

Coping in outdoor recreation: Causes and consequences of crowding and conflict among community residents

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by Manning, Robert E, Valliere, William A

Displacement, product shift, and rationalization are coping mechanisms that can be adopted in response to crowding and conflict in outdoor recreation. Using survey methods, this study found relatively high levels of adoption of coping mechanisms by residents of communities in and around Acadia National Park, Maine in response to perceived increases in 1) overall recreation use levels, 2) selected recreation activities and 3) selected problem behaviors. While only 7.4% of respondents reported that they no longer use the carriage roads because of the changes in use that have occurred, nearly all respondents (94%) reported adopting one or more behavioral or cognitive coping mechanisms. Study findings suggest that coping may be pervasive in outdoor recreation, that coping includes behavioral and cognitive mechanisms, and that coping is related to perceived changes in both the amount and type of outdoor recreation. High levels of coping as found in this study may be stressful at the individual level, may lead to diminished diversity of outdoor recreation opportunities at the societal level, and suggests that overall "satisfaction" may be a superficial and even misleading measure of quality in outdoor recreation.

KEYWORDS: Coping, displacement, crowding, conflict, Acadia National Park

Introduction

Crowding and conflict are among the most fundamental and intensively studied issues in outdoor recreation. As the number and diversity of visitors to parks and outdoor recreation areas has risen over the past several decades, so has concern over the potential effects of these trends on the quality of outdoor recreation experiences. Research on crowding and conflict suggests the complex nature of these topics. In particular, empirical research has often found that visitor satisfaction may remain relatively high even when use levels of a park or related area increase (see, for example, Manning 1999, Table 5-3). A possible explanation of these findings suggests that some recreationists may adopt one of several coping mechanisms in response to crowding and/or conflict. For example, if some visitors "cope" with crowding and conflict through the process of "displacement" (e.g., they don't go to that park as often, or stop going altogether), then those visitors may not be present to register their dissatisfaction. Moreover, such visitors may ultimately be replaced (or "displaced") by visitors who are not as sensitive to increased use levels. In this way, use levels may continue to increase, and visitor satisfaction (at least as it is commonly measured through on-site surveys) may continue to be high.

Coping is a widely used concept in psychology and is generally defined as "any behavior, whether deliberate or not, that reduces stress and enables a person to deal with a situation without excessive stress" (Sutherland 1996). A number of coping mechanisms have been identified in the general crowding literature (Altman 1975). The classic work of Milgram (1970), for instance, has illustrated the ways in which urban residents cope with excessive population density-brusque conversations, unlisted telephones, and disregard of strangers, even when they may be in need. The literature on outdoor recreation has identified a number of coping mechanisms that might be used by recreationists to deal with crowding and conflict, including shifting use to other locations and/or times and redefining appropriate outdoor recreation experiences.

The purpose of this paper is to further explore the use of coping mechanisms in outdoor recreation. More specifically, the objectives of the study are to 1) measure perceived changes in the amount and type of recreation use that has occurred at a major national park, 2) measure the extent to which a variety of

coping mechanisms have been adopted by visitors to that national park and 3) analyze the relationships among perceived changes in recreation use and adoption of selected coping mechanisms to explore how perceived changes in the amount and type of recreation use may influence the adoption of selected coping mechanisms. The study focuses on the carriage roads of Acadia National Park, a system of multiple use trails, and is applied to residents of communities in and around the park.

Coping in Outdoor Recreation

The literature on coping in outdoor recreation suggests that outdoor recreationists may utilize three primary coping mechanisms: displacement, rationalization, and product shift (see Manning 1999, Chapter 5 for a review and synthesis of the literature on coping in outdoor recreation). While most conceptual and empirical studies have focused attention on coping mechanisms within the context of crowding, recent research has suggested that recreation visitors may also adopt coping strategies to deal with problems of conflict (Schneider and Hammitt 1995). Displacement is a behavioral coping mechanism in that it involves spatial or temporal changes in use patterns in response to crowding or conflict. Rationalization and product shift are cognitive coping mechanisms involving changes in the ways visitors think about recreation experiences and opportunities.

Displacement

A number of studies have suggested that as use levels increase, some recreationists may become dissatisfied and alter their patterns of recreation activity to avoid crowding, perhaps ultimately moving on to less used areas (see, for example, Anderson and Brown 1984; Shelby et al. 1988; Hammitt and Patterson 1991; Robertson and Regula 1994). In this manner, they are "displaced" by recreationists more tolerant of higher use levels. This suggests that the reason for a lack of relationship between use levels and satisfaction is that people who are sensitive to existing use levels at each recreation site have been displaced from these sites. It is important to note that displacement does not have to involve a shift from one recreation area to another-- intersite displacement--but can involve shifts within a recreation area intrasite displacement--and shifts from one time period to another-- temporal displacement. The concept of displacement was suggested as early as 1971 when it was described as a process of "invasion and succession" (Clark et al. 1971).

Several studies have addressed this hypothesis empirically. Some have focused on changes in behavior directly associated with use level. Rafters on the Colorado River in Grand Canyon National Park, AZ, for instance, were found to have changed their trip plans as a function of river use level (Nielson and Shelby 1977). Changes included limiting the number of attraction sites visited and the time spent at each, both actions designed to limit contact with other rafting parties. Similarly, hikers in two wilderness areas reported changing the length and/or route of their trip because of use levels encountered: 25% in the Spanish Peaks Primitive Area, MT, and 44% in the more heavily used Desolation Wilderness Area, CA (Stankey 1980).

A slightly different methodology was applied in a study of visitors to the Boundary Waters Canoe Area, MN, and indications of displacement were again found (Anderson 1980, 1983, Anderson and Brown 1984). Visitors who had made more than four trips to the area were studied to determine changes in trip patterns over time. The vast majority of respondents were found to have changed their pattern of use by selecting different entry points or campsites, or by entering on a different day of the week. Factors related to trip changes included use level, litter, noise, and environmental impacts.

Only one study of displacement has used a panel approach, a more rigorous longitudinal methodology (Kuentzel and Heberlein 1992). This study surveyed the same group of boaters at the Apostle Islands

National Lakeshore, WI, at a ten-year interval-1975 and 1985. Findings supported intrasite displacement behavior (respondents who had shifted to lower-use portions of the area tended to report higher levels of perceived crowding in 1975), but found no evidence of intersite displacement. Several other studies have addressed displacement using a variety of research approaches applied to a diversity of recreation areas (Nielson and Endo 1977; Wohlwill and Heft 1977; Vaske et al. 1980; Becker 1981; Becker et al. 1981; West 1981; Hammitt and Hughes 1984; Shelby et al. 1988; Hammitt and Patterson 1991; Robertson and Regula 1994). Most of these studies have found evidence of some degree of intersite or intrasite spatial displacement and/or temporal displacement related to crowding or conflict.

Rationalization

A second coping behavior suggested in outdoor recreation involves a process of rationalization. Since recreation activities are voluntarily selected and sometimes involve a substantial investment of time, money, and effort, some people may rationalize their experience and report high levels of satisfaction, regardless of conditions. This hypothesis is rooted in the theory of cognitive dissonance developed by Festinger (1957) and others, and suggests that people tend to order their thoughts in ways that reduce inconsistencies and associated stress. Therefore, to reduce internal conflict, people may be inclined to rate their recreation experience highly regardless of actual conditions. This, then, may explain why reported satisfaction is often not related to use levels.

This hypothesis appears reasonable when applied, as it originally was, to rafters on the Colorado River in Grand Canyon National Park, AZ (Heberlein and Shelby 1977). For most people, this trip is a substantial undertaking: trips are long, normally requiring at least a week; commercial passengers pay high fees; and private trips may have to wait years to receive a permit. Under these conditions, many people might refuse to be easily disappointed. The hypothesis loses some of its appeal, however, when applied to less extraordinary circumstances. Little support for this hypothesis, for example, was found in a study of river use in Vermont (Manning and Ciali 1980). Most visitors were in-state day users. With such a relatively small investment in their trip, it seems more likely that they would have reported they had had an unsatisfactory experience because of crowding or for any other reason. Indeed, many respondents were not hesitant to express dissatisfaction, with reported satisfaction ratings ranging throughout the response scale.

Product Shift

The third coping mechanism suggested in outdoor recreation involves the cognitive behavior of product shift (Heberlein and Shelby 1977, Stankey and McCool 1984, Shelby and Heberlein 1986, Stankey 1989, Hendee et al. 1990). This hypothesis suggests that visitors who experience higher use levels than are expected or preferred may alter their definition of the recreation opportunity in congruence with the condition experienced.

Several studies have addressed this issue empirically. Studies of users of the Rogue River, OR, suggest that product shift is a relatively common coping strategy (Shelby et al. 1988). When users were asked how they would react to encountering more visitors on the river than expected, 34% responded that they would change the way they thought about the river, deciding it was less remote than initially believed. A follow-up survey conducted seven years later compared these two samples with respect to the type of recreation opportunity provided by the river. Over this time period, the river experienced a 45% increase in use. In the initial survey, 20% of respondents reported that the river provided a "wilderness" experience, 66% a "semi-wilderness" experience, and 14% an "undeveloped recreation" experience. In the followup survey, these percentages had changed to 4, 59, and 37 respectively, suggesting substantial product shift.

A study of visitors to Aravaipa Canyon Wilderness, AZ, is also suggestive of product shift (Moore et al. 1990). The number of visitors encountered was related to perceptual definitions of the area. Respondents who encountered larger numbers of visitors reported a lessened sense of solitude, and also reported lessened feelings of freedom, that no one had been there before, and of unspoiled wilderness. In other words, higher use levels led to broader judgments of the study area as something less than pristine wilderness.

Two panel studies have addressed the issue of product shift. The first was focused again on the Rogue River, OR (Shindler and Shelby 1995). Surveys of the same river users were conducted fourteen years apart, a period in which river use increased 70%. In the initial survey, 25% of respondents reported that the river provided a "wilderness" experience. However, this declined to 8% in the follow-up survey, suggesting substantial product shift. However, the second panel study, the study of boaters at Apostle Islands National Lakeshore, WI, described above, found no evidence of product shift (Kuentzel and Heberlein 1992).

The Study

The study reported in this paper was conducted on the carriage roads of Acadia National Park, Maine. The carriage roads are a system of approximately 50 miles of trails within the park that are used for hiking, biking, and equestrian activities. Originally designed for horses and carriages in the first half of the twentieth century, the carriage roads have become increasingly popular for hiking and, more recently, for mountain biking.

The study was applied to residents of the four communities in and around the park. Local residents may comprise an especially interesting population for a study of coping in outdoor recreation because they are likely to use their local park often for recreation and they are likely to have used the park over a relatively long period of time. In fact, the study found that nearly all respondents (93.1%) had used the carriage roads, that most residents have used the carriage roads for nearly 20 years, and that current users use the carriage roads about ten times per year.

Community residents were studied by means of a mail survey. A systematic random sample of 939 community residents, stratified by the four towns in and around the park, was developed from telephone directories. The survey was conducted in the summer of 1996 using procedures recommended by Dillman (1978). An initial mailing consisted of a questionnaire and cover letter explaining the study. The back cover of the questionnaire was pre-addressed and postage was prepaid. A week after the initial mailing, a postcard reminder was sent to all members of the sample. A second questionnaire and cover letter was sent to nonrespondents three weeks after the initial mailing. One hundred and seventy-eight questionnaires were undeliverable. Three hundred and seventy-seven completed questionnaires were returned, yielding a response rate of 49.5%.

Two batteries of questions dealt specifically with coping and related matters. The first battery of questions was designed to measure perceived changes in the amount and type of visitor use on the carriage roads over time. Respondents were presented with a series of statements describing possible changes in recreation use of the carriage roads, and respondents were asked to indicate the degree to which they agreed or disagreed with each statement. These statements dealt with the overall use level on the carriage roads, the use levels of selected recreation activities, and levels of selected "problem behaviors" on the carriage roads. The possible changes in carriage road use addressed in these statements were developed from a series of open and close-ended questions administered in a previous phase of research on the carriage roads (Manning et al. 1996). Statements are shown in Table 1. The second battery of questions was designed to measure coping mechanisms adopted in response to perceived changes in carriage road

use. Respondents were asked if and how their "use of the carriage roads has changed over the past several years". The items contained in this battery of questions included a variety of potential coping mechanisms designed to test for spatial and temporal displacement, rationalization, and product shift. These coping mechanisms, and statements designed to measure them, were adapted from previous studies of coping in outdoor recreation, including Hammitt and Patterson (1991) and Robertson and Regula (1994). Statements are shown in Table 2.

Analysis of study data was conducted on both descriptive and analytical levels. Descriptive findings from the two batteries of questions indicate perceived changes in the amount and type of carriage road use, and the level and type of coping mechanisms adopted by respondents. These two data sets were then related using linear and logistic regression analysis to determine the extent to which adoption of coping mechanisms is statistically related to perceived changes in carriage road use.

Study Findings

Study findings are presented in three sections corresponding to the three study objectives. The first two sections outline descriptive findings to the two batteries of questions described above. The final section describes findings from a series of analyses designed to explore the relationships between findings from these two batteries of questions, or the degree to which selected types of perceived changes in carriage road use (e.g., overall use level, use level of certain types of recreation activities, or incidences of certain types of problem behaviors) are statistically related to adoption of selected types of coping mechanisms (e.g., displacement, rationalization, or product shift).

Perceived Changes in Carriage Road Use

Responses to the first battery of questions are shown in Table 1. It is clear from these findings that most respondents believe that most recreation activities and problem behaviors have increased "over the past several years". This applies to the overall number of people using the carriage roads (Item A) (96.6% agree or strongly agree); the number of people participating in biking (Item C) (96.8% agree or strongly agree), walking/hiking (Item B) (88.9% agree or strongly agree), and running (Item D) (76.9% agree or strongly agree); and the number of incidences of three problem behaviors, including the number of bicycles startling you by passing from behind without warning (Item F) (75.6% agreed or strongly agreed), the number of bicycles traveling at excessive speed (Item G) (72% agreed or strongly agreed), and the number of people obstructing or blocking the carriage roads (Item I) (61.7% agreed or strongly agreed). Only a minority of respondents agreed (38.5% agreed or strongly agreed) that the number of horses/carriages using the carriage roads has increased (Item E) or that the number of incidences of dogs off leash has increased (Item H) (49.8% agreed or strongly agreed).

Adoption of Coping Mechanism

Responses to the second battery of questions are shown in Table 2. These data are more complex. Responses to statements A through D paint a broad picture of how the study population has generally responded to changes in carriage road use. Most respondents (59.6%) reported that their use of the carriage roads "has not changed much over the years" (Item A). A substantial minority (31.1%) reported that they use the carriage roads "more now than [they] used to" (Item B). A smaller minority (25.0%) reported that they use the carriage roads "less often than [they] used to because of changes in use that have occurred on them" (Item C). Only a small minority (7.4%) reported that they "no longer use the carriage roads because [they] don't like the changes in use that have occurred on them" (Item D). At an individual level, only a very small percentage of community residents have adopted this most extreme coping mechanism of intersite displacement. Most community residents have continued to use the

carriage roads at about the same level they have in the past, while nearly a third have increased their use, and a quarter have decreased their use. Given these findings, residential use of the carriage roads at an aggregate level has probably not changed much over time². However, the composition of residential users may be changing incrementally.

Responses to statements C through H describe use of the coping mechanism of displacement. As suggested in the literature reviewed earlier in this paper, displacement can take many forms, including temporal and spatial. Substantial percentages of respondents—nearly half or more—reported adopting both temporal and/or spatial displacement behaviors. Temporal displacement behaviors included shifting use to the off-season (64.6%) (Item E), shifting use to weekdays (44.8%) (Item F), and shifting use to earlier and/or later hours of the day (41.5%) (Item G). Spatial displacement behaviors included shifting use to other sections of the carriage roads (46.0%) (Item H), no longer using the carriage roads (7.4%) (Item D), and using the carriage roads less often (25.0%) (Item C).

Responses to statements I and J describe use of the cognitive coping mechanisms of product shift and rationalization. Nearly half of respondents (49.8%) engage the mechanism of product shift in that their use of the carriage roads has not changed much over the years, but they believe the type of experience provided by the carriage roads has changed (Item I). Findings regarding rationalization are not as clear. Over a third of respondents (35.4%) reported that their use of the carriage roads has not changed much, but they are not as satisfied with their experiences (Item J). This compares with 59.6% of respondents who reported that their use of the carriage roads has not changed much over the years (as reported above) (Item A). The latter group minus the former group leaves 24.2% of the sample that could be hypothesized as adopting the cognitive coping mechanism of rationalization. That is, these respondents continue to use the carriage roads as in the past, but report being just as satisfied despite increasing levels and diversity of use. Another and perhaps more technically accurate way to calculate this subsample is to find all respondents who answered "Yes" to item A and "No" to item J. This procedure yielded a subsample of 112 respondents, or 29.7% of the sample. These estimates regarding rationalization are clearly conjectural, and may more accurately represent the upper bounds of the percentage of respondents using rationalization. It is certainly possible that the satisfaction of some respondents is truly unaffected—possibly even increased—by perceived increases in levels and diversity of carriage road use.

Another way to examine these data is the cumulative number of coping mechanisms used by respondents, as shown in Table 3. These data show that use of coping mechanisms is pervasive across the sample—only 6% of respondents did not use any of the coping mechanisms included in the study. Many respondents used more than one coping mechanism, up to a maximum of seven.

Relating Perceived Changes to Adoption of Coping Mechanism

To explore relationships among perceived changes in carriage road use and adoption of coping mechanisms, a series of linear and logistic regressions were computed as shown in Table 4. The first regression analysis explored perceived changes in carriage road use and an overall, cumulative (additive) index of seven of the eight coping mechanisms (items GI in Table 2). (The measure of the cognitive coping mechanism of rationalization was not included in this overall index because of the uncertainties surrounding measurement of this variable.) Responses to the seven coping mechanism questionnaire items were coded so that the higher the index score, the more coping mechanisms adopted by respondents. The resulting linear regression equation was statistically significant and perceived changes in carriage road use explained 27% of the variation in adoption of coping mechanisms. Three perceived changes in carriage road use entered the equation. The perceived number of bicyclists traveling at excessive speeds was most strongly and positively related to adoption of coping mechanisms ($B = 0.79$): the more this change in carriage road use was perceived, the more likely respondents were to adopt

coping mechanisms³. Other perceived changes in carriage road use positively related to adoption of coping mechanisms were increasing number of people using the carriage roads ($B = .32$) and increasing number of people obstructing or blocking the carriage roads ($B = .46$).

Remaining analyses examined the relationships among perceived changes in carriage road use and adoption of selected subsets of coping mechanisms: overall displacement behaviors (items GH), temporal displacement behaviors (items E-G), spatial displacement behaviors (items C, D and H), the cognitive coping mechanisms of product shift (item I) and rationalization (item J). Linear regression was used with analysis of all displacement behaviors because they contained multiple-item dependent variables, and logistic regression was used with both cognitive coping mechanisms because they used single-item dependent variables.

Results from these additional analyses were generally consistent with the findings described above. Perceived changes in carriage road use explained between 16% and 23% of the variance in adoption of the three subsets of displacement behaviors. Perceived changes in carriage road use allowed correct prediction of whether or not respondents adopted the two cognitive coping mechanisms in 68% to 72% of the cases. For the three subsets of displacement behaviors, perceived increases in problem behaviors (specifically, bicycles traveling at excessive speeds and people obstructing or blocking the carriage roads) were more powerful predictors of adoption of displacement behaviors than were increases in use level. However, for the two cognitive coping mechanisms, perceived increases in either the number of people using the carriage roads or the number of people participating in selected recreation activities were as important or more important in predicting adoption of these coping mechanisms as were selected problem behaviors.

Conclusions and Implications

Study findings suggest that coping mechanisms are widely used by the study population. Adoption of the eight individual coping mechanisms studied ranged from about 24% to nearly 65% of the sample. Even more impressively, 94% of respondents use at least one coping mechanism to avoid or otherwise reconcile perceived undesirable changes in use that have occurred on the carriage roads. These findings, together with previous research, suggest that coping may be pervasive in outdoor recreation.

Study findings also generally corroborate previous research by suggesting that recreationists employ a variety of coping mechanisms. Respondents reported using both behavioral and cognitive coping mechanisms, employ at least two and perhaps all three types of coping mechanisms hypothesized in the literature—displacement, product shift, and rationalization—and utilize both spatial and temporal displacement strategies. Coping is not a monolithic response to changing recreation conditions, and is clearly more complex than intersite displacement as initially conceived and described as the phenomenon of "invasion and succession."

Is coping a "productive" response to perceived changes in outdoor recreation? And how much coping is "too much"? Study findings cannot definitively answer these and related questions. However, they may be suggestive. At the level of the individual, coping can be a normal, healthy response to adverse stimuli. A need for extreme levels of coping, however, may indicate important problems in outdoor recreation, and may not be in the best interest of either the individual or society at large. For example, the coping mechanisms of some crowded, urban populations identified by Milgram (1970), described earlier in this paper, may represent levels and types of coping that are unhealthy and ultimately dysfunctional. In the context of outdoor recreation, too much coping may be excessively stressful at the individual level. The 7.4% of the sample that reported intersite displacement from the carriage roads represents an extreme response: these local residents report no longer using this significant recreation resource that is an

important part of the national park in their "backyard", and this change in use of the carriage roads is attributed by respondents to the fact that they "don't like the changes in use that have occurred on them."

Study findings may be more troubling at a societal level. The degree of coping reported in this study (and other, related studies) may result in diminished diversity of outdoor recreation opportunities. As visitors sensitive to crowding and conflict adjust their behavior and thinking, recreation opportunities characterized by relatively low use levels and relatively low potential for conflict become more scarce. Low density recreation opportunities characterized by relatively similar recreation activities are not inherently "better" than high density, more diverse opportunities. However, a very large percentage (94%) of respondents in this study are taking behavioral and cognitive action to seek the former and avoid the latter. This suggests that it may be wise for park managers to deliberately design and maintain recreation opportunities on the carriage roads, and elsewhere, that serve the needs of a variety of visitors. Ironically, the displacement-related coping mechanisms used by such large percentages of the sample population may, in fact, be exacerbating the situation. As displaced carriage road visitors shift their use to previously low-use times and places, these times and places are no longer as "low-use". In this way, changes in recreation use patterns and experiences can "ripple through" the societal spectrum of recreation opportunities, systematically reducing opportunities for selected types of recreation experiences.

Study findings illustrate the potential for multiple causes for adoption of coping mechanisms, including increasing total use, increasing diversity of recreation activities, and increasing incidences of problem behaviors. All three of these types of changes in carriage road use were statistically significant predictors of behavioral and cognitive coping mechanisms, although their importance varied by type of coping mechanism adopted. This suggests that, when warranted, the need for adoption of coping mechanisms can be minimized by managing any or all of these causative factors.

This research represents the first coping-related study focusing on people who live in or around a park or outdoor recreation area. Do local residents differ from other, more traditional visitors? Local residents may find it easier than other visitors to adopt temporal and intrasite displacement mechanisms because they are probably more knowledgeable about the park and have more opportunities to shift their temporal use patterns. Therefore, the relatively high rate of adoption of these coping mechanisms among the study population may not be representative of other, more traditional visitors. However, because of the high potential for "place attachment" between local residents and their "hometown" park, adoption of intersite displacement as a coping mechanism may be a relatively extreme response among this group, and therefore underestimated in this study compared to other, more traditional visitors. Despite these potential differences between resident and non-resident visitors, findings from this study generally corroborate previous research and the substantive level of coping in outdoor recreation. The relatively high level of coping found in this study suggests the importance of involving local populations, as well as other interest groups, in outdoor recreation planning, management, and research.

This and other coping-related research suggests the inherent complexity of managing and monitoring outdoor recreation. Measures of overall visitor "satisfaction" may be too simplistic to adequately evaluate management of outdoor recreation. To the extent to which recreation visitors adopt behavioral and cognitive mechanisms to cope with undesirable changes in recreation use and users, "satisfaction" may be a superficial and even misleading measure of quality in outdoor recreation. Even though visitor surveys may find high levels of visitor satisfaction, park use and users may be changing in important and potentially undesirable ways. At the level of the individual, behavioral and cognitive coping mechanisms represent stressful adaptations to perceived undesirable changes in outdoor recreation. At the level of society, adoption of coping mechanisms may indicate incremental and unintended changes in the spectrum of outdoor recreation opportunities. This issue is magnified by the fact that this and other studies suggest that coping mechanisms in outdoor recreation may be pervasive.

As with any study, there may be methodological and substantive limitations associated with this study. The response rate of approximately 50% raises the issue of a potential for non-response bias. Are non-respondents different from respondents in their perceptions and use of the carriage roads? Unfortunately the study budget did not allow for a follow-up study of non-respondents. A second source of potential bias concerns the sampling frame, which was derived from telephone directories, and thus excluded community residents without telephone service or with unlisted telephones. Finally, from a methodological standpoint, the battery of questions measuring adoption of coping mechanisms might have employed a "decision-tree" format rather than asking all respondents whether or not they had adopted all of the coping mechanisms. This may have improved question clarity and precision of study data.

From a more substantive standpoint, measures of the coping mechanism of rationalization used in this study are largely conjectural. Clearly, additional research is needed to more fully understand and more accurately measure this potential coping mechanism. Moreover, coping in outdoor recreation may be related to changes in the recreation environment other than issues of crowding and conflict addressed in this study, and other such factors should be investigated in future research. Finally, study findings raise the issue of potential relationships between the coping mechanism of displacement and the concept of "substitutability" in outdoor recreation. A number of studies have explored the degree to which recreationists might be able to satisfactorily substitute activities, places, or time periods (e.g., Iso-Ahola 1986; Vaske et al. 1990; Shelby and Vaske 1991; Manning 1999, Chapter 10). Displacement might be considered a subset of substitutability, in that displacement-related changes in recreation activities, places or times are, by definition, caused by adverse stimuli and not voluntarily chosen. However, future research might explore potential connections between these two areas of recreation research.

1Recreationists may adopt coping strategies in response to other stresses, such as user fees (Schneider and Budruk 1999), but the scope of this paper is limited to crowding and conflict related coping.

2The number of respondents answering affirmatively to the four questions described above totals to more than 100%. However, these questions are not mutually exclusive. For example, a respondent who no longer uses the carriage roads could have reported "Yes" to both items C and D. Consequently, aggregate findings from these four questions paint only a broad or rough picture of changes in carriage road use by the sample population.

3B is the least squares estimate of slope of the regression line, also known as the non-standardized regression coefficient in linear regression. B indicates the amount of change in a given dependent variable with a change of one unit in the independent variable, while holding all other independent variables in the regression model constant. In logistic regression, B is interpreted as the change in the dependent variable associated with a one-unit change in the independent variable. The change however is not a linear function of the independent variables. The slope of the curve varies, depending on the value of the independent variable.

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Robert E. Manning and William A. Valliere

School of Natural Resources, University of Vermont

Address correspondence to: Robert E. Manning, Professor, School of Natural Resources, 356 George D. Aiken Center, University of Vermont, Burlington, VT 05405, Phone: (802) 656-3096, Fax: (802) 656-8683, Email: rmanning@nature.snr.uvm.edu

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