

## Experience Use History, Place Bonding and Resource Substitution of Trout Anglers During Recreation Engagements

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Experience use history (EUH) was hypothesized to be linked to recreational place bonding and resource substitution behavior. Trout anglers ( $n = 203$ ) of two Trout Unlimited chapters were surveyed (response rate = 71%) for EUH, place bonding, and resource substitution. Four classifications (Beginners, Visitors, Locals, and Veterans) of EUH were formed, a 26-item scale was rated to form five dimensions of place bonding (Familiarity, Belongingness, Identity, Dependence, and Rootedness), and number of alternative equivalent streams recorded as resource substitutes. The EUH classifications were shown to be linked to different types and degree of place bonding, and to a lesser degree, with substitution behavior among trout anglers. Veterans and Locals had higher degrees of place bonding, while Veterans and Visitors had the highest degree of substitution behavior.

**KEYWORDS:** *Past experience, place attachment, substitution, outdoor recreation, angling.*

### Introduction

Certain types of wildland recreation activities (e.g., trout fly-fishing) can be characterized as having users who repeatedly use a limited number of specific resources (e.g., high quality mountain streams), who can become quite knowledgeable and bonded to these specific places, and who may be reluctant to use alternate places. The individual components of this hypothesized recreation behavior phenomenon have been conceptualized and researched by various individuals under the constructs of experience use history (Hammitt & McDonald, 1983; Schreyer, Lime, & Williams, 1984), place

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bonding/attachment (Williams & Patterson, 1996; Korpela, Hartig, Kaiser, & Fuhrer, 2001), and resource substitution (Shelby & Vaske, 1991). However, the relationships among experience use history (EUH), recreation place bonding, and recreation resource substitution have not been fully researched (Manning, 1999). This study aims to further examine the relationships among these three constructs.

It is important and relevant to outdoor recreation behavior and management that we better understand the linkages among these three behavioral constructs (Kruger & Jakes, 2003). In recreation behavior, similar to consumer behavior, individuals can become very habitual in site and product use, become very committed and loyal to certain sites and products, and be reluctant to use alternative sites and products, respectively (Havitz & Dimanche, 1997). This practice can be both advantageous and disadvantageous to managers, whether associated with recreation or business. Specific to recreation resource management, user perceptions and reactions to closures of favorite areas, regulations on activity and place habitual uses, needs to re-allocate, shift or disperse long held uses from crowded and/or impacted sites, and invading new activities to traditional use areas, are only a few of the management issues associated with EUH, place bonding, and resource substitution. Very experienced user groups that are quite bonded to certain sites and habitual in their use patterns are commonly a "special interest group" that managers must deal with when making management decisions. On the other hand, these same user groups can be quite predictable in terms of resource use patterns, attachment to the resource base and support of managing agencies, and be a strong focus group-constituent when making resource management decisions.

The purpose of the paper is to investigate the relationships among EUH, the degree of place bonding, and stream substitution behavior of a select group of experienced trout anglers for a Wild and Scenic stream in the Southern Appalachian Mountains. More specifically, the research analyzes the relationship of an index measure and user classification of EUH to five proposed dimensions of place bonding, and to the number of similar fishing substitute streams of respondents. In particular, EUH is tested for its ability to differentiate among some newly formed dimensions of place bonding and associated substitution behaviors.

While the investigation involves some constructs that may have been previously conceptualized as components of recreation specialization (Bryan, 1977; Bricker & Kerstetter, 2002), the purpose of this paper is not to analyze the three constructs in the context of "recreation specialization," nor as indicator variables of the multi-faceted specialization construct. The relationship among the constructs of EUH, place bonding, and substitution is not, nor meant to be, a sufficient conceptualization of the complex specialization issue (Scott & Shafer, 2001). Therefore, the literature review to follow is limited to a review of EUH, place bonding, and resource substitution as individual constructs and what is known concerning relationships among them.

## Related Research

### *Experience Use History*

Experience use history (EUH) refers to the amount of past experience, usually measured in terms of total visits, total years of use, and frequency per year of participation with an activity and/or resource at a specific site and/or other sites (Hammitt & McDonald, 1983; Schreyer et al., 1984). EUH has been shown to have many dimensions, including past experience with a specific study site and past experience with other similar sites.

Experience use history research has been driven by the premise that experienced users have a substantially greater knowledge base concerning activities and/or resource places, are more familiar, and therefore have a richer cognitive, and perhaps affective, basis for evaluating resource settings and use (Schreyer et al., 1984; Manning, 1999). Use experience, by definition, is cumulative over time, and some researchers have defined EUH as a spectrum, where recreationists begin as novices and may become experienced veterans (Schreyer et al., 1984). Using the three river recreation variables of (1) number of times users floated the study river, (2) number of other rivers users had floated, and (3) total number of river trips taken, Schreyer et al. formed an index measure of EUH. Based on combinations of the three river use experience variables, six types of river users were identified: novices, beginners, locals, collectors, visitors, and veterans. These six experience levels of recreationists have been found to differ significantly in terms of participation motivations, perceived conflicts, and attitudes toward management practices (Schreyer et al.; Williams, Schreyer, & Knopf, 1990).

Two studies have investigated the past use experience of anglers (Ditton, Loomis, & Choi, 1992; Choi, Loomis, & Ditton, 1994). Based on days fishing in the previous 12 months, four experience groups of anglers were formed by placing approximately 25% of anglers in each group (e.g., Group A had the least number of fishing days and D the most). More experienced anglers were found to be more highly interested in catching trophy fish and reading fishing related publications.

In summary, EUH has been demonstrated in past research to be an indicator variable linked to a number of recreation user perception, behavior, and management preferences. It has also been shown to be linked to other experience-related and behavior constructs such as place bonding.

### *Place Bonding*

Tuan (1976) introduced the concept of "geopiety," which refers to an individual's bonding to nature, in general, and specific places in particular. Resource place bonding suggests that over repeated exposures with a place and through transactional processes of place-people interactions places take on an identity of their own (Fishwick & Vining, 1992). People often develop a familiarity, person-place coupling, a sense of belonging, and even a de-

pendence on recreation places, to the extent that these places become "their place," "a favorite place," or "the only place" for specific types of pursuits (Roberts, 1996; Korpela et al., 2001).

Recreation resource researchers have traditionally conceptualized the bonding phenomenon between users and resources as place attachment, and consisting of the two major dimensions of place identity and dependence (Williams et al., 1992; Moore & Graefe, 1994; Williams & Vaske, 2003). As will be supported later in the paper, we have deviated somewhat from the place attachment tradition by using the bonding terminology and three additional bonding dimensions to the more prevalent dimension of Identity and Dependence. Place identity has been traditionally defined as a "sub-structure of the self-identity of the person consisting of broadly conceived cognitions about the physical world in which the individual lives" (Proshansky, Fabian, & Kaminoff, 1983, p. 59). It refers to "the symbolic importance of a place as a repository for emotions and relationships that give meaning and purpose to life" (Williams & Vaske, 2003, p. 6). Place dependence is defined in terms of a functional reliance on a place, reflected in the importance of a place at providing features and conditions that support specific goals and desired activities (Stokols & Shumaker, 1981; Williams & Roggenbuck, 1989). Dependence is based on an individual's or group's assessment of the quality of a place and the relative quality of alternative places (e.g., substitutes). An individual's awareness, EUH, and familiarity with alternative places, travel, mobility, and the specificity of the resource place they require affect the place dependence assessment (Stokols & Schumaker, 1983).

The study of past experience in relationship to recreation place bonding has been investigated by a few researchers (Bricker & Kerstetter, 2000; Moore & Graefe, 1994; Williams, Patterson, Roggenbuck, & Watson, 1992). In a study of trail users, Moore and Graefe found the best predictor of place attachment (in terms of place identity) was years of use, and though less important, frequency of trail use was a significant predictor of place dependency. Williams and colleagues also found that the amount of past experience was highly correlated with degree of the place attachment dimensions of Identity and Dependence. However, it becomes problematic when investigating the causal order of these two constructs, for conceptually EUH may lead to more attachment with a place or place attachment may make one want to visit a specific place more? Unfortunately, no empirical research has been conducted on the causal order of the conceptual relationship.

Some researchers have criticized the lack of clarity in conceptualizing the place attachment/bonding construct (Giuliani & Feldman, 1993), and others have proposed additional dimensions to the concept beyond place identity and dependence (Hammit & Stewart, 1996; Hay, 1998; Jorgensen & Stedman, 2001). Hay, in particular, provides a concise review of the many dimensions used to conceptualize the place bonding phenomenon. This current paper reports an analysis of a five dimensional model of place bonding, consisting of place familiarity, belongingness, identity, dependence, and root-

edness.<sup>1</sup> Place familiarity refers to the initial stages of the bonding process, which involves a sense of place knowing, security, and environmental preference that results from acquaintances and remembrances associated with special places (Acredolo, 1982). The familiarity process identifies environmental spaces, helps one to develop a sense of place for resource areas, and thus begins a human-to-place "structural coupling" (Roberts, 1996). While familiarity for a place may or may not be linked to place bonding, familiarity with special, preferred recreation places often has an affective component associated with it (Kaplan & Kaplan, 1989). With place familiarity, people often see these places differently, feel differently about them, and commonly want to bond with them more. Place belongingness involves a more social level of bonding with a place in that people feel affiliated with the place, as though they hold "membership" and are a part of a resource place (Milligan, 1998). More so than familiarity, place belongingness may entail altruistic feelings toward social and physical environments shared by neighbors, or in the case of leisure, other recreationists (Proshansky et al., 1983). Place identity and dependence were both conceptualized as by previous recreation researchers (Williams et al., 1992). The place rootedness dimension refers to the bonding situation wherein people become so bonded to a specific place that they long for very few or no other place to recreate. They become quite settled, possessive, and rooted in a specific recreation place and have little desire for another place (Hay, 1998). Hummon (1992) characterizes this level of bonding to a place as "everyday rootedness," while Shumaker and Taylor (1983) reference the work of Riger and Lavrakas (1981) in reporting the potential bonding dimension of rootedness in work and recreation settings.

The bonding dimensions of place dependence and rootedness, because they involve bonding to only a few or possibly one specific resource place, would seem to restrict the behavior of resource substitution, the next topic of review.

### *Resource Substitution*

Resource substitution becomes a particular problem when the demand for specific recreation resources outstrips the supply of those resources (Cordell, 1976). Recreation resource substitution, however, is more than a wildland recreation activity/resource specific, demand-supply management problem. Recreation resource substitutes are also activities, and/or resources, where similar recreation motivations, needs, and benefits can be achieved, and that can provide a similar resource experience, respectively (Brunson & Shelby, 1993; Hendee & Burdge, 1974; Iso Ahola, 1986). This behavioral component of recreation resource substitution can become a particular concern with resource specific activities because the resource users

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<sup>1</sup>Another paper under Journal review develops the conceptual basis of the proposed five dimensional bonding model. Therefore, only brief conceptual definitions are offered in this paper.

may be experienced individuals who have developed a strong bond with resource places and may be reluctant to leave a "favorite" resource place for a substitute, alternative place (Korpela et al., 2001).

Previous research into recreation resource place bonding and substitution has suggested that the greater the attachment, the less likely an individual is to make a resource substitution. Williams et al. (1982) asked back-country users how willing they were to substitute another area for the place they were recreating. Results showed willingness to substitute was associated with lower place attachment scores. Kaltenborn (1998) found that residents with a developed sense of place for the Svalbard Archipelago in Norway were less likely to be displaced from their recreation patterns and places than those with a less strong sense of place.

Fly-anglers on the Metolious River in Oregon indicated that the importance of activity attributes was inversely related to the number of resource substitutes and the perceived quality of the substitutes. Most telling from the study was the finding that 95% of the anglers would fly-fish someplace else rather than find substitute activities. The authors suggested studying the resource substitution behaviors of recreationists may be more important than investigations into what activities are substitutes for each other (Manfredo & Anderson, 1982).

Additional research into resource substitutes has yielded similar information. Salmon anglers in New Zealand (Shelby, 1985; Shelby & Vaske, 1991) reported that some rivers were substitutes for each other but, based on an exploration of the tradeoffs that would be made if a substitution were to occur, the substitutes were not equivalent. A second part of the study asked respondents to indicate why other rivers were not substitutes. The reasons most often cited included "that the drive was too long," "going to the substitute was too expensive," and "there were fewer salmon at the alternatives." Even when there are more fish at alternative places, questions still remain as to why certain resource areas appear equivalent, or even better, but are not used as substitutable places (Ditton, Goodale, & Johnsen, 1975). We would speculate that another explanation may be that certain resource places are not perceived as substitutes because of the habitual use patterns and affective bonds that anglers may form with certain resource sites. If so, one could postulate that as the bonding to a specific site increases, the number of substitutable alternative sites perceived would decrease.

In summary, the related literature indicates that relationships exist between various combinations of two of the three constructs proposed for study. We propose that all three constructs should be related, that is, EUH is a use-experience, developmental variable that should be related to the use related, developmental variable of place bonding, which should be linked to user willingness to substitute among resource alternative places. Both the degree of use history and bonding that users feel for a specific resource, and their willingness to substitute alternative places for bonded places, can have management implications for resource managers.

## Methods

### *Study Area*

Experienced trout anglers were surveyed in 2001 for their experience use history, place bonding, and resource substitution behavior in reference to the Chattooga National Wild and Scenic River (CNWSR) in northwestern South Carolina. The Chattooga is located on the state border between Georgia and South Carolina in Sumter and Chattahoochee National Forests. The river is well known for trout fishing and whitewater rafting.

### *Research Participants*

Members of the Chattooga River (S.C.) and Rabun (GA.) Chapters of Trout Unlimited were selected for the study. These two Chapters, with a combined membership of approximately 300 members, are the most affiliated and involved with management of the river. This sample was selected for examining the relationship of EUH to bonding and substitution because it was expected to be a broadly experienced group that contained some very experienced users who might be strongly bonded to the study resource, and reluctant to use alternative fishing streams. While this selected sample allows for testing the posited relationships, it does limit the generalizability of results.

Two hundred and ninety-two active members were mailed questionnaires, using a Dillman (2000) modified procedure (initial questionnaire mailing, post card reminder, second questionnaire mailing, final postcard reminder). Names and addresses of potential participants were obtained from membership lists of the two Trout Unlimited chapters. The questionnaire, consisting of eight pages and a postage paid return envelope, was mailed to anglers during June through August 2001. Seventy-one percent returned usable questionnaires. Respondents were predominantly male (97.5%), college educated (88.6%), and averaged 54 years of age.

### *Data Collection and Reduction*

*Experience use history.* EUH was measured using six questions, assessing years and frequency last year of using both the Chattooga River and other local streams. Specific questions asked trout anglers how many total times ever, total years, and times last year, they fished the study site, as well as the number of total times, total years and frequency last year, they fished other local streams. For the purposes of this paper, four variables were used to form an EUH classification for the study river and alternate rivers, based on previous research (Hammit & McDonald, 1983; Schreyer et al., 1984). These four variables included the total years and times last year fishing the study river, and other local rivers.

*Resource place bonding.* Two measures of place bonding were collected. An overall, evaluative indicator of place bonding was measured with a single item, asking anglers "Overall, how would you characterize your feelings of attachment to the Chattooga River." A seven point rating scale (1 = weak to 7 = strong) was used to record angler overall bonding with the river. Secondly, a 26-item multi-dimensional scale was developed to measure the five conceptualized dimensions of place bonding (e.g., familiarity, belongingness, identity, dependence, rootedness). Items were rated on a five point agreement basis, where 1 = strongly disagree and 5 = strongly agree. The 26 items were then factor analyzed, using confirmatory factor analysis (Ullman, 2001), to test the fit of items to the theorized five dimensions of place bonding. The structure of the hypothesized recreation place bonding model was examined using the five dimensions as latent variables with corresponding scale items as indicators. Maximum likelihood estimation was employed to estimate the model.

*Resource substitution.* Trout stream substitution was operationalized in three ways. First, respondents were asked about their substitute strategy if they could not fish the study site, based on the four choice typology of Shelby and Vaske (1991). Anglers were asked, "If you could not fish for trout at the Chattooga, what would you do?" They could choose to go trout fishing elsewhere, do some other activity at the Chattooga, take part in another activity somewhere else, or neither trout fish nor engage in another activity elsewhere. Next, anglers were asked, "If you could not fish for trout on the Chattooga, how many other local streams or rivers do you think can offer an experience that is just as good as the Chattooga?" Finally, research into activity substitutes has shown that there are differences between researchers and recreationists as to the evaluation of substitutes (Vaske, Donnelly, & Shelby, 1990; Vaske, Donnelly, & Tweed, 1983). To control this issue, respondents were asked to name their best substitute for the Chattooga, and then to gauge how they perceived the best substitute compared to the Chattooga, by using a 1 to 7 point scale where 1 = Not as Good, 4 = Equivalent, and 7 = Better. Exact wording of the item was, "Please rate how similar the trout fishing experience is at your best substitute compared to the Chattooga."

*Experience use history ratio.* Based on past research and suspected relationships among the constructs of resource-based EUH, place bonding, and resource substitution, it was hypothesized that level of EUH would be associated with the degree of place bonding and substitution behavior. For example, an angler with a high degree of EUH on the study river might be expected to have developed over time a high degree of bonding to the CNWSR, and this bonding may or may not be related to desire to seek out substitute rivers. Some EUH research has identified very experienced users as "collectors," individuals who seek experience on a number of different resource specific areas (Schreyer et al., 1984). However, the relationship is more complex than this, since EUH was measured on alternative streams as well as the study river. One could have a low degree of EUH on the study

		EUH on Substitute Rivers	
		Low	High
EUH on Chattooga River	Low	Beginners (L, L)  n=67	Visitors (L, H)  n=25
	High	Locals (H, L)  n=22	Veterans (H, H)  n=66

Figure 1. Classification of trout anglers based on Experience Use History (EUH) on study river and substitute rivers.<sup>1,2</sup>

- <sup>1</sup> BEGINNERS: Anglers with low EUH on both the study river and other rivers.
- VISITORS: Anglers with low EUH on the study river but high EUH on other rivers.
- LOCALS: Anglers with high EUH on the study river but low EUH on other rivers.
- VETERANS: Anglers with high EUH on both the study river and other rivers.

<sup>2</sup> See Table 1 for the Low and High mean values for each of the four EUH classifications.

**TABLE 1**  
*Mean Values for the Experience Use History (EUH) Variables Comprising the Four EUH Classifications of Anglers*

EUH Variables	Beginners	Visitors (means)	Locals	Veterans	F	P
Years fishing CNWSR <sup>1</sup>	6.58	6.40	17.05	25.42	61.08	.001
Times last year on CNWSR	3.01	3.48	21.05	15.97	8.18	.001
Years fishing other rivers	7.02	21.52	11.50	28.27	50.13	.001
Times last year on other rivers	5.42	38.12	7.09	34.45	2.83	.040

<sup>1</sup>CNWSR = Chattooga National Wild and Scenic River, SC.

river but a high EUH on alternative streams. In order to account for various levels and combinations of EUH on the study river and EUH on other rivers, an index ratio of EUH was computed and analyzed for its relationship to place bonding and substitution behavior.

*Computing EUH Ratio.* A ratio for EUH was computed for each angler of the study river by summing their years of fishing the CNWSR with the frequency last year fishing the CNWSR and dividing by the sum of the most experienced individual for each variable. Thus, the most experienced individual(s) had a quotient of 1.0 and all other users a ratio value less than 1.0. The resulting frequency of ratios were then divided into LOW and HIGH

groups, based on the median value of the ratios. The same procedure was done for the years and frequency of fishing on other rivers. Thus, LOW and HIGH levels of EUH resulted for both the study river and other rivers. Four combinations of LOW and HIGH levels of EUH were possible for anglers (Figure 1, Table 1). Based on the four combinations of LOW and HIGH levels of EUH, four classifications of anglers were identified, similar to four of the six used by Schreyer et al. (1984):

*Beginners*—Anglers with *low* EUH on both the study river and other rivers.

*Visitors*—Anglers with *low* EUH on the study river but *high* EUH on other rivers.

*Locals*—Anglers with *high* EUH on the study river but *low* EUH on other rivers.

*Veterans*—Anglers with *high* EUH on both the study river and other rivers.

Segmentation of the EUH variable to form a typology of four classes of anglers, based on the median LOW and HIGH halves of experience ratios, has its limitations. First, splitting the EUH ratios into low and high groups sacrifices the power of analysis<sup>2</sup> possible with continuous measures of the experience variables (Watson & Niccolucci, 1992), and perhaps the scientific understanding of the nature of relationships among the constructs. However, previous research has demonstrated the utility of the EUH typology in examining differences among managerially relevant subgroups. Secondly, medians were used as the bases of segmentation rather than means because of some outlier values for some extremely experienced anglers. Thirdly, methods of segmentation seem to be more of an art than a science, ranging from the 20/80 rule (use the upper 20 percent of respondents since they are responsible for 80% of much phenomena), to frequency quartiles, to standard deviations (portions of) around the mean, to cluster analysis. Since we were particularly interested in the utility of the EUH construct at differentiating among different aspects of a newly formed place bonding scale, and resource substitution behavior, we selected the EUH typology classification procedure of previous research (Schreyer et al., 1984).

### *Hypothesized Relationships*

Based on the EUH ratio classification, the following relationships were hypothesized for the four EUH categories of anglers and place bond/substitution variables (Figure 2).

1. *Place Bonding*. Locals, having considerable experience with the CNWSR but less experience with other rivers, will have the highest level of bonding with the study site. This hypothesis is based on the

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<sup>2</sup>The Associate Editor is acknowledged for contributing this point of knowledge.

Experience Use History	Place Bonding	Number of Substitutes	Substitute Similarity
Beginners (L, L)	Low Medium	Low	Low Medium
Visitors (L, H)	Low	High Medium	High
Locals (H, L)	High	Low Medium	Low
Veterans (H, H)	High Medium	High	High Medium

Figure 2. Hypothesized relationships (levels) among experience use history, place bonding, number of river substitutes, and similarity rating of substitutes.

assumption that place bonding is an exposure-time related, developmental relationship between EUH and level of place bonding. It is realized that other variables besides EUH are related to the place bonding process. Visitors, having the opposite EUH-exposure relationship, will have the lowest level of bonding with the study river. Veterans and Beginners will be in the middle, but the more experienced Veterans will have a higher level of place bonding with the CNWSR than Beginners. Again, these relationships are hypothesized on strictly EUH to place bonding associations, and not other influential variables. Also, causation is not inferred.

2. *Number of Substitute Rivers.* Veterans and Visitors, by classification definition, have the highest EUH with other rivers and, thus, should have the highest number of alternative streams. Veterans were hypothesized to have more substitutes than Visitors, related to their greater level of all types of experience. Beginners should have the lowest number of substitutes because they have not fished many places and cannot list as many substitute streams. Locals would be in the low medium range. An assumption of these hypotheses is that one must have experience on a river for it to be a substitute; vicarious experiences were not considered.
3. *Similarity Rating of Best Substitute.* Visitors, because of their low EUH with the CNWSR and high EUH on other rivers, have had more opportunity to develop a bonding with alternative rivers and would rate their *best* substitute river as equivalent or better than the CNWSR. The opposite could be true for the Locals (e.g., a low level of use exposure and opportunity to bond with other rivers would be related to anglers evaluating their best substitute as worst than the CNWSR). Veterans, having such a rich experience frame of reference with many rivers, would be more moderate evaluators than Visitors, but higher raters than Beginners (who have the least experience).

Analysis of variance (ANOVA) was used to test for mean differences and patterns of mean values among the four EUH classifications and the variables of place bonding, number of substitute rivers, and similarity of best substitutes.

## Results

### *Experience Use History*

The Trout Unlimited respondents were experienced anglers, both at the study site and at similar streams. The mean number of total years trout fishing (anywhere) was 32. On average, the anglers had fished the CNWSR for 15 years; however, some had never fished the CNWSR while the longest anyone had fished it was 53 years. Respondents made an average of 10 fishing trips to the CNWSR in the last 12 months. In terms of trout fishing other streams, anglers averaged 18 years of participation, with a frequency of 21 trips in the last 12 months. The anglers trout fished an average of eight streams last year, in addition to the study area.

### *Place Bonding*

Overall place bonding for the study site was fairly strong ( $M = 4.95$ ,  $SD = 1.47$ ; 7 point scale) among trout anglers. This might be expected, since the two Trout Unlimited chapters sampled were affiliated with the Chattooga River; members had fished the Chattooga for an average of 15 years, and nearly 25% felt the Chattooga was the best place for trout fishing. However, this means that 75% had other local places that were better for trout fishing.

The confirmatory factor analysis supported the five dimensional model of place bonding (Table 2; also see end note). The model when first tested yielded unacceptable support: Chi-square/Degrees of Freedom Ratio ( $\chi^2 / d.f.$ ) = 2.20, Comparative Fit Index (CFI) = 0.906 and Standardized Root-Mean Squared-Residual (SRMR) = 0.058. Post hoc modifications were performed in an attempt to develop a better fitting and more parsimonious model. On the basis of LaGrange multiplier, two items were dropped from the scale<sup>3</sup>, decreasing the  $\chi^2 / d.f.$  to 1.91, increasing the CFI to 0.930 and decreasing the SRMR (0.056). All three values were in the acceptable range, indicating that the data fit the conceptualized five dimension bonding model (Hu & Bentler, 1998).

All five bonding dimensions had acceptable reliability alphas (.79 to .91). Place Familiarity was the most reliable measure, followed closely by Identity and Dependence. The factor having the least internal consistency was Rootedness. Trout anglers agreed that they felt a sense of Belongingness and Identity to the Chattooga River, but not a bonding in terms of Dependence (factor  $M = 2.55$ ) and Rootedness (factor  $M = 1.83$ ). Four of the five dimensions differ significantly ( $p \leq 0.05$ ) from each other in terms of the strength of place bonding for anglers. Content interpretation of items within each dimension indicated that trout anglers had a fairly strong sense of fondness ( $M = 4.21$ ) and connectivity ( $M = 3.69$ ) to the study site (e.g., Belongingness), and that the Chattooga was a special place ( $M = 3.95$ ) that meant

<sup>3</sup>See Notes in Table 2 for the two items dropped from the model.

**TABLE 2**  
*Item Means, Factor Loadings and Uniqueness for the Confirmatory Factor Model of the Place Bonding Scale*

Factored Dimension (Item)	Item Mean	Factor Loading	SE	Uniqueness
<b>Familiarity</b> (Cronbach's alpha = .91; factor mean = 3.34)				
I could draw a rough map of the Chattooga.	3.43	.86	.07	.73
I have trout fished the Chattooga many times and I am quite familiar with it.	3.64	.87	.07	.76
I know the Chattooga like the back of my hand.	2.96	.90	.07	.80
<b>Place Belongingness</b> (Cronbach's alpha = .86; factor mean = 3.52)				
I feel connected to the Chattooga.	3.69	.84	.06	.71
I am fond of the Chattooga.	4.21	.70	.04	.49
The Chattooga makes me feel like no other place can.	3.09	.70	.07	.49
When I am at the Chattooga, I feel part of it.	3.69	.71	.06	.53
I feel like I belong at the Chattooga.	2.96	.82	.07	.68
<b>Place Identity</b> (Cronbach's alpha = .90; factor mean = 3.51)				
The Chattooga is very special to me.	3.95	.77	.06	.59
I am very attached to the Chattooga.	3.61	.90	.06	.80
The Chattooga means a great deal to me.	3.91	.90	.05	.81
I identify strongly with the Chattooga.	3.58	.88	.06	.77
Visiting the Chattooga says a great deal about who I am.	3.03	.64	.06	.41
I feel like the Chattooga is part of me.	3.00	.85	.06	.72
<b>Place Dependence</b> (Cronbach's alpha = .89; factor mean = 2.55)				
The Chattooga is the best place for trout fishing.	2.81	.69	.06	.48
Trout fishing on the Chattooga is more important to me than trout fishing any other river.	2.68	.78	.06	.60
No other place can compare to the Chattooga for trout fishing.	2.34	.73	.06	.53
I wouldn't substitute any other area for the trout fishing I do at the Chattooga.	2.37	.82	.06	.68
I get more satisfaction out of trout fishing the Chattooga than from trout fishing any other river.	2.42	.90	.06	.80
The trout fishing I do at the Chattooga I would enjoy just as much at a similar river or stream <sup>1</sup> .	3.29	.48	.08	.23
<b>Rootedness</b> (Cronbach's alpha = .79; factor mean = 1.83)				
The Chattooga is the only place I desire to trout fish.	1.96	.78	.05	.60
I rarely if ever trout fish any place other than the Chattooga.	2.03	.76	.06	.58
If I could not fish the Chattooga I would stop trout fishing.	2.98	.52	.05	.27
I consider only the Chattooga when I go trout fishing.	1.45	.73	.06	.54

Notes. Means based on 5-point agreement rating scale, where 1 = strongly disagree to 5 = strongly agree.

Two items were dropped from the scale, based on LaGrange multiplier results: Familiarity item; "I have many memories of trout fishing on the Chattooga" and Rootedness item; "The Chattooga is like a home to me."

Model:  $\chi^2$  /d.f. = 1.91; CFI = .93; SRMR = .06.

<sup>1</sup> Item reverse coded for analysis.

a great deal ( $M = 3.91$ ) to them (e.g., Identity). However, the trout anglers did not consider the Chattooga the only place to trout fish ( $M = 2.34$ ). Thus, the anglers who are familiar with the study site also have a fair degree of identity and sense of belongingness toward it, but are neither dependent on nor feel a degree of rootedness with the place.

This latter finding might be explained by the fact that the participants were quite experienced anglers and had knowledge and experience of other streams that can substitute for the study site. Use history data indicated that the anglers had fished eight local streams last year in addition to the Chattooga, and fished other streams an average of 18 times last year.

### *Resource Substitution*

An overwhelming majority (91.5%) of the anglers indicated that if they could not trout fish the CNWSR, they would trout fish on another stream rather than switch to another activity. When asked how many other streams they felt could offer an experience just as good as the CNWSR, 65% of anglers reported up to three substitutes. Nearly 14% indicated no equivalent substitute (Table 3). Anglers were also asked to identify their best substitute for the Chattooga and to rate how equivalent its trout fishing experience was compared to the CNWSR. Anglers listed 40 streams as best substitutes, of which about two-thirds were considered equivalent to the study area (e.g., average rating of 3.5 to 4.5 on the 7-point scale, where 4 = equivalent).

### *Testing Hypothesize Relationships*

Six measures of place bonding were tested and all found to vary significantly among the four EUH classes of anglers (Table 4). The pattern of means (e.g., Visitors low, Locals high, Veterans high medium, Beginner low medium) hypothesized in Figure 2 was an exact match for the variables of overall bonding and the bonding dimensions of Belongingness, Identity, and

TABLE 3  
*Number of Trout Fishing Streams Reported Equivalent (Substitutes)  
to the Study River (N = 155)*

Number of Streams	N	%
0	21	13.5
1	23	14.8
2	31	20.0
3	26	16.8
4	12	7.7
5	8	5.2
6	11	7.2
7+	23	14.8

TABLE 4  
*Mean Differences between Experience Use History Classes of Trout Anglers, and Place Bonding and Substitution Behavior*

Place Bonding and Substitution Variables	Experience Use History				$\Delta(\bar{x})^5$	F	P
	Beginners	Visitors	Locals	Veterans			
	Mean Scores <sup>4</sup>						
<b>Place Bonding</b>							
Overall Bonding <sup>1</sup>	4.44 <sup>a</sup>	4.32 <sup>a</sup>	5.86 <sup>b</sup>	5.54 <sup>b</sup>	1.54	13.04	.000
Familiarity <sup>2</sup>	2.73 <sup>a</sup>	2.96 <sup>a</sup>	3.77 <sup>b</sup>	4.01 <sup>b</sup>	1.28	26.09	.000
Belongingness <sup>2</sup>	3.32 <sup>ab</sup>	3.26 <sup>a</sup>	4.00 <sup>c</sup>	3.74 <sup>bc</sup>	.74	8.31	.000
Identity <sup>2</sup>	3.22 <sup>a</sup>	3.18 <sup>a</sup>	4.04 <sup>b</sup>	3.83 <sup>b</sup>	.86	12.38	.000
Dependence <sup>2</sup>	2.47 <sup>ab</sup>	2.33 <sup>a</sup>	2.92 <sup>b</sup>	2.67 <sup>ab</sup>	.59	3.09	.029
Rootedness <sup>2</sup>	1.86 <sup>a</sup>	1.66 <sup>a</sup>	2.26 <sup>b</sup>	1.77 <sup>a</sup>	.60	4.79	.003
<b>Substitution</b>							
Number of Rivers	2.45	3.95	3.39	4.07	1.62	2.05	.110
Similarity of Rating <sup>3</sup>	4.23	4.62	4.06	4.90	.84	2.64	.052

<sup>1</sup>Means based on 7-point scale; 1 = weak, 7 = strong.

<sup>2</sup>Means for Familiarity to Rootedness based on 5-point scale; 1 = strongly disagree, 5 = strongly agree.

<sup>3</sup>Means based on 7-point scale; 1 = not as good, 7 = better.

<sup>4</sup>Means with different superscripts are significantly different; Tukey HSD,  $p \leq 0.05$ .

<sup>5</sup> $\Delta(\bar{x})$  = change in means from low to highest value.

Dependence. Familiarity was partially supported in that Locals ( $M = 3.77$ ) and Veterans ( $M = 4.01$ ) had the highest levels of place bonding and Beginners ( $M = 2.73$ ) and Visitors ( $M = 2.96$ ) the lowest levels, but the exact order predicted in Figure 2 was not supported. Familiarity is the most cognitive/site knowledge based of the five bonding dimensions, and this may explain why Veterans (e.g., high experience) scored highest on Familiarity. For example, the more times one is exposed to a special place the greater the opportunity for acquiring knowledge about it and developing a sense of place (in terms of place knowing) for it (Kaplan & Kaplan, 1989). Rootedness was scored lowest by Visitors ( $M = 1.66$ ) and highest by Locals ( $M = 2.26$ ) as predicted in Figure 2. However, the predicted order did not hold up for Veterans and Beginners. Although the average degree of Rootedness for the study areas was quite low for all classes of anglers, the finding that Locals were most rooted to the area held true to prediction.

A cautionary note is in order concerning the relationship between EUH and place bonding. Even though all six of the bonding relationships tested were significant ( $p \leq 0.05$ ), and the hypothesized EUH relationships fairly strongly supported, effect size of the differences among means for the bonding domains were not great (change in means ranged from 0.59 to 1.54). Also, some of the mean differences among the EUH classes were not significant (Tukey HSD test,  $p \leq 0.05$ ). However, Locals and Veterans were significantly different from the Beginners and Visitors on most of the bonding variables (see Tukey results).

Support for the relationship between EUH and substitution behavior was not quite as strong and clear as for place bonding. The average number of substitute rivers for the four classes of anglers was in the pattern predicted, but the means were not statistically different. In terms of similarity rating, Veterans, on average, rated their best substitute streams better ( $M = 4.90$ ) than the CNWSR, while Locals rated their best substitute the lowest ( $M = 4.06$ ). It was hypothesized that Visitors, rather than Veterans, would have the highest rating. The mean differences among the four EUH type of anglers approached significance ( $p = 0.052$ ).

### Discussion and Conclusions

Schreyer et al. (1984) postulated that EUH represents the amount, type, and diversity of information available to an individual through previous experience, and it represents an experiential basis through which people evaluate recreation places. Other authors have stated that the information gained and experiential/cognitive models formed through repeated past experiences can be associated with an affective bond to places (Low & Altman, 1992; Moore & Graefe, 1994; Williams et al., 1992). Research has also hypothesized that place bonding is linked to resource substitution, for a strong bond to a particular place may be associated with low use of alternative places (Mesch & Manor, 1998; Stokols & Shumaker, 1981; Williams et al., 1992). The purpose of this paper was to report the amount, type, and diversity of

EUH, place bonding, and resource substitution among a selected group of trout anglers, and possible linkages among these three variables. Causal order among the three constructs was not empirically examined; for example, EUH may lead to place bonding or place bonding may lead to greater visitation. Likewise, strong place bonding with the study site could lead to little desire/use of alternative rivers, or experiencing a lot of alternative rivers, of which some may be equivalent or better for fishing than the study river, may moderate the level of bonding to the study site.

EUH is a multi-variable construct that has been measured many ways, the most traditional being an index combination of past participation variables. Past experience indices have been criticized from a mathematical perspective, for they aggregate variables and thus decrease the valid contribution of individual measures (Watson & Niccolucci, 1992). There are also concerns as to how the individual measures are combined to form the index (e.g., added or multiplied or weighted). Additional limitations were discussed in the Methods when describing how the EUH ratio was computed. However, for complex, multi-dimensional constructs such as quality of life, quality of the environment, attitudes, and the many facets of past experience, an index measure still remains a logical approach to capturing the construct validity of these complex concepts. Our study, while acknowledging its limitations concerning EUH, offers another approach to some of these operational concerns by using a ratio of past participation, median determined *high* and *low* experience levels, and classifications of anglers based on various combinations of experience levels. The approach was empirically meaningful from the perspective of determining relevant managerial subgroups and how they might be different in place bonding and substitution behavior with recreation places. The procedure and accompanying results also supplement previous EUH research and the resource management utility of the EUH construct.

The relevance and implications to recreation resource management of EUH and place bonding are becoming more evident in the scientific literature, and resource management field (Williams & Stewart, 1998; Kyle, Graefe, Manning, & Bacon, 2004). The recent entire issue of *Forest Science* (2003) devoted to resource place further illustrates this point. Rather than review the various implications of this place bonding literature to management, it is more relevant to consider the implications of our findings to the potential management of the Chattooga River and similar river places. As a case in point, the U.S. Forest Service is currently dealing with a controversy and management decision on the upper section of the CNWSR, the section used by Trout Unlimited members and the majority of trout anglers. The lower four sections of the CNWSR have been traditionally (last four decades) used by whitewater paddlers while the upper section has been reserved for trout fishing. It has been traditionally understood, though not legal, that paddlers had *their* portions of the river, and anglers had *their* section of the river. However, private paddlers, primarily adventure kayakers have petitioned the Forest Service to use the upper section of the CNWSR for pad-

dling. Public hearings during 2003 have demonstrated the relevance of place bonding among trout anglers, in particular, for the upper section of the river. Many veteran anglers of the CNWSR declared at the public hearings that the upper reaches of the river have traditionally been *their* place to fish, they had supported the management of the stream for years, and frankly, that kayakers had no right to use the upper section when they already had four sections to use. The kayakers stated that the numbers wanting to use the remote upper section of the CNWSR were few, were advanced users, and that their numbers and behavior would not interfere with the traditional trout angling in this section of the river. Whether managerially true or not, the degree of EUH and place bonding of trout anglers to the upper section of the CNWSR did not allow for them to accept the new user group to their traditional fishing resource. Even though the anglers are not strongly dependent and rooted to the CNWSR for fishing, per se, it became clear in the hearings that the CNWSR is a unique place to trout fish in terms of its wild, scenic, and natural habitat as compared to other local substitute streams, and anglers are quite bonded to the resources for many of these reasons. Bonding to resource places, and activities, is a complex phenomenon and no doubt, consists of multiple dimensions of site, use, and emotional attributes.

This study expanded the operational definition of recreation place bonding beyond the dimensions of Identity and Dependence. Other authors have suggested additional dimensions to these two, and our results offer initial support for the additional bonding dimensions of place Familiarity, Belongingness, and Rootedness. The confirmatory factor analysis of the bonding scale resulted in three or more items per factor and acceptable reliability alphas for each factor (Cronbach's alphas = .79 to .91). In terms of convergent validity, it was important that each of the place bonding dimensions varied significantly when compared with level of angler EUH classifications, as hypothesized. It should be noted that this study was designed to investigate the expanded place bonding dimensions with a group of recreationists that had some very experienced individuals (e.g., Trout Unlimited members) at a rather specific resource place (e.g., National Wild and Scenic River).<sup>4</sup> This was done so that the more experience-based dimensions like Dependence and Rootedness, in particular, might receive higher bond ratings by the more experienced respondents. Still, Rootedness with the study area was the weakest bond, even for *Local* anglers ( $M = 2.26$ ). This was somewhat unexpected, since trout fishing would seem more of a resource specific activity, especially among experienced and knowledgeable Trout Unlimited members, than many other less resource-based, outdoor recreation activities. However, the interrelationship between attachment to a recreation

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<sup>4</sup>While the study design is a limitation in terms of generalizability of results, very similar results were obtained with a less experienced group of whitewater paddlers on the same study site (paper submitted for journal review).

place, and to a recreation activity, can be quite complex. Attachment and commitment to a place may not be the same as commitments and attachment to an activity. As pointed out by the associated editor on this paper, it may be that "Trout Unlimited members like to FISH, no matter where," and are therefore not rooted to any particular place. Of course, this can be said of any recreation activity group; some may be more activity bonded while others more place bonded. This is important information for recreation resource managers to know, however, little information other than speculation exists for most recreation resource management activities and places.

There are other explanations, perhaps worth considering, as to why "Rootedness" was found to be a weak stage of bonding. Outdoor recreation places differ from more typical "rooted" places in that outdoor recreation places are areas people visit, not a permanent home or neighborhood community where one lives or spends extended periods of time. Also, the anglers of this study had alternative places (substitute streams) to fish, rather than limiting use (rooted) to only one place. Thus, while Rootedness has been shown to be associated with dwelling places, and home and community attachment (Mesch & Manor, 1998; Tuan, 1980), our research was unable to demonstrate it for a specific recreation place. In fact, only one of the five Rootedness items had agreement (agree + strongly agree) support beyond 8 percent of respondents. It could also be argued that the Rootedness scale, through reliable and an acceptable fit to the latent variable called "Rootedness," is not a valid construct measure of what trout anglers mean when they say they are "rooted" in a place. The sub-scale might benefit from further development, as well as further testing. However, the Dependence scale behaved similarly to the Rootedness scale, and it consisted of the same standard items as used by past recreation researchers.

Based on the analysis of the EUH classifications and type and degree of place bonding, it is concluded that level of EUH is linked to the bonding that can develop for experienced trout anglers and recreation places over time. While it is extremely difficult to measure the developmental processes by which internal states of place bonding occur, EUH has the potential to serve as a surrogate, and perhaps developmental indicator of the dimensions and degree of bonding (Schreyer et al., 1984). A logical next step in researching the linkage between EUH and place bonding from a developmental perspective would be to study the correlation of the two variables over time (e.g., experiential and longitudinal sampling).

The EUH classification of Beginner through Veteran functioned consistently with previous research, where it has differentiated among a number of different recreation behavioral variables, for example: golfer motivations and constraints (Petrick, Backman, Bixler, & Norman, 2001), river recreation motivations (Williams et al., 1990), and river use patterns, motivations, environmental and trip evaluations, conflict perceptions, and support for managerial intervention (Schreyer et al., 1984). Similar to previous findings, individuals with the most EUH (e.g., Veterans and Locals) were more alike in relationships, behavioral, and managerial variables, while those with the least

experience (e.g., Visitors and Beginners) were more similar. In our study, Locals had a high degree of EUH on the study river and the highest degree of place bonding, indicating perhaps they had more experience opportunities and related affective bonds with the place. They had less experience with other streams and perhaps, fewer substitutes to compare with the study river. Veterans, having a high EUH on all rivers and perhaps a richer knowledge base for making environmental evaluations, may have their place bonding to the study river moderated by their experiences on many other rivers. In other words, does the uniqueness and bonding to a single place change as one acquires experience on many other streams, some of which may be equivalent or better fishing streams? Somewhat puzzling was the finding that although Locals had the highest degree of place dependence, as predicted, they were still not very dependent on the study river ( $M = 2.92$ ). Since they have relatively low experience on other rivers, and a lot on the study river, it was hypothesized that they would be dependent on the study river. Possible explanations for the lack of place dependence may be: (1) there are other influential factors linked to place bonding besides EUH, (2) although the dependence items used were standard items that have shown good reliability across several studies (Williams & Vaske, 2003), the items may not capture the true construct validity of fishing place dependence among experienced trout anglers, (3) recreation place dependence may be less developed among trout anglers than for home and/or community dependence because trout anglers are only visitors, not long-term residents of recreation places, or (4) even though Locals had relatively lower experience on other streams, the majority at least had some experience or may know of other streams, and therefore feel little dependence on the CNWSR.

In conclusion, the following major points can be derived from the findings of this study.

1. Recreation place bonding can be conceptualized and analyzed for additional dimensions of bonding beyond the two traditional dimensions of Identity and Dependence. Just as other disciplines and fields of study have suggested and explored multiple dimensions of the place bonding construct, so might recreation behavior and the leisure sciences.
2. EUH, as demonstrated in past research, is related to various developmental concepts of recreation behavior, including place bonding. Although not proven as a causal variable of place bonding, EUH could be considered a covariant of recreation place bonding and analyzed for its contribution in the EUH-bonding relationship.
3. Degree and types of EUH and place bonding are related to resource substitution and other practical aspects of recreation resource management. Future research, in addition to advancing the developmental/validity aspects of place bonding measurement, needs to concentrate on modeling the utility of the place bond phenomenon in managing recreation behavior in resource places. For example,

recreation place bonding may be influential in understanding recreation displacement, willingness to pay for use of places, habitual use patterns of specific places, resource substitution behavior, and attitudes towards management policies and practices for bonded places.

#### End Note

1. Confirmatory factor analysis was initially used to test the *a priori*, conceptually developed, 5-items per dimension, 5-dimension place bonding scale. At the request of the Associate Editor, an exploratory factor analysis was also performed. The exploratory factor analysis suggested four dimensions, based on eigenvalues above one (12.14, 3.27, 1.40, 1.03; fifth = .95) and three-to-five dimensions based on a scree plot. The four dimensional model explained 69% of variance and the five dimensions 73%. Examination of factor loadings and on which factor preconceived items loaded indicated acceptable dimensions for Rootedness (4-items), Dependence (3-items), and Familiarity (3-items). However, the Identity and Belongingness items (10-items) loaded on the same factor, indicating that they are highly correlated and measuring the same concept. When a five factor *forced* model was computed, the fifth factor contained two items with weak loadings (.585 and .566) and they cross-loaded on two factors.

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