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Mapping Landscape Values and Development Preferences: a Method for Tourism and Residential Development Planning

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ABSTRACT

This paper presents a method for measuring and analysing tourism and residential development options using survey research techniques that spatially locate public-perceived landscape values and development preferences. Using survey data from Kangaroo Island, South Australia, landscape values and preferences for tourism development are analysed to determine the relative strength of landscape values as predictors of place-specific development preferences. Results indicate that tourism development preferences are most closely associated with recreation, economic and scenic landscape values whereas residential development preferences are most closely associated with recreation, economic and learning values. Preferences for 'no development' are most closely associated with wilderness, therapeutic and intrinsic landscape values. A simple development index is generated from the spatial data that ranges from positive (acceptable development) to negative (no development) values. The potential benefits of the method for land-use planning processes are discussed.

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INTRODUCTION

Land use and development decisions are consistently among the most important decisions at the community level because they are perceived to have direct linkages to resident quality of life. The particular type of development can strongly influence the nature of the community response. Whereas increased residential development often appears consistent with the prevailing human population growth paradigm (the 'people have to live somewhere' argument), tourism-related development often lacks the same inevitability because of implied community choice regarding the type of economic development to be encouraged. Consequently, tourism-related development decisions can be particularly contentious because these are viewed as more discretionary and non-essential from a community perspective.

One of the larger challenges for tourism planning and development is integration with the prevailing local land-use planning and political decision-making bodies where actual zoning and development approval decisions are made. The gulf between tourism planning processes that occur at regional or state levels, and local government decisions, can be quite large. Even if tourism plans attract the requisite investment interest to generate targeted development proposals, the proposals can be defeated or significantly altered during the local development approval process. Similarly, development proposals can be expanded in the local development review process as new opportunities and alliances are identified. Proposed development success cannot be guaranteed, even when such proposals are consistent with community, regional or state tourism development plans. Each development proposal, when coming before a local council or equivalent approval board, will be positioned by opponents as a discrete decision to be judged on its own merits and divorced from any larger planning efforts that are generally supportive of future growth. Development proponents will, inevitably, invoke the arguments of employment opportunities and community economic benefits. Both proponents and opponents of community development proposals will claim to represent community values.

Although tourism has become a global component of economic development, the linkage to community land-use planning process is, at best, underdeveloped. Harrill (2004) notes that despite increased interest in residents' attitudes toward tourism development, 'only a handful of articles on tourism planning have found their way into the planning literature' (p. 251), and Dredge (1999) observes that 'despite considerable advancement in the development of methodological processes of tourism planning . . . there is a lack of spatial concepts, models, and theories from which the land use planner can draw' (p. 773). Further, the application of geographical information systems (GIS) in tourism research has been 'minimal' despite being discussed for over a decade (Allen *et al*., 2002) and 'neglected' as a decision support system for sustainable tourism development (Farsari, 2003). Beyond basic map production and data assembly, there are few examples of the direct use of GIS to support the 'resolution of more complex and higher level strategic decision problems, such as the creation of a long term development plan' (Feick and Hall, 1999, p. 18).

Although GIS has the capacity to help identify location suitability considering conflicting or complimentary land uses (Butler, 1993; Behaire and Elliott-White, 1999), the types of objects typically inventoried for analysis are physical landscape characteristics (see e.g. Boyd and Butler, 1996), and not the values and preferences of local residents or visitors to an area. This avoidance stems from at least two sources: public value and preference data are not readily available in a spatially explicit form, and even if available, data integration with 'hard' or definitive landscape features would be 'messy' given the high spatial variability of value and preference data. The contribution of this paper is to provide a partial way forward by demonstrating that it is possible to map public landscape values and development preferences with the potential to bridge the chasm between expert-driven land-use planning processes on the one hand, and community-driven, collaborative tourism planning on the other.

Kangaroo Island in South Australia has opted to promote a tourism planning model called the Tourism Optimisation Management Model (TOMM) (Mandis Roberts Consultants 1997). The TOMM is a community-based initiative responsible for monitoring the long-term health of the tourism industry on Kangaroo Island and was designed specifically for tourism planning in natural areas. The objectives of the model are to monitor and quantify the key benefits and impacts of tourism activity, and assist in assessing emerging issues and alternative future options for sustainable tourism. The TOMM developed a vision for the tourism industry stating that 'KI will be one of the world's pre-eminent nature-based tourism destinations, with a strong rural industry selling its products to the tourism, mainland and overseas market, a high quality of life for residents, and well managed resources' (Jack, not dated). The TOMM was developed not only to monitor tourism activity and impacts, but also to help the community make better decisions about tourism.

To create better information and linkages between community values and government choice regarding land use, the measurement of landscape values and special places for regional and natural resource planning has been the subject of several regional planning studies. The various planning applications are summarised by Brown (2005) and have included national forest management (Reed and Brown, 2003), identifying areas for

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biological conservation (Brown *et al*., 2004), scenic highway nomination (Brown, 2003) and wilderness quality analysis (Brown and Alessa, 2005). Thus far, no attempt has been made to use the spatial survey method to determine the suitability of land areas for tourism and residential development.

This study presents a spatially oriented resident view of development preferences on Kangaroo Island, South Australia. Like many places worldwide, the island is perceived to be both an attractive destination and a region that provides high quality-of-life for residents. By asking residents to map landscape values and places perceived to be appropriate and inappropriate for both residential and tourism development, the relationships between perceived landscape values and resident development preferences can be made explicit. Further, maps can be generated from the spatial data that show areas of resident agreement or disagreement regarding future development on the island. These maps can be overlaid with existing zoning plans to assess the consistency of current zoning designations or to act as conservation or development overlay zones for land use planning.

Before resident spatial data is used for conservation and development planning, it is essential that the nature of the spatial data, and its strengths and limitations be fully understood. The purpose of this paper has four primary objectives:

(i) to describe the characteristics (frequency, abundance, distribution) of landscape values and development preferences on Kangaroo Island, and where possible, compare these with other published spatial survey results;
(ii) to determine which perceived landscape values best predict residential and tourism development preferences using multiple linear regression;
(iii) to develop a simple GIS decision model that generates descriptive maps showing resident preferences for both tourism and residential development on Kangaroo Island;
(iv) to describe how the spatial information can be integrated with existing land use planning methods to improve land use planning decisions.

METHODS

Survey methods

The Kangaroo Island (KI) planning survey was implemented in 2004 using a modified total design survey methodology (Dillman, 1978). A survey booklet, consisting of five sections, along with a greyscale KI map was sent to 1000 KI households randomly selected from voter registration rolls. A total of 431 usable responses were received for an overall response rate of 47% after adjusting for nondeliverable surveys. About 91% of those completing the survey also completed spatial mapping questions asking residents to identify landscape values and place-specific development preferences on KI.

Of relevance to this study was the part of the survey that asked participants to place mnemonically coded sticker dots representing 12 predefined landscape values and dots representing three types of development preferences on a map provided with the survey package. The typology of landscape values and development preference options is shown in Figure 1. For landscape values, survey participants were instructed to place the coded sticker dots on the enclosed Kangaroo Island map where they believe the landscape values are located. Survey participants were also asked to indicate three development preferences as follows:

(i) places where all future development should be prohibited;
(ii) places where *residential* development could conditionally occur with a good plan;
(iii) places where *tourism* development could conditionally occur with a good plan.

Upon return, the landscape values and development preference locations were digitised using ArcView® GIS software. A total of 391 maps were returned with 22 424 point locations digitised for analysis.

Analysis methods

To describe the distribution of landscape values and development preferences on Kangaroo Island, nearest neighbour analysis was

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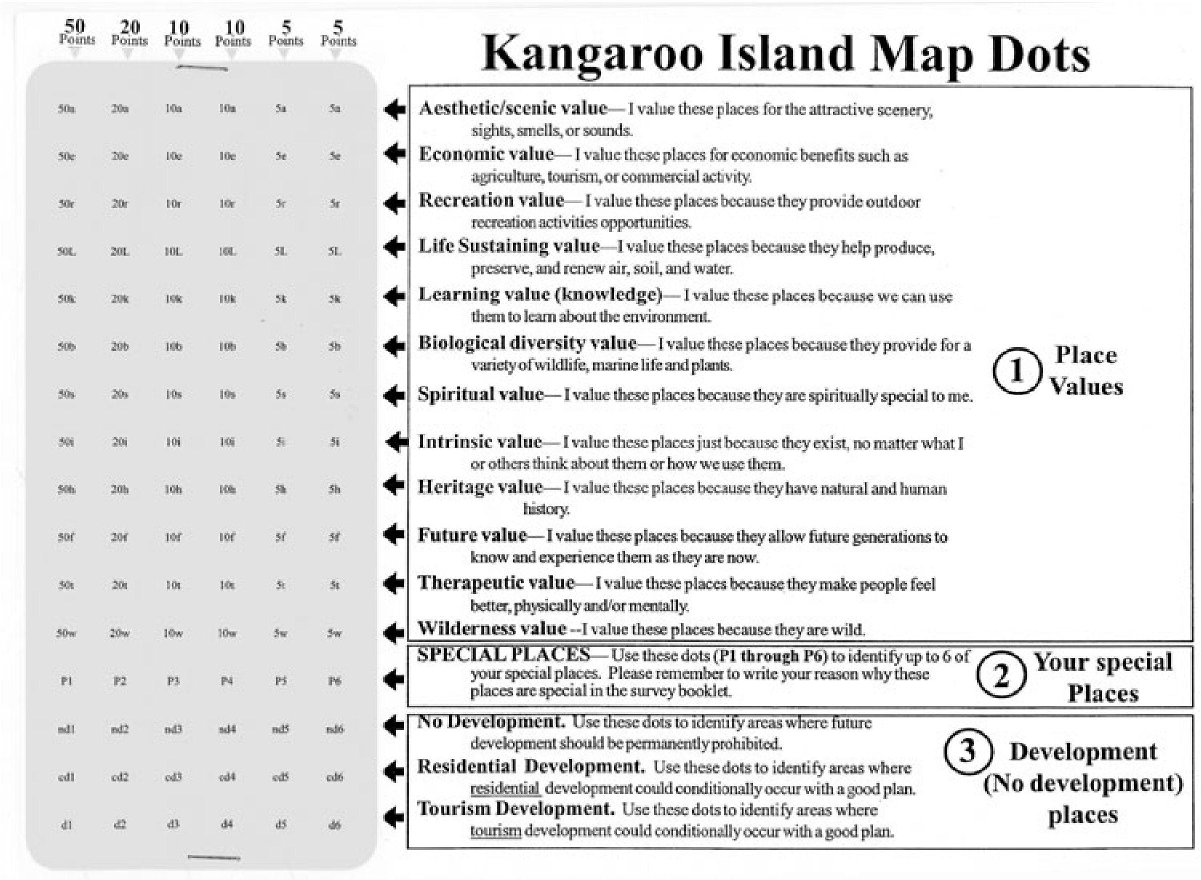

Figure 1. Mnemonic sticker dots and landscape value legend used in Kangaroo Island survey.

performed for each set of landscape values and development preferences. Nearest neighbour analysis provides a global measure of the point distribution and tests the hypothesis that each distribution is completely spatially random (CSR). The analysis produces an *R* statistic that is a ratio of observed distances between points to the expected distances between points if the points were randomly distributed. The *R* scale ranges from $R = 0$ (completely clustered) to $R = 1$ (random) to $R = 2.149$ (completely dispersed). From the *R* statistic, a standardised *z* score can be computed to test the hypothesis that the point distribution deviates from randomness, either toward clustering or uniformity. *z* scores greater than ±1.96 (95% confidence level) lead to rejection of the null hypothesis of random point distribution. Nearest neighbour results from three other regional studies of landscape values are provided for comparison with the KI results.

Multiple regression analysis

To determine the relationship between landscape values and the various development preferences, multiple regression was performed treating landscape values as independent, predictor variables, and development preferences as dependent variables. To conduct the multiple regression analysis on development preferences, some preliminary data preparation was required. A study area polygon was established to capture most respondent-identified point locations, but to exclude obvious point outliers. The selected study area polygon consisted of the Kangaroo Island coastline buffered to 3000 m offshore. Each of the 12 landscape value and three development preference point distributions were then converted to raster data (grids) in ArcView Spatial Analyst® by calculating the density of point locations using a consistent

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density criteria (500 m grid cell, 2000 m search radius). Each grid was then clipped to the study area polygon resulting in 23 147 grid cells for analysis.

Each grid cell represents three values (*x*, *y*, *z*) with *x* and *y* denoting unique spatial coordinates (latitude and longitude) and *z* denoting a calculated landscape value point density or a development preference point density. Thus, a given grid cell would have 12 separate landscape value densities and three development preference densities associated with it. The 15 density grids were exported as (*x*, *y*, *z*) data and imported into SPSS® for multiple regression analysis.

The purpose of the regression analysis was to determine the relative strength of the predictor variables (landscape values) in determining development preferences, not to validate a development preference model *per se*. With the development preference density variables as the dependent variable, multiple regression was performed with the 12 landscape value densities as independent variables. Lacking sound theoretical reasons for including or excluding predictors in the regression model, the 'stepwise' method of regression was chosen to select predictors based on a purely mathematical criterion. The primary methodological concern is with the expected collinearity that can influence the importance of predictor variables shown by the model's standardised beta coefficients. In the absence of serious collinearity problems, the larger the absolute value of the standardised beta coefficients, the stronger the spatial association of the landscape value to the development preference.

Modelling and mapping development preferences

To model development preferences on Kangaroo Island, the density grid representing 'no development' preferences was mathematically subtracted from each of the density grids representing acceptable tourism and residential development preferences. The result is a new map with grids cells that reflect the difference between acceptable development and 'no development' point densities. The difference constitutes a simple 'development index' that ranges on a continuum from acceptable development preferences (positive values) to 'no development' preferences (negative values). A decision rule can be adopted about the public acceptability of future development proposals in particular areas based on the development index values. For purposes of illustration, a simple decision rule and set of maps is presented herein. 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 development index is positive, the type of development represented by the index should be encouraged. Development index values close to zero represent land areas of public ambivalence toward the general type of development being analysed, either tourism or residential development.

RESULTS

Nearest neighbour analysis of landscape values and development preferences

The results of nearest neighbour analysis for all respondents and a test of the hypothesis that the point distributions are CSR are shown in Table 1. For every landscape value and development preference, the null hypothesis of CSR is rejected indicating a tendency toward clustering.

Despite the overall tendency toward clustering, there are differences in the relative clustering of values. For example, aesthetic/scenic and recreation values are the most clustered landscape values (R = 0.38 and 0.45 respectively) whereas the most disbursed values are life sustaining and spiritual values (R = 0.61 and 0.63 respectively). For illustrative purposes, the distributions of two landscape values (scenic and life sustaining) are presented in Figure 2. Perceived scenic values are seen to cluster primarily along the coast whereas life sustaining values are more dispersed on the island including inland areas. As evident from the map, a significant percentage of life sustaining values are located within or near designated conservation areas and national parks on the island.

The residential (R = 0.36) and tourism development preferences (R = 0.48) are much more

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Table 1. Completely spatial random hypothesis testing of landscape values using nearest neighbour analysis

Landscape Value	Number of observations	R value and rank	z value	H_0: values are CSR	Chugach NF Study (1998)[a] R value and rank	Prince William Sound Study (2001)[b] R value and rank	Kenai Coastal Study (2002)[c] R value and rank
Aesthetic	1904	0.380 (1)	–51.74	Reject	0.664 (1)	0.755 (4)	0.664 (4)
Economic	1525	0.455 (4)	–40.74	Reject	0.741 (5)	0.646 (1)	0.494 (1)
Recreation	1603	0.447 (2)	–42.31	Reject	0.675 (2)	0.709 (3)	0.648 (3)
Life sustaining	1053	0.605 (10)	–24.51	Reject	0.775 (10)	0.880 (9)	0.782 (8)
Learning	1234	0.495 (5)	–33.93	Reject	0.743 (6)	0.777 (5)	0.732 (7)
Biological diversity	1356	0.589 (8)	–28.97	Reject	0.763 (8)	0.797 (6)	0.681 (5)
Spiritual	908	0.626 (11)	–21.56	Reject	0.765 (9)	0.831 (7)	0.804 (10)
Intrinsic	1129	0.599 (9)	–25.77	Reject	0.828 (11)	0.894 (11)	0.794 (9)
Historic	1313	0.452 (3)	–37.00	Reject	0.670 (3)	0.657 (2)	0.518 (2)
Future	1255	0.559 (7)	–29.87	Reject	0.745 (7)	0.868 (8)	0.831 (11)
Subsistence	N/A	N/A	N/A	N/A	0.745	0.783	0.565
Therapeutic	1083	0.554 (6)	–28.07	Reject	0.720 (4)	0.891 (4)	0.728 (6)
Cultural	N/A	N/A	N/A	N/A	0.813	0.620	0.645
Wilderness	1441	0.556	–32.27	Reject	N/A	N/A	0.845
No development preference	1577	0.603	–30.12	Reject	N/A	N/A	N/A
Residential development preference	1542	0.356	–48.41	Reject	N/A	N/A	N/A
Tourism development preference	1452	0.480	–37.93	Reject	N/A	N/A	N/A

N/A — landscape value or preference not solicited in the study.
[a] Year of data collection. Source: Brown *et al*. (2002).
[b] Year of data collection. Source: Smith (2001).
[c] Year of data collection. Source: Brown, unpublished data.

clustered than the no development preferences (R = 0.60). The residential development preferences cluster around existing townships on Kangaroo Island and tourism preferences also cluster around townships and several coastal areas.

For purposes of contrast, Table 1 also contains nearest neighbour results from three other landscape value studies completed in Alaska (USA). The landscape values typology varied slightly between studies but the values were measured using similar definitions and methods. The comparison reveals that the majority of Kangaroo Island landscape values are more clustered (lower R values) than the same values measured in the Alaska studies. Because the KI study area is smaller than the Alaska study areas, there are fewer places in general on KI for residents to spatially locate their landscape values. Higher concentrations of landscape values are placed on relatively fewer available locations on Kangaroo Island. A second observation is that the spatial distribution of landscape values across all studies appear more similar than different based on the rankings of the computed R values within each study. Across all studies, aesthetic, recreation, historic and economic values tend to be the most clustered, whereas intrinsic, life sustaining, spiritual and future values tend to be the most dispersed. Therapeutic, learning, and biological diversity values fall in the middle of the clustered–dispersed continuum.

Landscape values as predictors of tourism and residential development preferences

The twelve values in the typology were used to predict spatial association with tourism devel-

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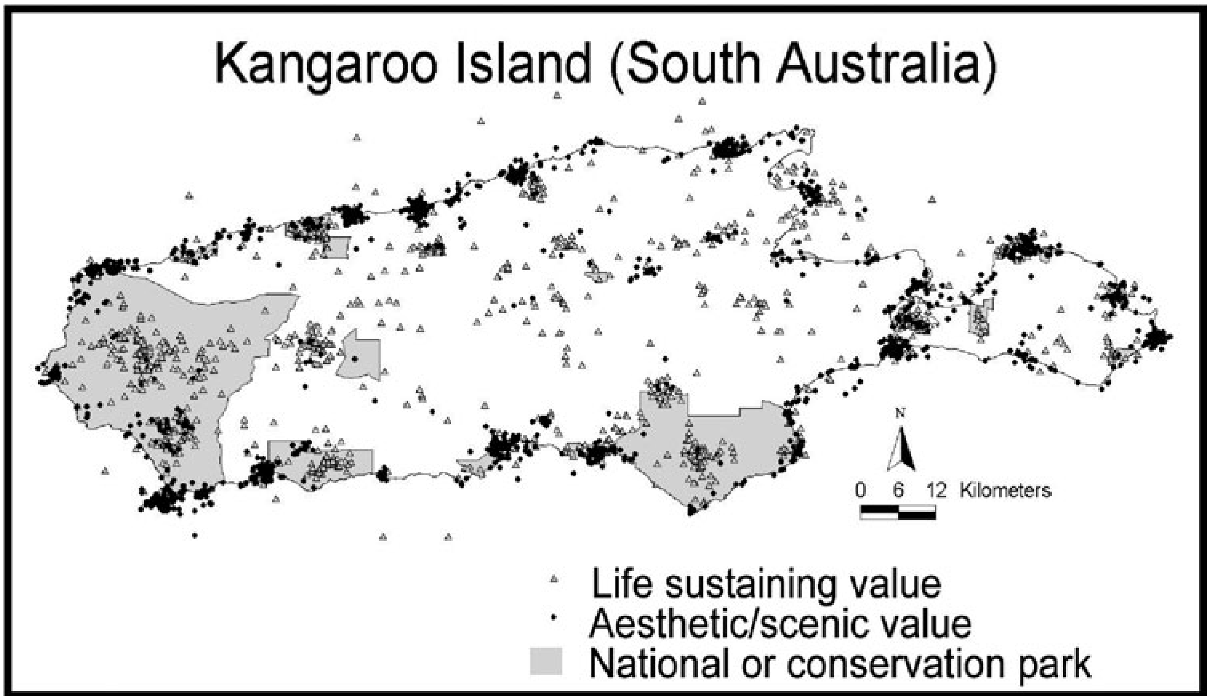

Figure 2. Spatial distribution of scenic and life sustaining values on Kangaroo Island.

opment preferences. Of the 12 predictor variables, 11 variables were found to be statistically significant predictors of tourism development preferences through stepwise regression (see Table 2). Only learning value locations were not predictive of tourism development preferences. The overall fit of the regression model was statistically significant ($R = 0.87$).

The standardised beta coefficients of the predictor variables indicate the relative strength and direction of relationship between landscape values and tourism development preferences. The most significant predictor variables were recreation ($\beta = 0.574$), economic ($\beta = 0.353$), scenic ($\beta = 0.223$), and heritage ($\beta = 0.148$) values, all of which were positively associated with tourism development locations. Future, intrinsic, spiritual, wilderness, therapeutic and biological diversity locations were negatively associated with tourism development.

The regression results for residential development were similar to the results for tourism development. Of the 12 predictor variables, 11 variables were statistically significant predictors of residential development using stepwise regression (see Table 2), with an overall model fit of $R = 0.82$. Only the intrinsic value was not predictive of residential development preferences, and similar to the tourism development results, recreation ($\beta = 0.519$), economic ($\beta = 0.473$) and heritage ($\beta = 0.141$) value locations were strongly associated with residential development preferences. The landscape values of future, spiritual, wilderness, therapeutic and biological diversity were negatively associated with residential development.

Collinearity diagnostics on the regression models suggest probable collinearity in the independent variables but this was not unexpected as landscape values are not presumed to be spatially independent. The collinearity diagnostics show weak independent variable dependencies with VIF values ranging from 1.6 to 7.2, below the threshold of 10 for obvious concern (Myers, 1990).

Landscape values as predictors of no development preferences

The 12 values in the typology were used to predict spatial association with 'no develop-

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Table 2. Standardised regression coefficients of landscape values as predictors of development preferences on Kangaroo Island. Absolute values of coefficient indicate relative strength of spatial association between each landscape value and development preferences

	Development preference		
Landscape value	No development	Tourism development	Residential development
Aesthetic	0.161 (4)	0.226 (3)	0.088
Economic	–0.065	0.353 (2)	0.473 (2)
Recreation	N/A	0.574 (1)	0.519 (1)
Life sustaining	0.106	0.069	0.067
Learning	0.113	N/A	–0.163 (3)
Biological diversity	0.139	–0.069	–0.063
Spiritual	N/A	–0.096	–0.044
Intrinsic	0.186 (3)	–0.049	N/A
Heritage	–0.079	0.148 (4)	0.141 (4)
Future	0.050	–0.076	–0.081
Therapeutic	0.204 (2)	–0.061	–0.117
Wilderness	0.213 (1)	–0.052	–0.052
Regression model fit *R*	0.841	0.871	0.821
R^2	0.708	0.759	0.673

N/A — landscape value was not a statistically significant ($p < 0.05$) predictor in regression.

ment' preferences. Of the 12 predictor variables, 10 variables were found to be statistically significant predictors of development preferences through stepwise regression (see Table 2). Recreation and spiritual value locations were not statistically significant predictors of development preferences. The overall fit of the regression model was statistically significant ($R = 0.84$).

The relative strength of predictor variables for 'no development' was more evenly distributed, with wilderness (β = 0.213), therapeutic (β = 0.204), intrinsic (β = 0.186), scenic (β = 0.161), biological diversity (β = 0.139), learning (β = 0.113), life sustaining (β = 0.106) and future (β = 0.050) values all being positively associated with no development preferences. Heritage and economic values were negatively associated with no development preferences.

A simple model of tourism development preferences

A map showing the development index values for tourism development is shown in Figure 3. The development index is a numeric value representing the difference in point densities for acceptable tourism development preferences and point densities for 'no development' preferences. The point densities were calculated based on the number of points within a 500 m grid cell and the number of points located in adjacent grid cells out to 2 km. From Figure 3, several observations about tourism development on Kangaroo Island can be made:

(i) The 'no development' preferences span most of the island coastline. Exceptions to the general preference for coastal protection occur in discrete and obvious places such as the coastal communities of Kingscote, Penneshaw, American River, Emu Bay, Vivonne Bay and the interior community of Pardana. Further, with the exception of Vivonne Bay in the west end, tourism development preferences are confined to the east end of the island;

(ii) Positive tourism development preferences occur outside existing conservation park locations whereas the most negative index values are located inside conservation parks;

(iii) Landscapes in the interior of the island are largely development neutral (index values near zero) with few development

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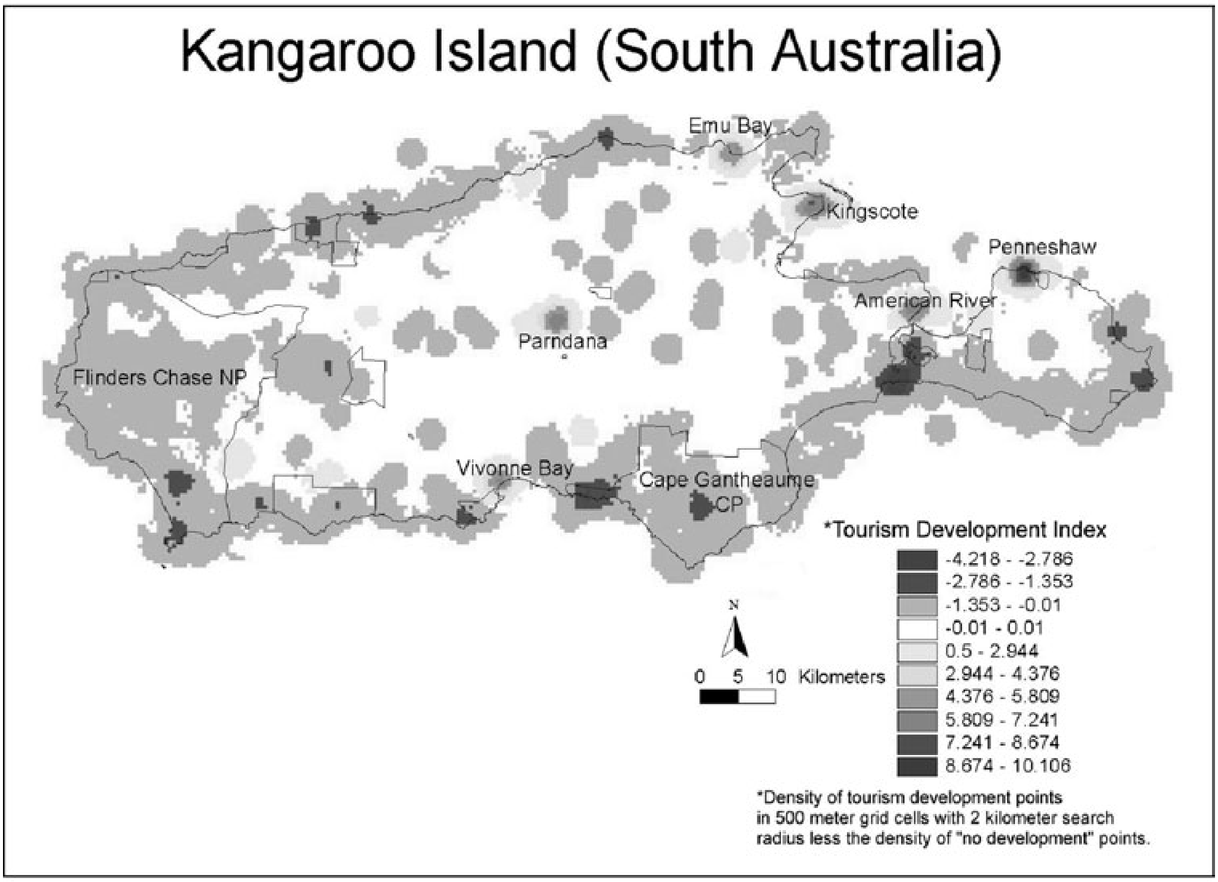

Figure 3. Simple tourism development model. Tourism development preferences appear on the map as a numeric index ranging from negative values (no tourism development preferences) to positive values (tourism development acceptable).

preferences being expressed for these areas. These areas are currently used primarily for agriculture.

The map observations and conclusions are supported by additional survey question results. In a 'tourism-friendly' question offered by the South Australia Tourism Commission, the question read, 'What do you think of developing more visitor accommodation in a limited number of coastal strategic locations provided they are attractively situated, small to medium scale, and achieve excellence in environmental design and management?' The response categories were 'good idea', 'bad idea' and 'no opinion'. Significantly, one-third of the residents indicated coastal tourism development was a 'bad idea' even with the favourable wording of the question. In another survey question, residents indicated the current level of coastal residential development was either too much (35%) or about right (51%) with only 11% indicating not enough. For KI residents, most coastal locations, with the exception of coastal areas located within existing townships, should be protected from additional development including both residential and tourism development.

Landscape values and development preferences by zoning classification

The relationship between perceived landscape values and zoning classifications is illustrated in Table 3, which shows the proportion of the 12 landscape values located within five zoning classifications from the Kangaroo Island

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Table 3. Percentage proportion (rank) of landscape values and development preference points located within selected KI planning zones

	KI Development Plan Zone				
Landscape value	Coastal	Conservation	Rural	Residential	Watershed protection
Aesthetic	21.8 (1)	9.1	7.4	15.9 (2)	2.6
Economic	5.5	5.9	16.5 (1)	40.1 (1)	4.5
Recreation	13.9 (2)	5.3	10.6 (3)	13.4	12.3 (2)
Life sustaining	2.2	9.3	7.4	0.4	33.1 (1)
Learning	4.8	10.2	11.4 (2)	3.4	5.0
Biological diversity	4.7	11.8 (2)	9.2	1.7	10.5 (3)
Spiritual	7.1	3.7	5.1	3.4	2.1
Intrinsic	8.1	5.8	6.8	3.4	6.0
Heritage	9.4	6.4	9.3	15.5 (3)	3.7
Future	6.2	11.4 (3)	6.2	0.4	7.1
Therapeutic	9.6 (3)	4.9	4.8	2.2	3.1
Wilderness	6.5	16.2 (1)	5.4	0	10.0
Development preferences:					
No development	42.4 (1)	73.5 (1)	22.1 (3)	5.2 (3)	44.3 (1)
Residential development	30.2 (2)	4.3 (3)	40.5 (1)	55.5 (1)	38.6 (2)
Tourism development	27.3 (3)	22.2 (2)	37.4 (2)	39.3 (2)	17.0 (3)

Council Development Plan (Planning SA, 2003). There is clear differentiation in perceived landscape values by zoning classification. For example, aesthetic/scenic value is the most common landscape value mapped in the 'Coastal' zone, wilderness value is most common in the 'Conservation' zone, life sustaining is most common in the 'Watershed Protection' zone, and economic value is most common in the 'Rural' and 'Residential' zones. Given that the survey respondents were blind to actual zoning classifications (KI zones did not appear on the map provided with the survey), and the relatively high percentage of residents (22.3%) that indicated they were not familiar enough to offer an opinion about the KI Development plan, these rational results suggest that the general public has the innate capacity to offer informed opinions about landscape values even if specific knowledge about the development plan is lacking. Despite the high degree of variability in mapped responses and the lack of precision in the point data because of map scale, residents do associate landscape values that are generally consistent with the current KI zoning classifications.

The quantitative relationships between development preferences and zoning classifications are shown in Table 3. The proportion of no development preferences is highest in the Conservation, Watershed Protection and Coastal zoning classifications whereas the proportion of residential development preferences is highest in the Residential and Rural zones. Tourism development preferences are also proportionately higher in the areas zoned Residential or Rural, primarily because of general resident preferences to locate future tourism development near existing town centres. Thus, resident development preferences (Figure 4) appear generally consistent with KI development plan zones that seek to limit development in Conservation, Coastal and Watershed Protection zones while encouraging development in Residential, and to a somewhat lesser extent, Rural zones.

DISCUSSION

If one is persuaded about the importance of community consultation in development planning, survey research can be an indispensable tool to measure representative community attitudes and preferences toward future tourism and residential development options. Traditional planning surveys, however, often lack

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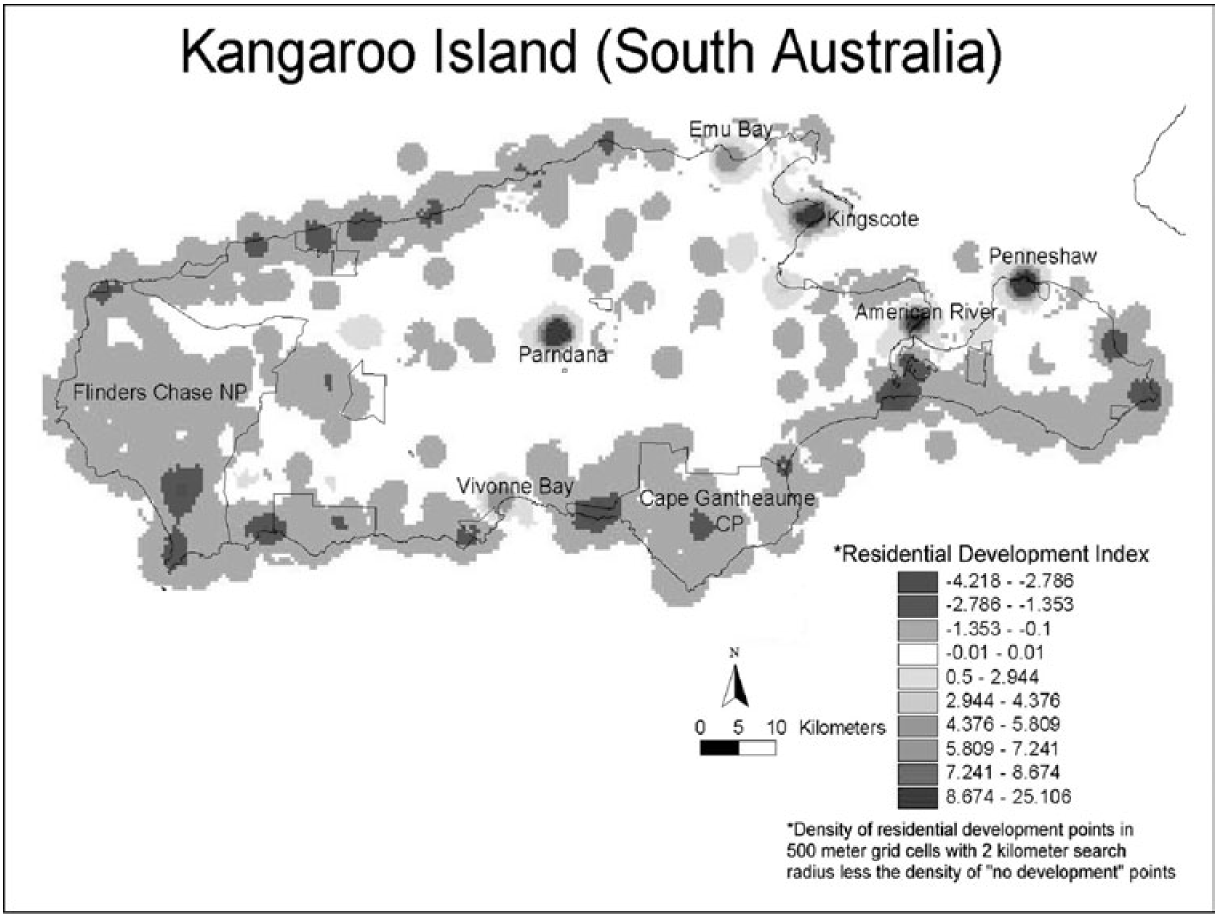

Figure 4. Simple residential development model. Residential development preferences appear on the map as a numeric index ranging from negative values (no residential development preferences) to positive values (residential development acceptable).

measures of place-specific preferences for development. To the extent that planning surveys do incorporate place-specific development preferences, the number of questions about place-specific areas is necessarily limited to keep the survey length reasonable. The method described herein obtains place-specific information about entire regions without placing an unreasonable response burden on survey participants.

The spatial survey method offers distinct advantages over traditional methods of community consultation. In addition to measuring the attitudes and preferences of the 'silent majority' through a scientific random sample of residents, the method offers respondents the opportunity to map their landscape values and development preferences. The place-specific information is important to inform the discourse about future development options. In short, place matters. Without the spatial mapping results, the general survey responses indicate that Kangaroo Island residents are supportive of slow growth (42%) or fast growth (15%) in tourism visitation, i.e. a majority of residents support some level of 'growth'. The local council would surely be inclined to approve most tourism development proposals given the favourable disposition of the resident population toward growth based on survey responses. And yet, favourable attitudes toward tourism growth do not translate into place-specific public assent to development. The simple tourism development model

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and map presented herein indicate that virtually any coastal development proposal outside of the major island townships, or located within existing conservation parks, will probably meet considerable resident opposition.

The opposition to tourism development comes from residents wanting to protect place-specific values for particular areas of the island with the oppositional discourse including arguments about the need to protect wilderness, intrinsic, therapeutic, scenic, biological, learning, future or life-sustaining values — the landscape values that are spatially coincident with preferences for no development. Residents may not articulate their oppositional perspectives with this specific type of 'values' language, but the place-based values will be implicit in their argument. Similarly, tourism development proponents will argue the ability of the proposed development to generate economic value because of the development being physically located to take advantage of proximate recreation, scenic and heritage value attractions.

Tourism development decisions, however, are seldom driven by rational discourse about the presence of compatible landscape values. Development activity is inherently entrepreneurial with government often acting as a reactive arbitrator of community values rather than a proactive agent for social planning outcomes. Although local government often sets the 'tone' and establishes the 'rules' for economic activity, it cannot force private investment nor arbitrarily dismiss unattractive land-use applications. Land-use zoning designations are a useful guide but zoning change proposals frequently accompany tourism development proposals. Those opposed to future development are often cast with the NIMBY ('not in my backyard') label and are positioned as selfishly protecting their personal interests, whereas the developer seeks the higher moral ground and positions the development in the public interest based on economic returns to the community. A landscape value analysis that is grounded in place reveals that such characterisations are much too shallow and that landscape value trade-offs are not hypothetical, but real.

Traditional land-use planning partitions a landscape into different zoning classifications under the assumption that the potential for conflict is reduced by spatially separating incompatible land uses (e.g. industrial and residential land use) and clustering complementary land uses (e.g. residential and recreation land use). The creation and allocation of land-use zoning classifications is often viewed as a technical planning activity best reserved for those with formal training in land-use planning. The process of zoning can formalise or legitimise existing publicly perceived landscape values but equally important, the process may actually establish new landscape value expectations. Either way, one would expect some degree of correspondence between public landscape value perceptions and existing zoning classifications. In this study, the KI Development Plan zones appear to generally capture the perceptions and preferences of the KI resident population.

The consistency of resident landscape values and development preferences with existing KI development plan zoning classifications enhances the concurrent validity of the spatial mapping method for tourism and residential development planning and suggests the method could be applied in other regions grappling with tourism and/or residential growth. The method could be enhanced further by partitioning respondents at the community level to determine smaller scale development preferences and by including the sampling of visitors to the study region to contrast with resident expectations.

There are several important benefits with the spatial mapping method if used as part of a public consultation process. The spatial mapping method can supplement the technical land-use planning process, complete with its hidden values, with a rationally defensible public values perspective that is grounded in explicit, place-specific values. The collection of landscape values and development preferences provides an opportunity for iterative adjustment between expert and lay planning perspectives in the process. If a land use or development plan is already in place, the method provides an opportunity to assess prospective development proposals for consistency with zoning classifications or other development criteria contained in the plan. Perhaps most important, the spatial mapping method provides legitimacy to land-use deci-

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sions that are grounded in true public consultation because it accesses the 'silent majority' rather than the often narrow set of development interests that may or may not approximate the public interest.

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