

## **The Meanings Associated with Varying Degrees of Attachment to a Natural Landscape**

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### **Abstract**

There has been little research concerning the association between “place meanings” and “place attachment.” An understanding of the association between these constructs is important because they do not stand alone, but rather, complement one another. We documented the meanings ascribed to a national forest in California by five groups of respondents that varied in their mode and attachment intensity to the setting. For example, respondents with high-attachment intensity ascribed meanings related to memories of shared experiences and sense of comfort; whereas the low-attachment respondents were distinguished by the brevity of their narratives. The findings provide a more nuanced understanding of how individuals’ level of place attachment is manifested in the way in which they understand and experience the setting.

*KEYWORDS: Place meaning, place attachment, mixed-methods*

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Research concerning the value of natural landscapes has evolved to incorporate visitors' subjective, emotional, and symbolic meanings associated with particular settings in addition to economic impact models (Williams & Vaske, 2003). These subjective valuations can be difficult to identify because they are often expressed in dynamic ways (Stokowski, 2002). One way that researchers have attempted to understand the subjective components of landscape value is by investigating human-place bonds using the concepts of place meaning and place attachment (Kyle, Graefe, & Manning, 2005; Proshansky, 1978; Williams, Patterson, Roggenbuck, & Watson, 1992).

Place meanings reflect the value of the setting, whereas place attachment concerns the intensity of the human-place bond across dimensions related to identity, functional utility, emotional connection, and social interaction. Kyle and Chick (2007), wrote that past research on place "in the leisure literature has been primarily concerned with the intensity of recreationists' attachment and less so with the reasons for attachment. ... It does not represent an understanding of human-place bonding reflected in the broader literature" (p. 209). As a result, the leisure literature and the greater place literature have provided only limited insight on the association between place attachment and place meaning (Trentelman, 2009).

Although past research has led to valid and reliable scales that measure the intensity of people's attachment or has been able to describe in rich detail the meanings places hold for people, there has been little work that describes meanings at varying levels of attachment intensity. This disconnect is partially due to the two modes of knowing that have predominantly been used to examine the constructs. As Trentelman (2009) indicated in her review of the place literature, scales used in positivistic designs have been criticized for abstracting an individual's thoughts and feelings toward a place into dimensions that provide little insight on the subjective meanings we associate with places. On the other hand, interpretive designs provide tremendous insight on the character of meanings, but have received criticism for reflecting the meanings of only a select few people and places. This investigation utilizes both approaches in an attempt to provide insight on how place attachments that are quantified using psychometric scales are manifested in individuals' accounts of why natural landscapes hold value and significance.

## **Literature Review**

To investigate the association between place meanings and place attachment, we began by reviewing the empirical research that has sought to develop and refine the measurement of the intensity of an individual's attachment to a setting. We also reviewed literature concerning the conceptualization of place meaning and typologies of meanings identified in natural settings. Finally, we discuss the literature that connects these concepts.

### **Place Attachment**

Research developing place attachment scales has been prominent in literature concerning the relationship between humans and the natural environment for the past 15 years. The purpose of these scales has been to identify the extent to which

people are attached to landscapes rather than to identify the factors that foster attachment (Stedman, 2002). In this regard, Williams, Patterson, Roggenbuck, and Watson (1992) suggested a two-dimensional scale composed of place identity and place dependence. Place identity refers to the cognitive connection people share with the setting which is a substructure of the global concept of self-identification (Proshansky, 1978; Jorgensen & Stedman, 2001). Cuba and Hummon (1993) suggested that there are places to which individuals are familiar, but the settings that are the basis of identity are ones in which the individual works, lives, and plays. Individuals can use places to confirm their identity to themselves and express their identity to others (Twigger-Ross & Uzzell, 1996). Based on identity process theory, Twigger-Ross and Uzeell suggested that place identity is developed through four processes: the distinctiveness of place as opposed to other settings; the continuity of a place with other places important to the individual; the self-esteem that can be gleaned from an association with a place; and the self-efficacious growth attained by achieving success in carrying out a chosen activity in the place. Although the strength of individuals' bonds with a place vary due to processes of identification, Pretty, Chipuer, and Bramston (2003) observed that individuals use "I" and "me" statements when describing settings that have become integrated into their self-identity. Lastly, it has been suggested that people do not identify directly with the place but rather with the meanings they ascribed to that place (Kyle, Mowen, & Tarrant, 2004).

Place dependence is a conative component of place attachment (Jorgensen & Stedman, 2001). Stokols and Shumaker (1981) defined place dependence as an individual's "perceived strength of association between him or herself and a specific place" (p. 547). The bond captured by place dependence scales is reflects the individual's assessment of the functional utility of a setting in providing for goal achievement given a range of alternatives (Jorgensen & Stedman).

In addition to place identity and place dependence, we included measures of an affective dimension and a social dimension proposed by Kyle, Mowen and Tarrant (2004). Affective attachment was defined by Kyle et al. as the emotional bond to a place that is formed by interaction with the setting and others. Additionally, several environmental psychologists have noted that individuals express social ties to a setting (Mesch & Manor, 1998; Hidalgo & Hernández, 2001). For example, Mesch and Manor observed that the more close friends and neighbors their respondents had nearby, the higher their level of attachment was. Further, Hidalgo and Hernández observed that across the three spatial dimensions (i.e., house, neighborhood, and city), social bonds with others were associated with attachment to the setting. Drawing from this earlier work, Kyle et al. (2004) defined social bonding as a component of place attachment resulting from the social ties to a place.

### **Place Meanings**

Multi-dimensional place attachment scales go beyond providing a single numeric indicator of the intensity of an individual's attachment to place by painting an abstract picture of their thoughts, feeling, and behaviors related to the setting in question. However, these scales fail to capture details on why places of signifi-

cance are meaningful. To understand the subtle, yet important, aspects of people's thoughts and feelings related to place, researchers have sought to understand the meanings people ascribe to specific settings. Place meanings are the symbolic and evaluative sentiments ascribed to a setting that reflect the value and significance of the setting to the individual (Stedman, 2002). Many researchers agree that place meanings and attachment are socially constructed through shared or similar experiences in a particular setting (Eisenhauer, Krannich, & Blahna, 2000; Greider & Garkovich, 1994; Kyle & Chick, 2007). Hence, meanings ascribed to places are influenced by interactions between the individual, the setting, and the individual's social worlds (Milligan, 1998). An important implication, highlighted by the social construction perspective, is the influence of culture on an individual's place meanings (Yung, Freimund, & Belsky, 2003). Kyle and Johnson (2008) suggested that the thoughts and feelings "bestowed upon specific settings are socially constructed symbols that reflect cultural perspectives" (p. 128). For example, in her investigation of cultural variations in attachment to natural settings, Johnson (1998) observed that socio-historical factors contributed to a lack of interest in and appreciation for wildland places by African Americans as opposed to White Americans. In light of these findings, it is appropriate to interpret place meanings within the cultural context of the people who are ascribing the meaning.

The nature of the meanings individuals ascribe to a setting have been associated with the stimuli (e.g., physical attributes that characterize the place and other people visiting the place) with which they interact. For example, Manzo (2005) observed that meanings ascribed to natural settings generally include privacy, introspection, and self-reflection. Other meanings that have been identified, as ascribed to natural resource settings include: ease of access; natural-roadless; unique contrast to everyday settings; familiar, historically important, or traditional meanings; scenically attractive; physical features of the landscape; and work-oriented meanings (Gunderson & Watson, 2007). Gunderson and Watson also noted that the meanings reported for less frequently visited places differed slightly from more frequently visited places. In the Bitterroot National Forest less-visited places were also ascribed meanings of: social identity; wilderness ideals; intrinsic values; exploration of new places; cultural significance; and beauty or scenery. In a recreation specific context, Bricker and Kerstetter (2002) reported that river rafters in northern California indicated that the river's beauty, their shared experiences with friends, and the joy of running the river were important meanings they associated with the South Fork of the American River.

### **The Place Attachment and Place Meaning Association**

The existence of a relationship between place attachment and place meaning is rooted in research that has identified similar formation processes for each of the constructs. This research suggested that place meanings and place attachment form through repeated interaction with a setting, social interaction within a setting, and need satisfaction. For example, Hay (1998) and Milligan (1998) described how place meanings were developed and maintained over time through ancestral connections and/or repeated individual interaction with the environment. Similarly, empirical studies have suggested that past experience and memories of those

experiences contribute to place attachment formation (Rowles, 1983; Vorkinn & Riese, 2001). Beyond individual interaction with the environment, other studies have indicated the importance of social interaction in fostering a sense of place attachment and creating place-specific meanings expressed as memories (Kyle & Chick, 2007; Mesch & Manor, 1998). Additionally, several researchers have observed other phenomena that are important for the development of meaning and attachment. Hay (1998) noted the importance of spiritual connections to place. Ulrich (1991) and Kaplan and Kaplan (1989) have hypothesized that people choose to live, recreate, and work in certain places because those places satisfy specific needs. They found that people prefer places that provide for self-reflection and restoration from stress and mental fatigue. Lastly, Tuan (1977), Hay (1998), and Kyle and Chick (2007) all indicated that the formation of meanings and attachment can be actively created by the individual or can occur without their conscious awareness.

Although the research has indicated that place meanings and place attachment form through similar phenomena, there has been little work investigating how place attachment scales reflect the meanings individuals ascribe to a setting (Stedman, 2006). Stedman's (2003) work is one of the few pieces of research that has attempted to connect meaning and the intensity of people's attachment to places. He found that place meanings mediated the relationship between the characteristics of the setting and the respondents' intensity of place attachment and satisfaction with the setting. Specifically, Stedman observed that meanings associated with a sense of escape were positively related to respondents' attachment and satisfaction, but social meanings had a mixed relationship with the constructs. Furthermore, in another paper, Stedman (2002) wrote, "we attribute meaning to landscapes and in turn become attached to the meanings" (p. 563). Although Stedman's research provided some insight into the association between place meaning and place attachment, the exact nature of the meanings ascribed to different settings, and held by individuals with differing levels of intensity of attachment, remains poorly understood. A greater knowledge of the duality of place (i.e., meaning and attachment intensity) may help develop a deeper understanding of the value of a particular resource to various users.

With this in mind, the purpose of this investigation was to explore the association between the intensity of respondents' place attachment to a natural resource recreation setting and the place meanings they ascribed to that setting. The goal of this study was to go beyond the conclusions derived from Stedman's (2003) research that suggested that the characteristics of the physical environment form the basis of meanings, which affect attachment. Given that the literature suggests that other concepts (e.g., individual characteristics and social interaction with regard to the setting) also influence meaning, the research objective of this investigation was to identify and describe the particular types of meanings that were associated with differing intensity profiles that reflected the respondents' level of place attachment to the resource. This is a first step in understanding how certain meanings are reflected in varying levels of attachment. Conversely, the knowledge that certain meanings are associated with greater or lesser attachment may inform the interpretation of place meanings and the phenomenon of the human-place bond.

## Methods

### Data Collection

Data for this investigation were taken from a larger study of the public's perceptions of wildfire management within the wildland-urban interface near Cleveland National Forest (CNF) in southern California. While we have no substantive reason to believe that the subject of the survey had an effect on the place-related items used and associations explored in this analysis, we acknowledge the possibility of an unknown effect. The CNF lies within 50 miles of downtown San Diego and the suburban area extends to the Forest's borders. Questionnaires were mailed in the fall of 2006 to residents living within one half-mile of the forest perimeter. This buffer was chosen to select residents facing the greatest threat from wildfire, a core element of the broader investigation. The buffer was identified using ArcGIS software. Census blocks intersecting with this buffer were selected and names and addresses of residents within these blocks were provided by a commercial research company. Addresses falling within this buffer were retained ( $N = 2,162$ ). This procedure produced a sample of respondents whose homes were within or near the CNF and who visited the CNF for a variety of reasons, including employment and recreation. A modified Dillman (2000) procedure was used with four contacts via postal mail. A total of 724 respondents returned a survey instrument. This sampling procedure yielded a 33% response rate. Because our measure of the respondents' intensity of place attachment had "Cleveland National Forest" as the place reference, only residents who had visited the CNF and identified a "favorite" place within the forest were included in this analysis ( $n = 275$ ).

### Measures

Given that the purpose of this analysis was to explore the association between people's evaluative assessment of place and their descriptions of why the setting was special or their favorite, two forms of data were collected. First, using an open-ended format, respondents were asked to indicate a "favorite or special place" within the CNF and describe why it was their favorite. Based on previous research, the terms 'favorite' and 'special' were used to prompt the respondents to describe the meanings they ascribed to a setting because these terms provide the respondents freedom to indicate their emotional attachments to places (Bricker & Kerstetter, 2002; Eisenhauer, Krannich, & Blahna, 2000; Schroeder, 1996). These terms acknowledge that the conceptual elements of place form an emic perspective that denotes something of particular value to the respondents. Hence, having respondents describe a favorite place allowed for a range of interpretation of places people have imbued with meaning (Schroeder).

Respondents were then presented with Kyle et al.'s (2004) 14-item place attachment scale hypothesized to measure four dimensions of place attachment: place dependence, place identity, affective attachment, and social bonding. Respondents were asked to indicate their level of agreement with each item along a five point Likert-type scale where 1 = Strongly Disagree, 3 = Neither Agree nor Disagree, and 5 = Strongly Agree. It is important to note that emotional relation-

ships to places can be either positive or negative (see Manzo, 2005), however this investigation is focused on respondents' positive affective attachment.

### Data Analysis

Due to the nature of the constructs being investigated, we chose a concurrent mixed-method design to answer a single research question using both qualitative and quantitative data (Tashakkori & Teddlie, 2003). The two types of data can be collected at the same time (e.g., a cross-sectional survey) and the final inferences are informed by both data analysis results. According to Tashakkori and Teddlie, this research design is advantageous in that it allows the researcher to gain perspectives from two different types of data and allows for an understanding of data that are hard to quantify (e.g., place meanings). A limitation of the method is that it still has the drawbacks of a one-time, cross-sectional survey and does not allow for probing of open-ended responses.

The first step in the analysis was to produce descriptive statistics for indicators of the sample characteristics (i.e., sociodemographic) and the place attachment scale items. Then, confirmatory factor analysis (CFA) using LISREL was conducted to assess the four-dimensional place attachment measurement model. Since the chi-square Likelihood Ratio test is sensitive to sample size, the assessment of the model was provided through several other goodness-of-fit indices: root mean square error of approximation (RMSEA), comparative fit index (CFI), normed fit index (NFI), and non-normed fit index (NNFI) (Byrne, 1998). For the RMSEA, values  $\leq .08$  indicate acceptable fit (Steiger & Lind, 1980). For the CFI (Hu & Bentler, 1995) and NFI (MacCallum, Browne, & Sugawara, 1996) values  $\geq .95$  indicate acceptable fit. Bentler and Bonnett (1980) designated values  $\geq .95$  as acceptable for the NNFI. Also, Cronbach's alpha was calculated for each of the factors as an indicator of the scale's internal consistency.

After conducting the CFA, four composite variables were created reflecting each of the place dimensions. These variables were based on the grand mean for each dimension consisting of the items that loaded onto each dimension (i.e., place identity, place dependence, affective attachment, and social bonding). The four composite variables were used to group the respondents by their intensity of attachment. Because the conceptualization of place attachment used in this investigation was based on research that indicated the multi-dimensional nature of the construct, we needed to use a method of grouping that accounted for each of the place attachment dimensions simultaneously. To accomplish this, cluster analysis (K-means procedure) was used. Cluster analysis allowed for the identification of homogenous segments (Milligan & Cooper, 1987) of respondents based on their scores on the four place attachment dimensions. The advantage of this method is that the categories were based on the respondents' responses rather than being assigned *a priori* by the researchers. An ANOVA was used to determine whether there were differences between the clusters on their place dimension scores.

Qualitative analyses began with sorting respondents' statements into the groups identified in the cluster analysis. These statements described why the places they identified were their favorite. Using open coding (Strauss & Corbin, 1998), we reduced each respondent's statement into discrete parts that represented differ-



ent ideas. As a framework to decide how to break the statements into independent ideas, we chose nouns and verbs that represented types of meanings (i.e., physical attributes of the environment, proximity to home, family and friends, and opportunity for self-reflection) that have been identified in previous research as described in the literature review of this paper. This framework did not exclude new meanings from being identified, but rather served as a tool to guide the analytical process of identifying all of the themes (Merriam, 1998). Following the open coding of respondents' statements, the first author and a colleague independently evaluated the list of ideas using constant comparison to determine similarities and differences (Merriam). The ideas identified were grouped together to form categories. We provided each category with a title consistent with the theme of ideas reflected in the category. For example, camping, hiking, and viewing scenery were each labeled "recreation" and placed in the category entitled "recreational activity." The first author and the colleague also independently identified sub-categories stemming from the overarching categories. For example, a category we titled 'physical attributes' also contained the sub-themes of 'natural elements' and 'built elements.' This coding process was repeated for each cluster independently. The inter-rater reliability between the two researchers for the themes and subthemes identified from these data was greater than 75% for each of the place attachment clusters, indicating an acceptable level of reliability (Miles & Huberman, 1994). Also, as Merriam recommends, to ensure the validity of the themes identified, we sought feedback on the themes identified from colleagues knowledgeable about place meaning. We then compared and contrasted each of the themes and sub-categories that emerged from each cluster to those themes and sub-categories from the other clusters.

## Results

### Respondent Characteristics

The age range of the respondents was 25 to 91 years ( $M = 60$ ;  $SD = 13.3$ ). Just over half were male (56%) and almost all reported their race as White (96%). They were well educated with the majority of respondents (72%) having completed an undergraduate or higher degree; most of the remaining respondents indicated that their highest level of education completed was high school (26%). Respondents' incomes were well dispersed with about half (47%) earning less than \$60,000 a year and the next third earning between \$60,000 and \$119,999.

Given the dominance of middle class Whites in the sample (which was representative of the population in the study area), it was necessary to interpret the results of this investigation in the context of the white European experience. Although this analysis is not designed to be generalized to a larger population, it will be important for future studies to purposely seek out a culturally diverse sample.

### Intensity of Attachment

After removing one place dependence item from Kyle et al.'s (2004) place attachment scale due to cross loading, the CFA illustrated that the four-dimensional model of place attachment was a good fit with these data (Table 1). The fit indices



were all within acceptable ranges: RMSEA = .07, NFI = .98, NNFI = .98, and CFI = .99. The internal consistency for each place attachment dimension was also acceptable ( $\alpha = .70-.92$ ).

The items' descriptives presented in Table 1 indicated that the intensity of the respondents' attachment, as an entire group, to the CNF was relatively weak. The means for each of the place attachment dimensions hovered around neither agree or disagree on the five-point scale. Respondents scored highest on the affective attachment dimension ( $M = 3.31$ ;  $SD = .74$ ), followed by social bonding ( $M = 3.22$ ;  $SD = .85$ ), place identity ( $M = 3.04$ ;  $SD = .81$ ), and then place dependence ( $M = 2.98$ ;  $SD = .69$ ).

Table 1

*Place Attachment Scale Item Means, Factor Loadings, and Reliabilities*

<b>Factored dimension (Item)</b>	<b>Item mean</b>	<b>Factor loading</b>	<b>Standard error</b>	<b>Factor mean</b>	<b>Cronbach's alpha</b>
<b>Place dependence</b>				2.98	.70
The Cleveland NF is the best place for the recreation activities that I enjoy	3.18	.54	.03		
Compared to the Cleveland NF, there are few satisfactory alternatives	2.90	.45	.03		
I can't imagine a better place for what I like to do	2.87	.76	.03		
<b>Place identity</b>				3.04	.92
I feel the Cleveland NF is a part of me	3.03	.84	.03		
I identify with the Cleveland NF	3.12	.81	.03		
I feel that my identity is reflected in the Cleveland NF	2.92	.75	.03		
Visiting the Cleveland NF says a lot about who I am	3.06	.70	.03		
<b>Affective attachment</b>				3.31	.80
I have a strong emotional bond to the Cleveland NF	3.31	.73	.03		
I really enjoy the Cleveland NF	3.74	.53	.03		
I'm happiest when I get to visit the Cleveland NF	2.97	.64	.03		
<b>Social Bonding</b>				3.22	.88
The time spent on the Cleveland NF allows me to bond with my family and friends	3.24	.69	.03		
I associate special people in my life with the Cleveland NF	3.08	.87	.03		
Visiting the Cleveland NF allows me to spend time with my family and friends	3.35	.71	.03		

Means based on a 5-point scale: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree  
 Model:  $\chi^2=256.94$ ,  $df=56$ ; RMSEA=.07, NFI=.98, NNFI=.98, CFI=.99

Although the mean level of attachment was weak, further analysis revealed that within the sample there were several groups of respondents with differing levels of attachment intensity. Using the factor solution emerging from the CFA, we conducted cluster analysis in SPSS (K-means procedure) to classify respondents into homogenous groups based on their mean scores on the place attachment dimensions (Milligan & Cooper, 1987). Our analysis revealed five distinct clusters (Table 2). The first cluster ( $n = 35$ ), labeled attached, consisted of respondents who scored high on all four place attachment dimensions (place dependence,  $M = 4.41$ ,  $SD = .47$ ; place identity,  $M = 4.66$ ,  $SD = .40$ ; affective attachment,  $M = 4.70$ ,  $SD = .31$ ; social bonding,  $M = 4.54$ ,  $SD = .57$ ). The socially bonded cluster ( $n = 75$ ) scored high on social bonding ( $M = 4.20$ ;  $SD = .41$ ), but lower on the other three dimensions (place dependence,  $M = 3.21$ ,  $SD = .52$ ; place identity,  $M = 3.70$ ,  $SD = .36$ ; affective attachment,  $M = 3.99$ ,  $SD = .35$ ). The third cluster ( $n = 47$ ) scored markedly lower on social bonding ( $M = 3.06$ ;  $SD = .41$ ) compared to the other three dimensions (place dependence,  $M = 3.52$ ,  $SD = .47$ ; place identity,  $M = 3.61$ ,  $SD = .40$ ; affective attachment,  $M = 3.86$ ,  $SD = .38$ ) and was labeled low social bonding. The fourth cluster, mixed attachment, ( $n = 97$ ) scored lowest on the place dependence ( $M = 2.83$ ;  $SD = .39$ ) and place identity ( $M = 2.96$ ;  $SD = .33$ ) dimensions, but had moderately high scores on the affective attachment ( $M = 3.31$ ;  $SD = .30$ ) and social bonding ( $M = 3.34$ ;  $SD = .44$ ) dimensions. The last cluster, named low attachment ( $n = 21$ ), consisted of respondents who scored lower on all four attachment dimensions (place dependence,  $M = 2.51$ ,  $SD = .55$ ; place identity,  $M = 2.97$ ,  $SD = .29$ ; affective attachment,  $M = 2.66$ ,  $SD = .50$ ; social bonding,  $M = 2.59$ ,  $SD = .47$ ).

Table 2

*Results of Cluster Analysis and Comparison of Place Attachment Means by Cluster (n=275)*

Dimension	Cluster place attachment dimension means (SD)					ANOVA	
	Attached (n=35)	Socially bonded (n=75)	Low social bonding (n=47)	Mixed attachment (n=97)	Low attachment (n=21)	$F_{df=4,274}$	$p$
Place dependence	4.41 <sup>a</sup> (0.47)	3.21 <sup>b</sup> (0.52)	3.52 <sup>c</sup> (0.47)	2.83 <sup>d</sup> (0.39)	2.51 <sup>e</sup> (0.55)	91.81	0.01
Place identity	4.66 <sup>a</sup> (0.40)	3.70 <sup>b</sup> (0.36)	3.61 <sup>b</sup> (0.40)	2.96 <sup>c</sup> (0.33)	2.07 <sup>d</sup> (0.29)	234.94	0.01
Affective attachment	4.70 <sup>a</sup> (0.31)	3.99 <sup>b</sup> (0.35)	3.86 <sup>b</sup> (0.38)	3.31 <sup>c</sup> (0.30)	2.66 <sup>d</sup> (0.50)	165.89	0.01
Social bonding	4.54 <sup>a</sup> (0.57)	4.20 <sup>b</sup> (0.42)	3.06 <sup>c</sup> (0.41)	3.34 <sup>d</sup> (0.44)	2.59 <sup>e</sup> (0.47)	123.70	0.01

Means based on a 5-point scale: 1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree

Means with different superscripts indicate a statistical difference between clusters at  $p < .01$

The ANOVA confirmed that the results of the cluster analysis produced groups with unique sets of the profiles regarding the intensity of the respondents' attachment to the national forest. In general, the means of the place attachment dimensions differed between clusters. For place dependence and social bonding, all of the clusters varied from one another ( $F_{df=4,274} = 91.81; p < .01$ ;  $F_{df=4,274} = 123.70; p < .01$ ). For place identity, only the socially bonded and low social bonding clusters were not different from each other ( $F_{df=4,274} = 234.94; p < .01$ ). Similarly, for affective attachment, only the means for the socially bonded and low social bonding clusters were not different from each other ( $F_{df=4,274} = 165.89; p < .01$ ).

### Place Meaning Descriptions

Next, we analyzed the respondents' open-ended responses regarding why the place they indicated was their favorite, in order to identify the themes contained within each cluster. Each cluster was evaluated independently to determine the themes without the influence of the themes that were identified in each of the other clusters. Although we identified the themes within each cluster independently, upon comparison we observed a large amount of commonality among the clusters with regard to the emergent themes. The major themes we identified in most of the clusters were: 'physical attributes,' 'recreational opportunity,' 'proximity to home,' and 'social interaction.' The descriptions below illustrate that for many, the themes blended into one another. It was also evident that the respondents' narratives reflected a white middle-class European American view of nature. As illustrated in the following quotes, place attributes, leisure experiences, and social interaction are all indivisible elements of their place experience; "one of the most beautiful wild places in the county. The forest, waterfalls and pools [are] excellent for backpacking, camping and day hikes..." And from another respondent, "the beautiful trails, camaraderie with the outdoor camping experience in a wildlife preserve." Thus, in our effort to identify broad themes that provide insight as to why settings were special, we run the risk of abstracting respondents' experiences from the reality of their lived experiences. We have attempted to soften the decontextualizing effect of our coding by providing additional description of informants' responses. This allowed us to identify sub-themes of meanings that differ between the place attachment intensity groups. Our observations for each cluster follow and the distinctions in sub-themes between the clusters are summarized in Table 3.

**Attached cluster (n=35).** The statements provided by respondents who were members of the attached cluster contained all four themes: 'physical attributes,' 'recreational activity,' 'social interaction,' and 'proximity to home.' More than half of the respondents in this cluster mentioned that the physical attributes of the setting were their favorite things about the place. These responses included statements such as, "Wild, open spaces, mountains, lake, a little wildlife, fresh and free. Nature as it should be..." Similarly, another respondent indicated that their special place in the CNF was their favorite because of the "lake, mountains, forest, [and] animals." Beyond the natural characteristics of their favorite places, some respondents also commented on the built environment that surrounded their favorite place. For example, one respondent wrote that her favorite place had

Table 3

*Unique Sub-themes Among Clusters Based on Attachment Intensity Profiles*

Theme	Cluster				
	Attached (n=35)	Socially bonded (n=75)	Low social bonding (n=47)	Mixed attachment (n=97)	Low attachment (n=21)
Physical attributes	Comfort	Naturalistic; Human -impacts	Aesthetic beauty *	∅	<i>Less rich &amp; descriptive across all themes</i>
Recreational opportunity	∅	Distinct opportunities	∅	Education; Socialization	
Proximity to home	<i>No differentiation between clusters on this theme</i>				
Social interaction	Memories of shared experiences	Participation in non-recreation activities	<i>This theme did not exist for this cluster</i>	Interaction with unknown people	

∅ There were no unique sub-themes identified in this cluster for this theme

\* Regarding the low social bonding cluster, the theme 'physical attributes' was the predominant meaning theme mentioned by members of this cluster, with most focusing on the aesthetic beauty of the physical attributes.

a “friendly open atmosphere with little crowd/traffic; spectacular scenery close by; snow in winter. Hiking, fishing, and horse trails/camp-overnight facilities-great day trip by car. Services in Julian, etc., etc. (it’s home!).” This response exudes the idea of rootedness to a place (Tuan, 1980). That is, she perceives the aspects of the built environment (e.g., services, facilities, and the lack of crowding and traffic) surrounding her favorite place as providing her with a sense of security and comfort. She indicated that this sense of security and comfort make her feel like she is at home.

The respondents’ narratives in the attached cluster differed from other clusters in that the respondents not only identified their favorite physical attributes, but also discussed how the attributes made them feel comfortable and relaxed; “[It is] most scenic, most natural, isolated and quiet. I feel in touch with nature and [this] inspires me to contemplate and relax and be thankful.” This respondent seemed to echo the sentiments from the writings of Emerson (1836) and Thoreau (1854); they felt that immersing themselves in the natural setting had a restorative effect. More recently Kaplan, Kaplan, and Ryan (1998) indicated that the quiet fascination people have with natural settings permits self-reflection and provides a restorative.

Respondents also indicated the importance of recreation opportunities tied to place. For instance, in the following two quotes the respondents highlighted the range of opportunities they could enjoy, “[It’s] beautiful, [I] love to ride, hike, camp there...” Similarly, “We live in this area, hike its trails, jeep off road occasionally, [and] enjoy the natural setting and animals.” In both statements, the functional value of the resource and its natural elements contributes to their appreciation of the setting. In these statements, activity and place intermingle such that place attributes facilitate valued leisure experiences.

Many of our respondents indicated that their identified special place was their favorite because they lived nearby. In the following quotes it is apparent that proximity alone does little to shape meanings. Rather, place proximity allows for the development of meaning through extensive and prolonged interaction; often through recreation activities, alone or with others. For example, one person simply wrote, “It’s where I live.” Other respondents indicated, “Close to home-beautiful, a good hike,” and “Very convenient to house, no leash needed for dogs, very uncrowded, spacious, fun to admire the terrain.” Our observation mirrors others’ work that has shown the influence of proximity in the development of meaning and attachment, especially proximity to home (Mesch & Manor, 1998; Moore & Graefe, 1994).

The relationships that people share with family and friends were also reflected in many respondents’ statements of why their favorite places were special. For example, “Because we get together with friends and family and share wonderful memories for as long as I can remember,” and “Twice a year I meet friends for a pot luck picnic; rangers are always kind.” In these statements, the importance respondents ascribed to their relationships has become embedded in the spatial contexts where these relationships are experienced and celebrated. As such, place has become a receptacle for and reminder of memories of shared experience.

The language used by members of the attached cluster, which highlighted the importance of memories, was unique to this cluster. This is not to say that narratives included in other clusters did not reference past social interaction, rather, in the attached cluster, the respondents specifically described how their special place was a receptacle for memories. We also observed that repeated gatherings or reunions further ingrained meaning and sentiment ascribed to the site.

**Socially bonded cluster (n=75).** Among those respondents grouped as having higher social bonding and moderate intensity levels in the other attachment dimensions, many of them indicated that the physical attributes of the setting were important to them. These respondents also listed a more diverse range of specific characteristics that represent this theme (e.g., beauty, weather, water, wildlife, flora, mountains, ecosystem, and serenity) than respondents in other clusters. Furthermore, the responses in this cluster are the only ones that alluded to the impact of humans on the environment (e.g., air quality and trash). An example from one respondent was that her place in the CNF was her favorite because of the “trees, mountains, plants, animals, climate, air quality.” Another respondent not only mentioned her positive perceptions of her favorite place, but a negative perception as well: “trees, plants, water, animals and sadly picking up trash-recycling!” Both of the responses ascribed naturalistic meanings (i.e., satis-

faction obtained through direct experience with nature and wildlife) to favorite places as indicated by the respondents' implication that nature has a right to exist, unmodified by humans, for its own sake (Kellert, 1996). Associating naturalistic meanings with the setting's physical attributes was exclusive to the narratives included in the socially bonded cluster.

As in the other clusters, these respondents cited participation, with or without others, in a wide range of recreation opportunities as contributing to their appreciation for their special place. They indicated that they enjoyed the "beautiful camping [and] picnicking" available and that the CNF "was a place where I would ride my horse. The mountain gave me a sense of peace." As before, we noted that the functional value of the resource and its natural elements contributed to the respondents' appreciation of the setting. Exclusive to this cluster were respondent statements that indicated the ability of a place to provide distinct opportunities. One person wrote: "It provided a unique camping experience for people on horseback. It was available to individuals on a first come, first served basis." Uniqueness of places and recreational experiences provide important distinctions to individuals when they consider how these concepts express or create their self-conception. Twigger-Ross and Uzzell (1996) suggested that unique attributes of places allow people to form place identifications which serve to distinguish people from one another.

The respondents in the socially bonded cluster also indicated that their home's proximity to their favorite place was important, as well as their social interaction with family and friends. Although these respondents' statements did not differ in level of detail regarding these two themes, the statements regarding social interaction did provide further insight into the human-place bond. Specifically, the importance of non-recreational activities (e.g., grazing and logging) was a sub-theme in this cluster that differentiated it from other clusters. For example, one individual noted that recreation is not the only activity that allows people to identify a place as special: "Childhood memories and current gathering cattle, riding on it, enjoying the open space, privately owned-freedom to enjoy unrestricted use."

**Low social bonding cluster ( $n=47$ ).** As opposed to the other clusters, members of the low social bonding cluster did not report any meanings which fit the 'social interaction' theme. This group of respondents was also distinguished from clusters with different levels of attachment intensity by the prominence and importance that the aesthetic beauty held in the physical attribute theme. The narratives of respondents in the low social bonding cluster did not differ from the other clusters in regards to 'recreational opportunity' or 'proximity to home.'

Members of this cluster were proportionally more inclined to discuss the physical attributes of their favorite place. Almost all of the respondents mentioned at least one of four types of physical attributes (i.e., beauty, climate, serenity, and wildlife). The beauty of the place was cited by a majority of respondents in this cluster. In fact, although aesthetic beauty was mentioned by members of several of the clusters, only in the low social bonding cluster was aesthetic beauty mentioned by a majority of respondents. Hence, aesthetic beauty emerged as a sub-theme only from the narratives included in this cluster. Some statements

were specific to the way in which the symbolic aspects of natural settings embody transcendentalist views. For example, two individuals wrote that their special place had, "beauty, privacy, hiking" and "natural beauty, removed from most civilization." The first respondent indicated his favorite place as special because it provided solitude and privacy. Furthermore, lack of discussion of the built environment separated this cluster from the others, particularly the attached cluster. As exhibited in the second statement above, narratives in the statement reflected the notion that natural beauty is different and in some ways better than human constructed beauty.

**Mixed attachment cluster (n=97).** Members of the mixed attachment cluster cited physical attributes most often as the underlying reason for their favorite place being special. However, the respondents' statements did not differ in richness or descriptive content from any of the other clusters. Similarly, there was no distinction between these respondents and members of the other clusters concerning the 'proximity to home' theme. However, distinctions concerning 'recreational opportunity' and 'social interaction' were observed in the narratives of respondents who exhibited mixed-attachment.

Concerning recreational opportunities that places provide, one respondent indicated that the CNF had "dark skies for astronomy." This is a very functional description that the respondent used to set their favorite place apart from other settings. Although many respondents' statements were similar to statements identified previously, this was the only cluster to contain narratives that described the education or socialization that occurs through recreation in special places. The following statements support the findings of Kyle and Chick (2007) who illustrated that experiences shared between people in a specific setting are prominent in the construction of individuals' place meanings. "We hunt quail in this area (my son, my grandson and I). [It's a] great place to just walk for hours without seeing anyone," and "I went there with my family when I was a child-camping, hiking, etc." Similar to Hay's (1998) conclusion, these statements indicate that recreation in special places seems to provide the ability for older generations to pass down significant experiences and social histories to younger generations within families. Also, beyond the transference of knowledge and skills, meanings and values associated with nature are passed along (e.g., the importance of solitude in the first statement).

Lastly, social interaction for its own sake was commonly cited by members of this cluster. Most of the responses were similar to those cited in the other clusters; however, a unique attribute of the responses in this cluster was that a few respondents identified positive social interaction with people who may not be friends or family members (i.e., people unknown to the respondent). For example, "Old town quaintness, fishing, people friendly" and "Beautiful, I am involved in scouting." These statements cite interaction with general people in the town and people in a civic organization. Hence, these respondents support the assertion that places provided a basis for social involvement and social interaction. Reciprocally, social interaction among people actively creates the symbolic meanings that are ascribed to a place (Eisenhauer, Krannich, & Blahna, 2000; Hay, 1998).



**Low attachment cluster (n=21).** The themes we identified in the statements by members of the low attachment cluster were similar to those we identified for the other clusters (i.e., 'physical attributes,' 'recreational activities,' 'proximity to home,' and 'social interaction'). The defining characteristic of the meanings identified by members of this cluster was that the proportion of respondents whose descriptions fit within each of our themes was considerably lower. That is, each respondent's statement contained wording that was less descriptive and only fit into a couple of our themes rather than three or four as was the case with the attached cluster.

The physical attributes that members of the low overall attachment group noted were attributes such as the "quiet, serene, quaint, natural beautiful area," "close, running water, plants," and the "quiet water source." These statements reflected some of the same ideals that by members of the other clusters expressed; however, these respondents mainly listed descriptors of physical attributes and rarely indicated that they associated emotions with those attributes. Compared to the other clusters, proportionally fewer respondents associated recreational activities with their favorite place. When activities were mentioned, responses typically lacked the rich description reflected in the attached cluster's responses and tended to rest on the setting's functional value. For example, one respondent wrote "horseback riding and hiking" and another responded merely "snow activities."

Furthermore, members of this cluster wrote proportionally fewer statements than the other respondents regarding the 'proximity to home' and 'social interaction' themes. However, their statements did not differ in descriptive content. For example, the responses "I live here," and "close to home but far enough away" did not elicit different meanings from those already identified. Likewise, "my family before me vacationed in the Laguna Mountains for about 100 years;" and "the town has a nice atmosphere for taking a family day trip" are similar to those in the attached cluster. Hence, the meanings associated with the 'social interaction' and 'proximity to home' themes did not differ based on the intensity of the respondents' attachments.

In summary, the results illustrated that respondents with different profiles of attachment associated different sets of meanings with their favorite or special places in the CNF. Four meaning themes emerged from our interpretation of the respondents' narratives: 'physical attributes,' 'recreational opportunity,' 'social interaction,' and 'proximity to home.' Although these categories were generally consistent across the five profile groups (i.e., the clusters based on place attachment dimension intensities), there was nuanced, but distinct variation in the identified sub-themes.

## Discussion

Our purpose was to explore the association between the intensity of respondents' attachment to a natural resource setting and the meanings they ascribed to that setting. This investigation was one of a few that have identified place meanings among a large sample. There seems to be some commonality between

the meanings described in small-sample studies (e.g., Gunderson & Watson, 2007; Manzo, 2005) and those present in ours. Moreover, we observed that there were variations in the sub-themes of the meanings ascribed to the CNF across varying levels of attachment intensity (Table 3). In the following, we provide possible explanations for these observations and then suggest potential implications for place attachment measurement.

We observed that the meanings that members of the attached cluster ascribed to the CNF are differentiated from the other clusters by the inclusion of meanings related to the 'comfort' sub-theme of the 'physical attributes' theme and the 'memories of shared experiences' in 'social interaction' theme. For these respondents who lived near the CNF, the association between comfort and higher intensities of attachment may be related to the ease of repeatedly accessing the CNF. This is because through repeated interaction with a setting an individual gains an understanding of a site's many attributes. In turn, the familiarity the individual has with a site is cultivated and a feeling of comfort is formed. At the same time, interactions in the natural environment often occur in the context of leisure, where the constraints of personal and societal expectation are fewer than in other contexts (Iso-Ahola, 1980). Hence, the lack of constraints an individual perceives may contribute to their comfort level leading to greater attachment intensity.

Members of the attached cluster were also differentiated from members of other clusters in that their narratives placed much more emphasis on the memories of shared experiences in regard to the 'social interaction' theme. It is possible that, through reflecting on these memories, attachment increases and meanings are formed through a strengthened emotional bond and processes of identity expression/confirmation. Future research should continue to investigate the phenomena that surround the development of place meanings and attachment intensity.

Respondents in the socially bonded cluster were the only ones to describe their meanings in terms of: naturalistic value and presence of human impacts related to the setting's physical attributes; distinct opportunities for recreational activities; and social interaction in non-recreational activities. The association between these meanings in the respondents' narratives and their higher intensity of social ties to the CNF may be a result of the social worlds with which the individual experiences the CNF. It is likely that the respondents visit the CNF with others who share common values regarding the environment (whether preservation or economic gain) and/or common recreational goals. Their interpersonal relationships may be nurtured by these common values and shared experiences in the CNF, thus leading to the individuals' attachment to the CNF. Clearly, future research is needed to test this hypothesis.

Beyond the lack of support for a social interaction theme in the respondents' narratives, the defining characteristic of the low social bonding cluster was the prominence of the 'physical attributes' theme, particularly the dominance of the sub-theme of 'aesthetic beauty' in the respondents statements. We suggest that the lower intensity of attachment reported by the respondents as opposed to members of the attached and socially bonded clusters, is associated with our observations that these respondents meanings' focused on the physical attributes of the setting

and did not include detailed thoughts about their interactions with others in the setting or descriptions of unique interactions with the setting while recreating. Hence, we propose that higher levels of attachment are associated with a diverse set of meanings that include references to the cognitive, conative, and affective experiences an individual associates with a place.

Members of the mixed attachment cluster were the only respondents to cite the importance of education, socialization, and their interaction with unknown people as reasons why their favorite place in the CNF was special to them. Although these respondents' narratives included descriptions of social interaction similar to those in the socially bonded and attached clusters, their language indicated that their interactions were more constrained. That is, these individuals described interactions with organized groups or outings with friends and family that were centered on learning a specific skill. Since these respondents did not describe their individual interactions with the CNF, we might infer that they have not developed an individual relationship with the place. If this is the case, then they may not have had the opportunity to develop the same intensity of attachment as others. Again, future research should investigate the phenomenon of meaning and attachment formation.

Finally, while the brevity of statements made by the low attachment cluster may be due to the inability of a researcher to probe on a written survey, we think this is unlikely because if the instrument was the source of the brevity we would have expected to see the same lack of detail in the responses across all five clusters. This was not the case. Hence, our observation suggests that respondents who have not formed distinct meanings do not have a reference point upon which to base their intensity of attachment. Thus, they reported low-attachment.

The one theme that we did not find to contain varying sub-themes across the five clusters was 'proximity to home.' Although this theme may be an artifact of our sampling framework (i.e., we sampled only people who resided within a half mile of the forest), it also may suggest that 'proximity to home' is a meaning that is developed early in the attachment process and is important to the development of further meanings. This notion is supported by previous research which has indicated that ease of access allows for repeated experiences in a setting and interaction with the environment which in turn foster an increase in the intensity of people's attachment to a place (Mesch & Manor, 1998; Moore & Graefe, 1994).

Although the purpose of this paper was not to critique or refine current measures of place attachment, these findings have implications for the measurement of place attachment. The first implication relates to the discriminate validity of multidimensional place attachment scales. Our identification of the different meanings that were associated with the differing mean scores of the place attachment dimensions supports the multi-dimensional conceptualization of place attachment. That is, Kyle et al.'s (2004) conceptualization of place identity, place dependence, social bonding, and affective attachment as related, but unique, dimensions of the human-place bond was supported. Hence, place research should continue to embrace multi-dimensional scales.

Related to validity concerns, Williams and Vaske (2003) stated that place attachment scales should provide insight as to "how one feels about various places"

(p. 838). It is clear that the measure of attachment intensity used in this study reflects, at least, some of the distinct meanings the respondents ascribed to the CNF. However, defining levels of intensity for each dimension that correspond with particular meanings was beyond the scope of this study. That said, our data does provide some suggestions for future research. Given that the differences in meanings occurred at the sub-theme level more work needs to be aimed at increasing the sensitivity of place attachment measures. For example, respondents' feelings about social interaction went beyond relationships with family and friends, however the items included in the measurement of the social bonding dimension only referenced family and friends. Furthermore, while the meanings concerning the distinct recreational activities afforded by the CNF can be measured, in some ways, by the place identity and place dependence items, these items nor the items included in the affective attachment dimension are not sensitive enough to differentiate between the feelings (e.g., comfort) or values (e.g., naturalistic) the respondents held. In sum, the more sensitive the items the better the scale will reflect the nuances in the meanings individuals ascribe to the setting. This will provide insight into the formation of attachment and a better understanding of how attachment relates to other constructs, including management decisions.

As a final point, beyond the limitations described earlier (e.g., a predominately white, middle-class sample with values that reflect such) it is also important to note that the process of identifying themes that emerged from the sample's responses places an artificial abstraction on the respondents' actual experience of place. That is, our respondents probably did not consider their level of attachment as they were engaged in activities in their favorite setting, nor did they consciously recognize the relationship between place meaning and attachment. Hence, asking respondents to report their thoughts and feelings about the CNF after interacting with the setting may not reflect the subconscious processes they experience while forming meanings and attachment (Kyle & Chick, 2007; Tuan, 1977). However, it was evident that the respondents are aware of the meanings they associate with their favorite places. For them, it is the totality of these meanings that is important to how they conceive of the place.

To conclude, these findings contribute to the place literature by indicating that, the meanings that individuals ascribe to the setting are associated with their intensity of place attachment. The next step in this line of research should be a mixed-methods study that begins with the qualitative identification of the meanings associated with a natural resource setting. Then design a survey instrument, using an index based on the meanings identified and a place attachment scale, to quantify the relationship between certain meanings and intensities of attachment. This type of study will be helpful in future scale development and further assessing the construct validity of current quantitative measures of place attachment.

## References

- Bentler, P. M., & Bonnett, D. G. (1980). Significance tests and goodness-of-fit in the analysis of covariance structures. *Psychological Bulletin*, 88, 588-606.
- Bricker, K., & Kerstetter, D. (2000). Level of specialization and place attachment: An exploratory study of whitewater recreationists. *Leisure Sciences*, 22, 233-257.
- Bricker, K. S., & Kerstetter, D. L. (2002). An interpretation of special place meanings with whitewater recreationists attach to the South Fork of the American River. *Tourism Geographies*, 4(4), 396-425.
- Byrne, B. M. (1998). *Structural equation modeling with LISREL, PRELIS, and SIMPLIS: Basic concepts, applications, and programming*. Mahwah, NJ: Lawrence Erlbaum.
- Cuba, L., & Hummon, D. M. (1993). A place to call home: Identification with dwelling, community, and region. *The Sociological Quarterly*, 34(1), 111-131.
- Dillman, D. A. (2000). *Mail and internet surveys: The tailored design method*. New York: Wiley.
- Eisenhauer, B. W., Krannich, R. S., & Blahna, D. J. (2000). Attachments to special places on public lands: An analysis of activities, reason for attachments, and community connections. *Society and Natural Resources*, 13, 421-441.
- Emerson, R. W. (1836). *Nature*. Boston: James Munroe.
- Greider, T., & Garkovich, L. (1994). Landscapes: The social construction of nature and the environment. *Rural Sociology*, 59, 1-24.
- Gunderson, K., & Watson, A. (2007). Understanding place meanings on the Bitterroot National Forest, Montana. *Society & Natural Resources*, 20(8), 705-721.
- Hammitt, W. E., Backlund, E. A., & Bixler, R. D. (2006). Place bonding for recreation places: Conceptual and empirical development. *Leisure Studies*, 25, 17-41.
- Hay, R. (1998). A rooted sense of place in cross-cultural perspective. *The Canadian Geographer*, 42(3), 245-266.
- Hidalgo, M. C., & Hernandez, B. (2001). Place attachment: Conceptual and empirical questions. *Journal of Environmental Psychology*, 21, 273-281.
- Hu, L., & Bentler, P. M. (1995). Evaluating model fit. In R. H. Hoyle (Ed.), *Structural equation modeling: Concepts issues and applications*. Thousand Oaks, CA: Sage.
- Hummon, D. M. (1992). Community attachment. In I. Altman & S. M. Low (Eds.), *Place attachment*. New York: Plenum Press.
- Iso-Ahola, S. (1980). *The social psychology of leisure and recreation*. Dubuque, IA: W. C. Brown.
- Johnson, C. Y. (1998). A consideration of collective memory in African American attachment to wildland recreation places. *Human Ecology Review*, 5(1), 5-15.
- Jorgensen, B. S., & Stedman, R. C. (2001). Sense of place as an attitude: Lakeshore owners' attitudes toward their properties. *Journal of Environmental Psychology*, 21, 233-248.
- Kaplan, R., & Kaplan, S. (1989). *The experience of nature: A psychological perspective*. New York: Cambridge University Press.
- Kaplan, R., Kaplan, S., & Ryan, R. L. (1998). *With people in mind: Design and management of everyday nature*. Washington, D.C.: Island Press.

- Kellert, S. (1996). *The value of life, biological diversity, and human society*. Washington, D.C.: Island Press.
- Kyle, G. T., & Chick, G. (2007). The social construction of a sense of place. *Leisure Sciences, 29*(3), 209 - 225.
- Kyle, G. T., Graefe, A. R., & Manning, R. (2005). Testing the dimensionality of place attachment in recreation settings. *Environment and Behavior, 37*(2), 153-177.
- Kyle, G. T., & Johnson, C. Y. (2008). Understanding cultural variation in place meaning. In: Kruger, L. E.; Hall, T. E.; & M. C. Stiefel (Eds), *Proceedings: Understanding Concepts of Place in Recreation Research and Management* (Gen. Tech. Rep. PNWGTR-698, pp.109-134). Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station.
- Kyle, G. T., Mowen, A. J., & Tarrant, M. (2004). Linking place preferences with place meaning: An examination of the relationship between place motivation and place attachment. *Journal of Environmental Psychology, 24*, 439-454.
- MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Bulletin, 1*, 130-149.
- Manzo, L. C. (2005). For better or worse: Exploring multiple dimensions of place meaning. *Journal of Environmental Psychology, 25*(1), 67-86.
- Merriam, S. B. (1998). *Qualitative research and case study applications in education* (2nd ed.). San Francisco: Jossey-Bass.
- Mesch, G., & Manor, O. (1998). Social ties, environmental perception, and local attachment. *Environment and Behavior, 30*, 504-519.
- Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, CA: Sage.
- Milligan, G. W., & Cooper, M. C. (1987). Methodology review: Clustering methods. *Applied Psychological Measurement, 11*(4), 329-354.
- Milligan, M. J. (1998). Interactional past and potential: The social construction of place attachment. *Symbolic Interactionism, 21*, 1-33.
- Moore, R. L., & Graefe, A. R. (1994). Attachments to recreation settings: The case of rail-trail users. *Forest Science, 49*(6), 877-884.
- Nasar, J. L. (2000). The evaluative image of places. In W. B. Walsh, Craik, K.H., & Price, R.H. (Ed.), *Person-environment psychology* (2nd ed). Manwah, NJ: Lawrence Erlbaum.
- Pretty, G. H., Chipuer, H. M., & Bramston, P. (2003). Sense of place amongst adolescents and adults in two rural Australian Towns: The discriminating features of place attachment, sense of community and place dependence in relation to place identity. *Journal of Environmental Psychology, 23*(3), 273-287.
- Proshansky, H. M. (1978). The city and self-identity. *Environment and Behavior, 10*(2), 147-169.
- Rowles, G. D. (1983). Place and personal identity in old age: Observations from Appalachia. *Journal of Environmental Psychology, 3*, 299-313.
- Schroeder, H. W. (1996). *Voices from Michigan's Black River: Obtaining information on 'special places' for natural resource planning*. General Technical Report NC-184. St. Paul, MN: US Department of Agriculture, Forest Service, North Central Forest Experiment Station.

- Stedman, R. C. (2002). Toward a social psychology of place-predicting behavior from place-based cognitions, attitude, and identity. *Environment and Behavior*, 34(5), 561-581.
- 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.
- Stedman, R. (2006). Understanding place attachment among second home owners. *American Behavioral Scientist*, 50(2), 187-205.
- Stieger, J. H., & Lind, J. C. (1980). Statistically based tests for the number of common factors. Paper presented at the Psychometric Society Annual Meeting. (June).
- Stokols, D., & Shumaker, S. A. (1981) People and places: A transactional view of settings. In Harvey, J. (Ed.), *Cognition, social behaviour and the environment* (pp. 441-488). Hillsdale, NJ: Erlbaum.
- Stokowski, P. A. (2002). Languages of place and discourses of power- Constructing new sense of place. *Journal of Leisure Research*, 34(4), 368-382.
- Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory*. Thousand Oaks, CA: Sage.
- Tashakkori, A., & Teddlie, C. (2003). *Handbook of mixed methods in social & behavioral research: Then and now*. Thousand Oaks, CA: Sage.
- Thoreau, H. D. (1854). *Walden*. Boston: Ticknor and Fields.
- Trentelman, C. K. (2009). Place attachment and community attachment: A primer grounded in the lived experience of a community sociologist. *Society and Natural Resources*, 22, 191-210.
- Tuan, Y. F. (1977). *Space and place: The perspective of experience*. St. Paul.
- Tuan, Y. F. (1980). Rootedness versus sense of place. *Landscape*, 24, 3-8.
- Twigger-Ross, C. L., & Uzzell, D. L. (1996). Place and identity processes. *Journal of Environmental Psychology*, 16, 205-220.
- Ulrich, R. S. (Ed.). (1991). *Psychophysiological indicators of leisure*. State College, PA.: Venture.
- Vorkinn, M., & Riese, H. (2001). Environmental concern in a local context: The significance of place attachment. *Environment and Behavior*, 33(2), 249-263.
- Williams, D. R., & Patterson, M. E. (1999). Environmental psychology: Mapping landscape meanings for ecosystem management. In H. K. Cordell & J. Bergstrom (Eds.), *Integrating social sciences and ecosystem management* (pp. 141-160). Champaign, IL: Sagamore.
- Williams, D. R., Patterson, M. E., Roggenbuck, J. W., & Watson, A. E. (1992). Beyond the commodity metaphor: Examining emotional and symbolic attachment to place. *Leisure Sciences*, 14, 29-46.
- Williams, D. R., & Vaske, J. J. (2003). The measurement of place attachment: Validity and generalizability of a psychometric approach. *Forest Science*, 49(6), 830-840.
- Yung, L. Freimund, W. A., & Belsky, J. M. (2003). The politics of place: Understanding meaning, common ground, and political difference on the Rocky Mountain Front. *Forest Science*, 49(6), 855-866.