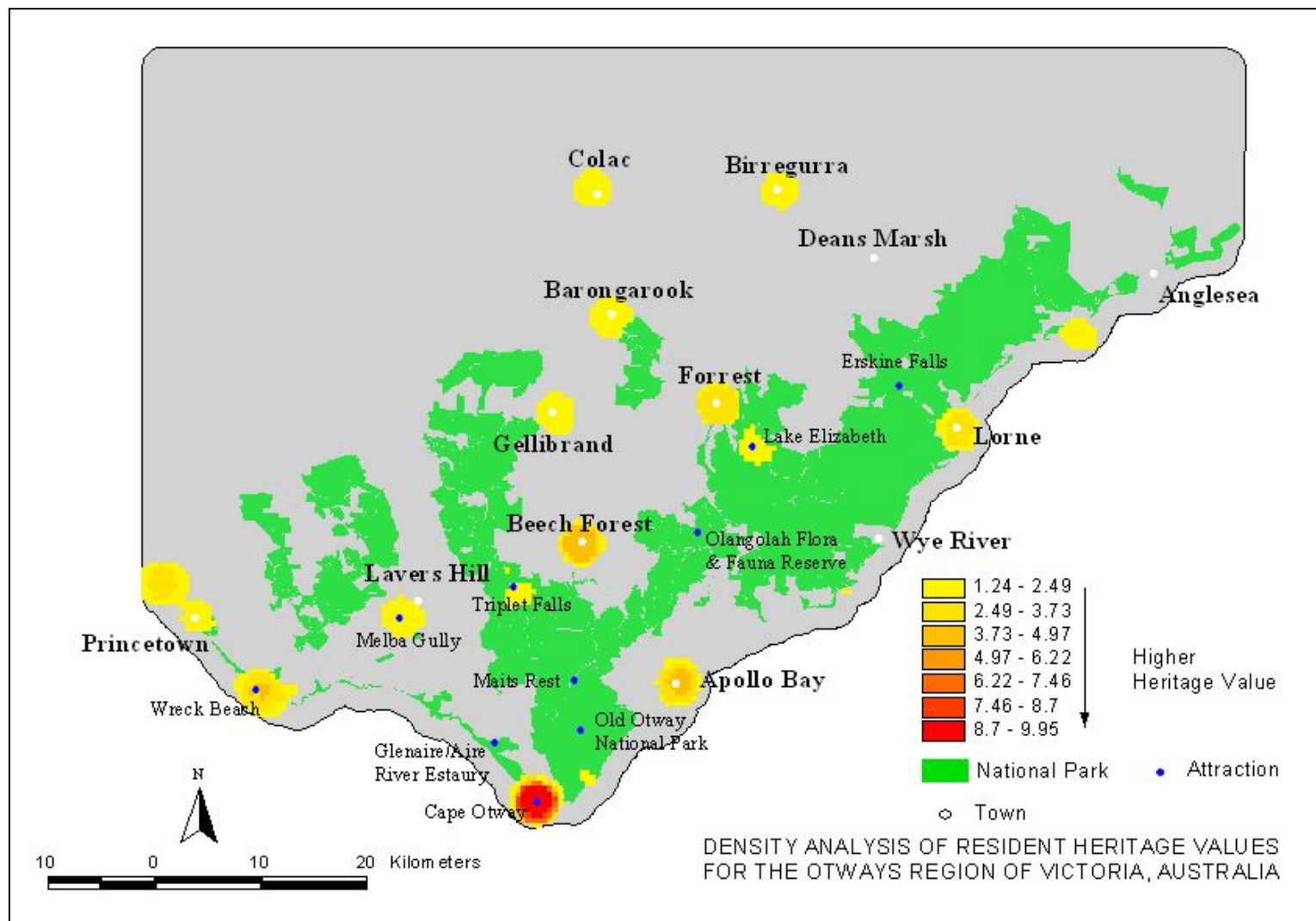
Appendix P: Density Map of Special Places

DENSITY ANALYSIS OF RESIDENT SPECIAL PLACES IN
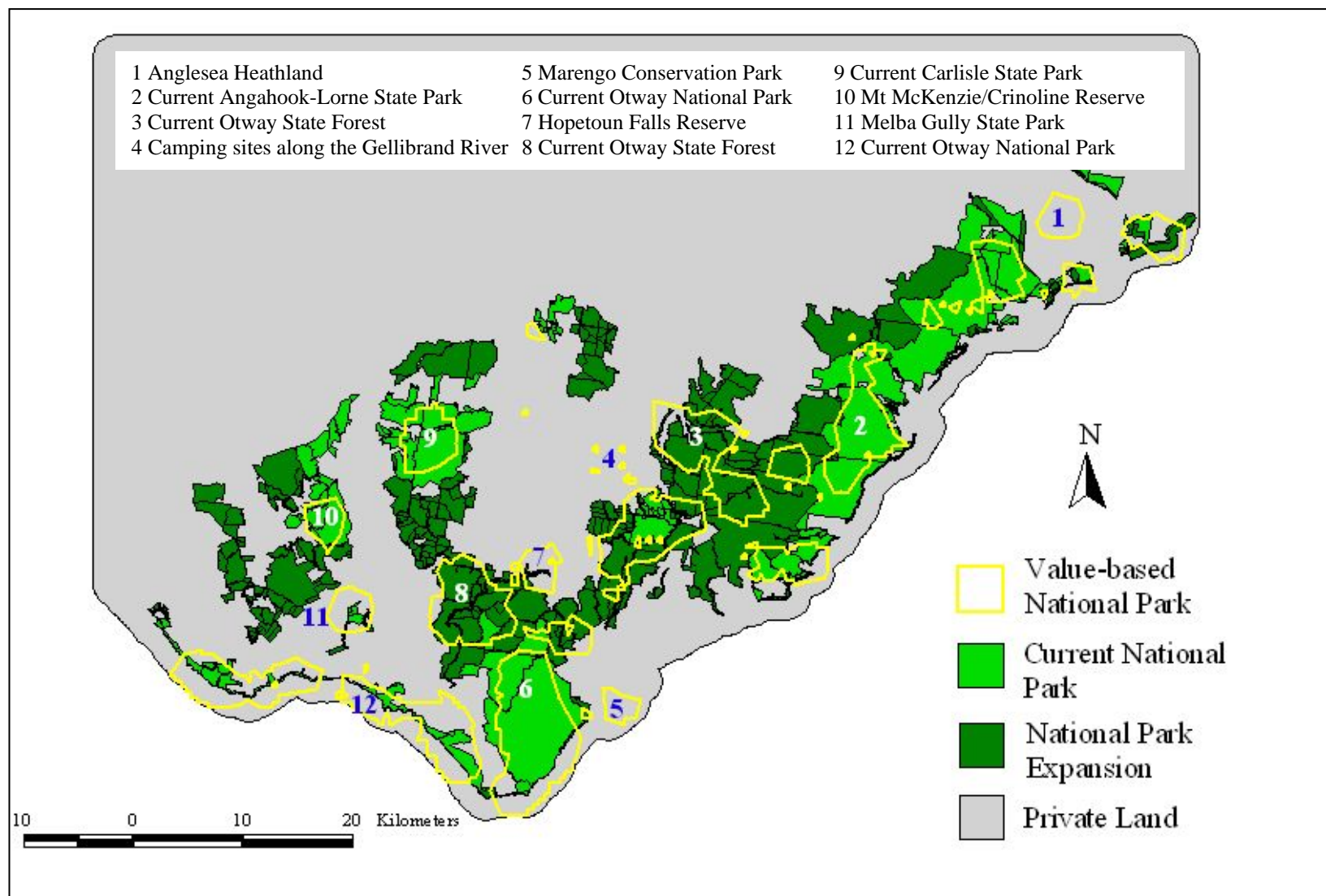THE OTWAYS REGION OF VICTORIA, AUSTRALIA
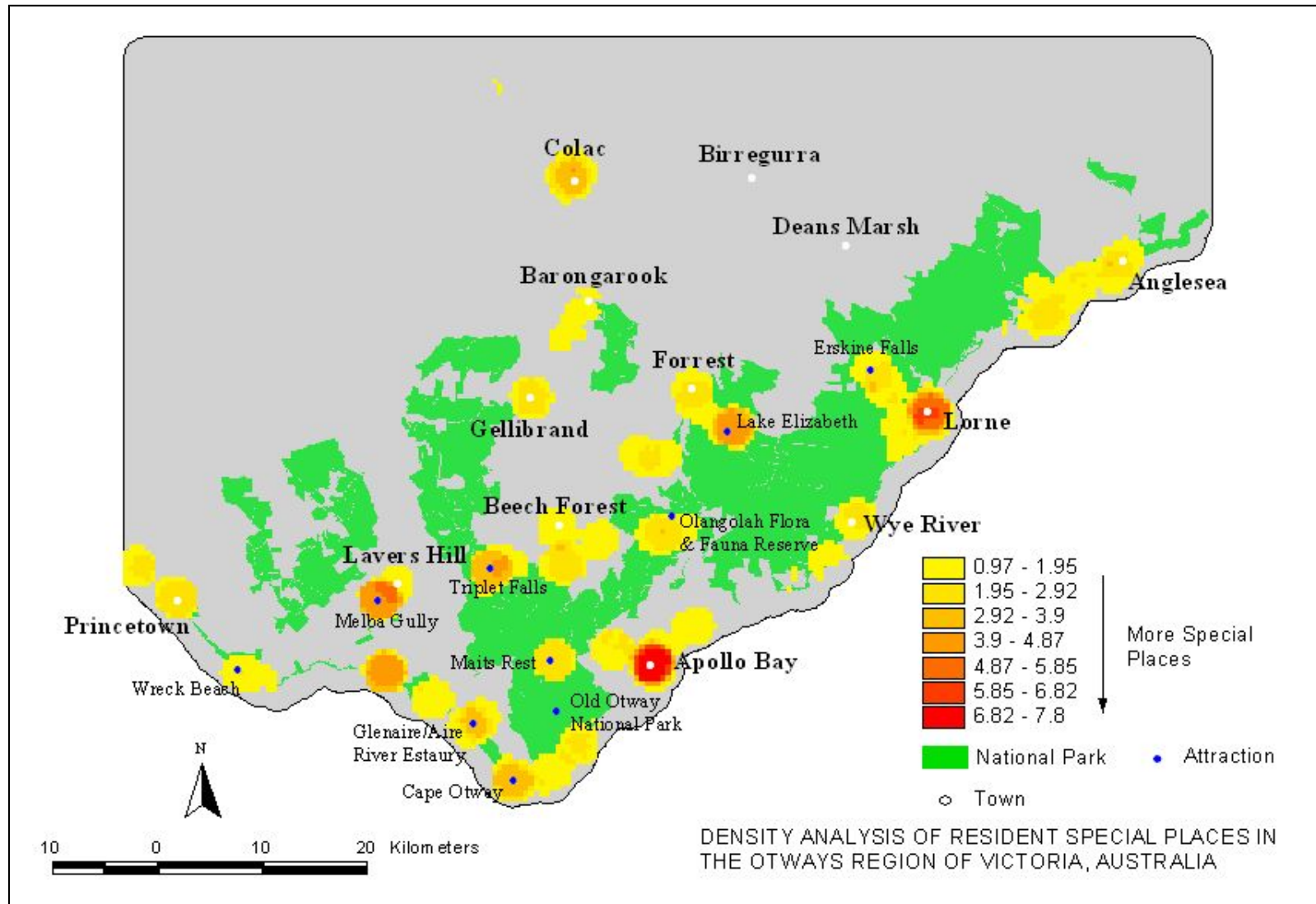
Appendix Q: Density Map of Resident Development Preferences
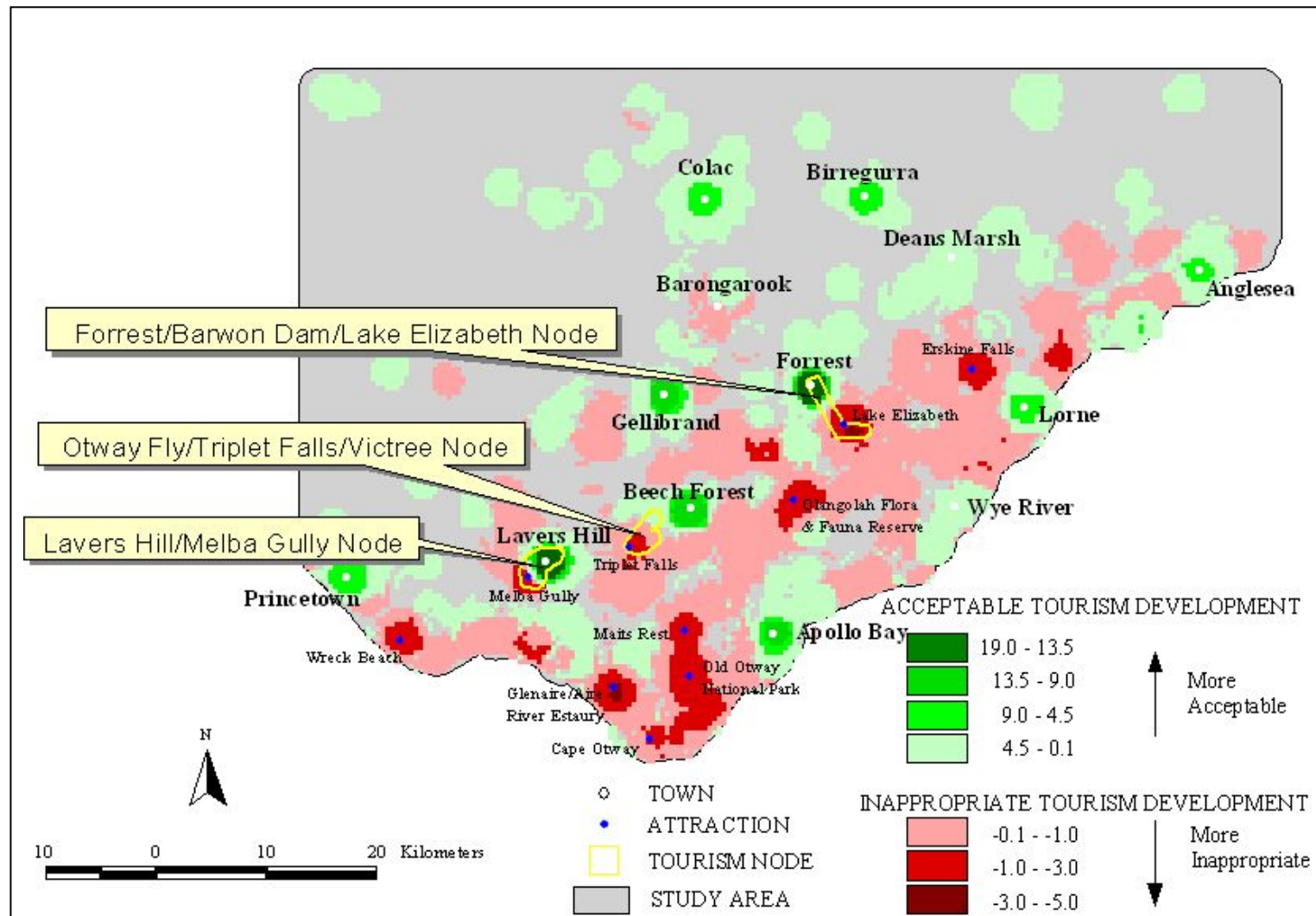
Appendix R: Density Map of Visitor Development Preferences
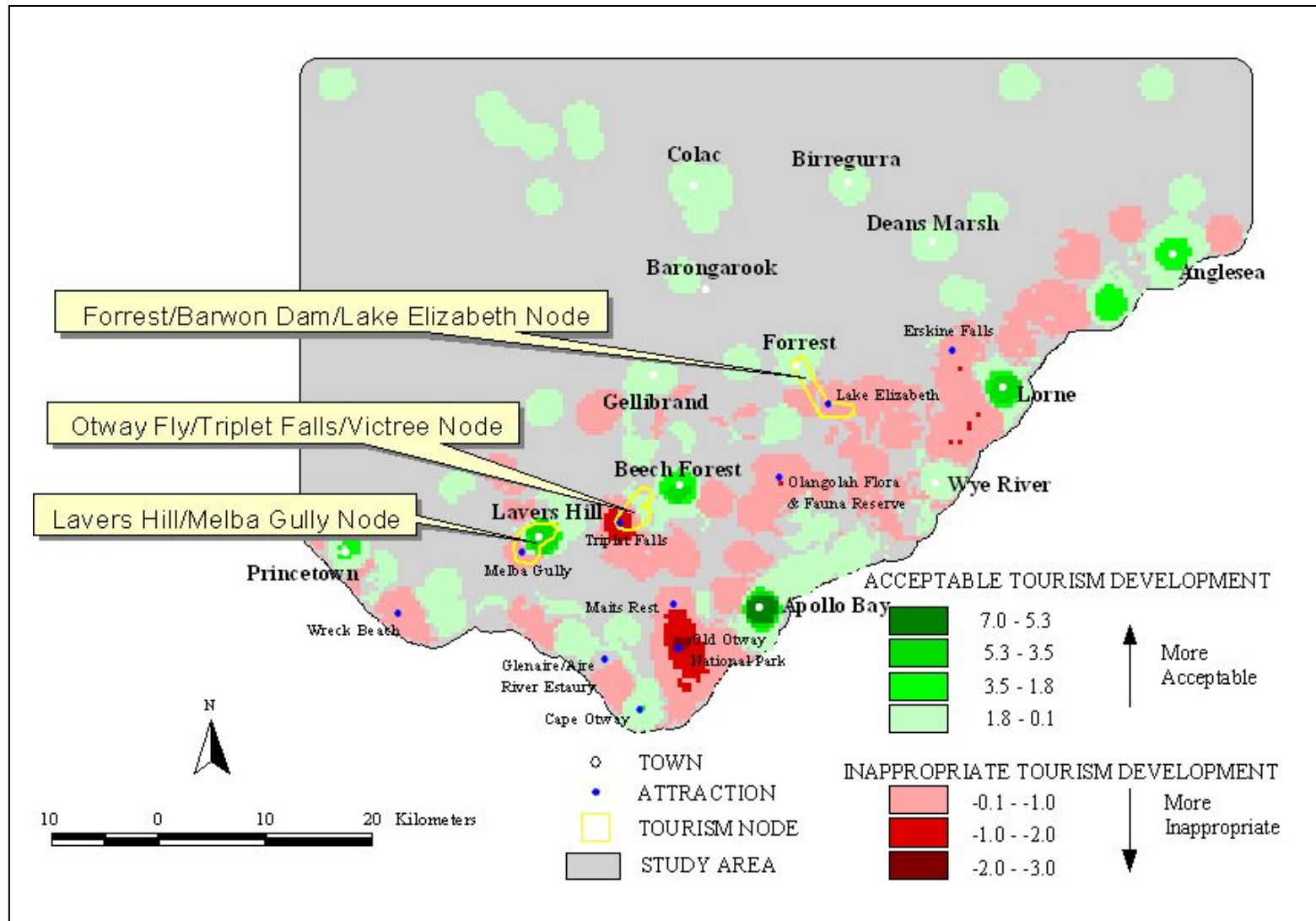
Appendix S: Map of National Parks Based On Landscape Values

1 Anglesea Heathland
2 Current Angahook-Lorne State Park
3 Current Otway State Forest
4 Camping sites along the Gellibrand River

5 Marengo Conservation Park
6 Current Otway National Park
7 Hopetoun Falls Reserve
8 Current Otway State Forest

9 Current Carlisle State Park
10 Mt McKenzie/Crinoline Reserve
11 Melba Gully State Park
12 Current Otway National Park

N

10   0   10   20   Kilometers

Value-based National Park

Current National Park

National Park Expansion

Private Land

References

Altman, I., and S.M. Low (Eds). 1992. Place attachment: New York: Plennum Press.

Australian Electoral Commission. 2003. Electoral Roll for the Division of Corangamite. Canberra: Commonwealth of Australia.

Australian Local Government Association. 2004. Sustainability, Local Agenda 21, and WSSD. <http://www.alga.asn.au/policy/environment/localAgenda21.php> (10 July 2005).

Brown, G. 2003. A method for assessing highway qualities to integrate values in highway planning. Journal of Transport Geography 11:271-283.

Brown, G. 2005. Mapping spatial attributes in survey research for natural resource management: methods and applications. Society and Natural Resources 18(1):17-39.

Brown, G., and L. Alessa. 2005. A GIS-based inductive study of wilderness values. International Journal of Wilderness 11(1):14-18.

Brown, G. and S. Hale. 2004. The Future of Kangaroo Island: Results of a Kangaroo Island Resident Survey. October 1, 2004. University of South Australia.

Brown, G., and P. Reed. 2000. Validation of a forest values typology for use in national forest planning. Forest Science 46(2):240-247.

Brown, G., P. Reed, and C. Harris. 2002. Testing a place-based theory for environmental evaluation: an Alaska case study. Applied Geography 22:49-76.

Brown, G., C. Smith, L. Alessa, and A. Kliskey. 2004. A comparison of perceptions of biological value with scientific assessment of biological importance. Applied Geography 24:161-180.

Burrough, P.A., and R.A. McDonnell. 2000. Principles of Geographical Information Systems. Oxford University Press: New York.

Butler, R. 1980. The concept of a tourist area life cycle of evolution: implications for management of resources. Canadian Geographer 19(1):5-12.

Cohen, R. and P. Kennedy. 2000. Global sociology. Basingstoke, U.K: Macmillan Press.

Dillman, D. 1978. Mail and telephone surveys. New York: John Wiley and Sons.

Dixon, J., and K. Durrheim. 2000. Displacing place-identity: a discursive approach to locating self and other. British Journal of Social Psychology 39:27-44.

Dredge, D. 1999. Destination place planning and design. Annals of Tourism Research 26(4):772-791.

DSE (Department of Sustainability and Environment, Victoria). 2003. Tourism Plan for the Public Land within the Otway Hinterland (Draft). Melbourne: Missing Link Consultancy.

Field, A. 2000. Discovering Statistics using SPSS for Windows 2000. London: Sage Publications.

Fishwick, L., and J. Vining. 1992. Toward a phenomenology of recreation place. Journal of Environmental Psychology 12:57-63.

Forrester, J. 1989. Planning in the face of power. Berkeley: University of California Press.

Garrod, B. 2003. Local participation in the planning and management of ecotourism: A revised model approach. Journal of Ecotourism 2(1):33-53.

Giuliani, M.V., and R. Feldman. 1993. Place attachment in a developmental and cultural context. Journal of Environmental Psychology 13:267-274.

Graburn, N.H. 1989. Tourism: The sacred journey. In Hosts and guests: The anthropology of tourism, 2nd edn., eds., V.L. Smith, 21-36. Philadelphia: University of Pennsylvania Press.

Gunn, C. 1993. Tourism Planning: Basics, Concepts and Cases. Washington: Francis and Taylor.

Higgins-Desbiolles, F. 2005. More than an 'industry': the forgotten power of tourism as a social force. Journal of Tourism Management (in press).

Inskeep, B. 1991. Tourism Planning: An Integrated and Sustainable Development Approach. New York: Van Nostrand Reinhold.

Jacob, G.R., and R. Schreyer. 1981. Conflict in outdoor recreation – a theoretical perspective. Journal of Leisure Research 12:368-380.

Jorgensen, B.S., and R.C. Stedman. 2001. Sense of place as an attitude: lakeshore owners attitudes toward their properties. Journal of Environmental Psychology 21:233-248

Kaltenborn, B.P. 1998. Effects of sense of place on responses to environmental impacts. Applied Geography18 (2):169-189.

Kaltenborn, B.P., and D.R. Williams. 2002. The meaning of place: attachments to Femundsmarka National Park, Norway, among tourists and locals. Norwegian Journal of Geography 56:189-198.

Kyle, G.T., J.D. Absher, and A.R. Graefe. 2003. The moderating role of place attachment on the relationship between attitudes toward fees and spending preferences. Leisure Sciences 25:33-50.

Kyle, G., A. Graefe, R. Manning, and J. Bacon. 2004. Effect of activity involvement and place attachment on recreationists' perceptions of setting density. Journal of Leisure Research 36(2):209-231.

Leiper, N. 1990. Tourist attraction systems. Annals of Tourism Research 17:367-384.

Leiper, N. 1995. Tourism Management. Melbourne: RMIT Press.

Manzo, L. C. 2003. Beyond house and haven: Toward a revisioning of emotional relationships with places. Journal of Environmental Psychology 23:47-61.

McGuirk, P.M. 2001. Situating communicative planning theory: context, power, and knowledge. Environment and Planning A 33:195-217.

Moore, R.L., and A.R. Graefe. 1994. Attachment to recreation settings: The case of rail-trail users. Leisure Sciences 16:17-31.

Paton, S., A. Curtis, G. McDonald, and M. Woods. 2004. Regional natural resource management: Is it sustainable? Australasian Journal of Environmental Management 11(4):259-267.

Proshansky, H. M., A.K. Fabian, and R. Kaminoff. 1983. Place-identity: Physical world socialization of the self. Journal of Environmental Psychology 3:57-83.

Reed, P., and G. Brown. 2003. Values suitability analysis: A methodology for identifying and integrating public perceptions of ecosystem values in forest planning. Journal of Environmental Planning and Management 46(5):643-658.

Relph, E. 1976. Place and placelessness. London: Pion Limited.

Richardson, J. 1993. Ecotourism and nature-based holidays. Sydney: Simon and Schuster.

Salant, P., and D. Dillman. 1994. How to Conduct your Own Survey. New York: John Wiley & Sons.

Shamai, S. 1991. Sense of Place: An empirical measurement. Geoforum 22:347-358.

Schreyer, R., G. Jacob, and R. White. 1981. Environmental meaning as a determinant of spatial behaviour in recreation. Proceedings Applied Geography Conference 4:294-300.

Spatial Vision. 2001. Visitors map for the Parks, Coasts and Forests of the Great Ocean Road and Otway Ranges. Melbourne: Spatial Vision.

Star, J., and J. Estes. 1990. Geographic Information Systems an Introduction. Prentice-Hall: Englewood Cliffs, New Jersey.

Stedman, R.C. 2003. Is it really just a social construction? The contribution of the physical environment to sense of place. Society and Natural Resources 16:671-685.

VEAC (Victorian Environmental Assessment Council). 2004. Angahook-Otway Investigation Final Report. Melbourne: Victorian Environmental Assessment Council.

Williams, D.R., and M.E. Patterson. 1996. Environment meaning and ecosystem management: perspectives from environmental psychology and human geography. Society and Natural Resources 9:507-521.

Williams, D.R., M.E. Patterson, J.W. Roggenbuck, and A.E. Watson. 1992. Beyond the commodity metaphor: Examining emotional and symbolic attachment to place. Leisure Sciences 14:29-46.

Williams, D.R., and J.W. Roggenbuck. 1989. Measuring place attachment: Some preliminary results. In Abstracts of the 1989 Symposium on Leisure Research. Alexandria, VA: National Recreation and Park Association.

Williams, D.R., and S.I. Stewart. 1998. Sense of place: an elusive concept that is finding a home in ecosystem management. Journal of Forestry 96(5):18-23.

Williams, D.R., and J.J. Vaske. 2003. The measurement of place attachment: validity and generalisability of a psychometric approach. Forest Science, 49(6):830-840.

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