

Using leisure constraints research to inform outdoor recreation research and natural resource management decisions

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Introduction

MANY PROTECTED AREAS, PARTICULARLY IN THE UNITED STATES, are charged not only with protecting natural resources but also with providing recreation opportunities. In this paper, we explore the importance of outdoor recreation to American cultural heritage as well as to individual recreationists. We then explore the field of leisure constraints research and advocate for its integration with the field of outdoor recreation research. We feel that the integration of these two fields will enrich the current knowledge and research of each. We also believe that by applying the field of leisure constraints research to land management issues, managers will be newly exposed to valuable tools to help them reach their goal of concomitantly providing high-quality recreation opportunities along with natural resource protection.

Historic and contemporary outdoor recreation participation in America

Historically, outdoor recreation participation began to show prominence in the United States as a manifestation of national pride. In particular, outdoor recreation began around the time of the Industrial Revolution and the inception of the Appalachian Mountain Club (1876), Theodore Roosevelt's Boone and Crockett Club (1888), and the Boy Scout movement (1907). These historical events occurred out of response to the discontent with civilization and the interest in wilderness as a source of national pride (Nash 1967 [1982]).

Contemporary outdoor recreation participation has grown substantially since the Industrial Era, and continues to gain popularity in recent decades (Cordell et al. 2002). An examination of outdoor recreation participation using federal data collected from the National Survey on Recreation and Environment (NSRE) of fall 2001, revealed 97% of respondents participated in at least one outdoor recreation activity over the last 12 months. Walking has consistently remained the most popular activity (83.8% participation) followed by attending a gathering outdoors with family or friends (73.5%), visiting nature centers, nature trails, visitor centers and zoos (57.2%), picnicking (55.3%), and viewing or photographing natural scenery (54.0%). The fastest growing outdoor recreation activities for people 16 years of age and older included bird watching with a growth rate of 236% since 1983, followed by hiking (196%), backpacking (165.9%), snowmobiling (107.5%), walking (91.2%), off-road driving (89.2%), primitive camping (81.9%), developed camping (76.0%), downhill skiing (66.9%), and swimming in natural waters (64%) (Cordell et al. 2002). These growth rates provide telling evidence of the clear rise in outdoor recreation occurring in protected area settings across the country.

Importance of outdoor recreation to recreationists

Recreation has, and continues to, play an important role for people historically and in present-day, with many recognized benefits of participation. In particular, recreation and leisure participation are widely recognized as providing opportunities for individuals to attain their goals (Ajzen 1991) and achieve self-actualization (Csikszentmihalyi 1990 [1991]). Additionally, individuals participate with the expectation of psychological, educational, social, relaxational, physiological, or aesthetic satisfaction (Beard and Ragheb 1980),

Engaging in recreation in outdoor settings provides similar benefits as natural resources maintain the capacity to contribute to quality of life (Marans and Mohai 1991). For some, participation in outdoor recreation is tonic for the soul, while for others it is a generational practice, a skill or hobby passed down through family tradition to create a recreation genealogy (Hammitt et al. 2006). These experiences in natural leisure spaces translate into formations of affective bonds between people and place, as well as responsible environmental attitudes, behaviors, values, and concern.

These experiences provide improved quality of life through psychological development, which includes the development of resiliency. In particular, resiliency is

known to foster coping and adapting behaviors for situations of everyday life. Past research on outdoor recreation participation and psychological development reveals outdoor recreation supports the development of psychological resiliency and coping strategies. For instance, in a study of short-term adventure-based recreation expeditions, Ewert and Yoshino (2008) found these experiences had some effect on personal resilience. In particular, significant differences were reported between pre- and post-test results for the following resiliency statements: “I feel proud that I have accomplished things in my life,” “I can usually find something to laugh about,” “I have enough energy to do what I have to do,” “I can deal with whatever comes in the future,” and “I actively look for ways to replace the losses I encounter in life.” A study on a substance abuse prevention and intervention program found similar results; recreation participation fostered the development of coping skills (King et al. 1998). An examination of outdoor adventure education and psychological development revealed outdoor adventure curriculum had an effect on hardiness, as respondents described an increased ability to successfully manage stressful situations by turning them into positive opportunities, rather than as debilitating problems (Sheard and Golby 2006). These findings support the importance of outdoor recreation participation in psychological growth by fostering the development of coping strategies for daily life and the importance of recreation to overall personal well-being.

Introduction to leisure constraints research

Clearly outdoor recreation is very beneficial to participants and positively influences various facets of their lives. Therefore, it is important for scientists and land managers to gain an awareness and understanding of situations and factors that can act as a barrier or constraint to recreation. The field of leisure constraints research offers such an understanding.

According to Jackson (1991), the goal of leisure constraints research is to “investigate and understand the factors that are assumed by researchers and perceived by individuals to inhibit or prohibit participation and enjoyment in leisure.” Early work in the field of leisure constraints focused exclusively on “structural” or “intervening” constraints, those constraints which impact leisure participation after a leisure preference has been established, with the assumption that these were the only leisure constraints that existed (Shaw et al. 1991; Jackson 1994; Jackson 2005). Structural constraints tend to be external to the leisure participant and include examples such as lack of money or free time, or seasonal weather patterns.

This trend of focusing only on structural constraints changed in the late 1980s with a major shift in focus brought on by Crawford and Godbey’s suggestion of two additional categories of leisure constraints: intrapersonal (individualized factors that influence leisure preferences directly), and interpersonal (social factors that influence both preference and participation simultaneously) (Crawford and Godbey 1987; Jackson 1988). Examples of intrapersonal constraints include stress, depression, or anxiety while examples of interpersonal constraints include not having a partner with whom to engage in the activity.

The field of leisure constraints research continued to evolve into the 1990s with the suggestion that a hierarchical model of constraints exists where participation in recreation or leisure is dependant on an individual’s ability to negotiate through each level of constraint. This hierarchy places intrapersonal constraints on the first level, with interpersonal constraints encountered at the second level, and structural constraints encountered on the third level only after the first two levels of constraints have been successfully negotiated (Crawford et al. 1991). Implicit in this hierarchy is the supposition that intrapersonal constraints are the most important because they are nearest to the leisure participant and are thus encountered more frequently than other types of constraints; additionally, structural constraints are presumed to be least important because they are furthest in the hierarchy and only encountered after the other two categories have been surpassed (Crawford et al. 1991).

Likely as a result of these changes in the theoretical development of the leisure constraints field, much subsequent research has moved away from the structural category of constraints, focusing instead on issues within the intrapersonal and interpersonal categories such as gender, race, culture, and age (Johnson et al. 2001; Shaw and Henderson 2005; Shinew and Floyd 2005; McGuire and Norman 2005; Chick and Dong 2005). This has kept the field within the realm of the social sciences and invited overlap between it and other fields such as sociology, psychology, and anthropology. However, there has been very little overlap between leisure constraints research and the field of outdoor recreation research; based on the conceptual characteristics of each, it is clear the two fields would benefit from some level of interaction (Walker and Virden 2005). In fact, it is clear that the field of leisure constraints research can provide beneficial information not only to recreation researchers, but also to protected area managers to assist them in decision-making (Walker and Virden 2005). Leisure constraints research results can be directly applied in recreation management strategies (Jackson 1988) and to improve the quality of participation (Boothby et al. 1981).

Linking the two fields

In order to link the two fields of outdoor recreation research and leisure constraints research, one must explore the specific points at which the two intersect, while keeping in mind the theoretical development that has been previously established.

Walker and Virden (2005) suggest expanding the category of structural constraints in the context of outdoor recreation to include four new divisions within structural constraints: social environment structural constraints (social environment conditions such as crowding that limit participation), territorial structural constraints (issues of accessibility that limit participation), institutional structural constraints (agency or management-enforced constraints that limit participation), and natural environment structural constraints (natural environment setting conditions that limit participation).

In this paper, we will focus on exploring two specific types of natural environment structural constraints. The first is a situation where the protected area's natural resources act as a constraint to recreation. The second is a situation where recreational impacts to natural resources act as a constraint to recreation.

Natural resources as a constraint to recreation

Walker and Virden (2005) suggest some examples of situations where natural resources can constrain recreation. Examples include inclement weather, undesirable climate, or rugged topography. Additionally, the presence of certain wildlife species such as bears or wolves can be considered a natural environment structural constraint if a recreationist perceives the wildlife to be dangerous and limits his/her participation accordingly.

A specific example that will be explored in depth here is that of *Escherichia coli* at Indiana Dunes State Park (IDSP), on the southern shore of Lake Michigan. Swimming in Lake Michigan is a very popular recreation activity at IDSP, with an estimated 810 average swimmers per day in the summer (Rabinovici et al. 2004). It is well known that the waters at IDSP beach sometimes contain elevated levels of *E. coli* and multiple studies have been conducted to ascertain the source and ubiquity of this *E. coli* in the waterways of the area. Studies suggest that *E. coli* is ubiquitous in forest soils and sediments of riparian areas near southern Lake Michigan and may naturally occur in the environment (Byappanahalli et al. 2003; Whitman et al. 2006). These findings indicate that increased levels of *E. coli* in Lake Michigan are caused by nonpoint and, most likely, nonfecal sources. Rather, *E. coli* loadings in nearby streams are increased through soil erosion, a phenomenon that has been exacerbated by human activity such as wetland ditching which has altered drainage patterns (Byappanahalli et al. 2003).

Current management practice at IDSP consists of sampling the water at the beach once per week, implementing swim closures if the *E. coli* density is above the EPA's standard of 235 *E. coli* cfu/100 mL and following up with daily samples until the *E. coli* density falls below the standard (Rabinovici et al. 2004). Rabinovici et al. (2004) conducted a study of the swim closures at IDSP during the years 1998-2001 and found an average of over five closures per year, most lasting only one day. When placed in the context of the economic value recreationists place on swimming, this level of recreation impact causes a net economic loss of up to \$35,000 per day for IDSP visitors that wish to swim at the park but are precluded from doing so (Rabinovici et al. 2004).

This situation presents a very clear example of a natural environment structural constraint. Recreationists at IDSP are losing at least five swimming days per year—a loss that is directly caused by *E. coli*, a bacterium that is naturally occurring in the environment. However, depending on the recreationist, this impact could become an intrapersonal constraint as well as a structural constraint if their experience with swim closures at IDSP changes their attitude toward swimming at IDSP and beaches in general. This is a potential feedback loop that has been identified by leisure constraints researchers (Crawford et al. 1987; Crawford et al. 1991) who assert that constraints can directly influence preferences. In this situation, an individual's beliefs or attitudes about the probability of encountering a certain structural constraint influences their future decisions to participate in the activity. Jackson et al. (1993) describe this phenomenon when they point out that in some cases an individual's desire to participate in a certain activity can be quashed by the mere expectation of encountering an insurmountable constraint to the activity. For a structural constraint such as *E. coli*, this situation could be particularly likely because of the health risks posed by *E. coli* exposure; therefore, any resulting negative connotations regarding swimming at beaches could be difficult to erase.

Recreation impact to natural resources as a constraint to recreation

A second example of a situation in which natural resources constrain recreation involves recreation impact to the resource subsequently affecting recreationists' attitudes toward those impacts and management's actions resulting from those impacts. It is well established that recreation activities can impact natural resources including vegetation, soils, and wildlife (Hammit and Cole 1987; Knight and Gutzwiller 1995). When one considers this natural resource and protected area impact in the context of the leisure constraints framework, it is compelling to contemplate if there might be situations in which the impact caused by recreation functions as a type of natural environment structural constraint.

For example, when trail use causes erosion, that erosion becomes part of the natural environment of the area. It is plausible that erosion could cause trail users to limit their own use of the area, as a result of their feelings for the area and their desire not to contribute to further environmental degradation there. In this case, it would be a situation in which a natural environment structural constraint (the existence of the erosion) has shifted into the realm of an intrapersonal constraint, where it is an internal decision on the part of the trail user to limit his or her own use of the area (another example of the afore-mentioned feedback loop). As pointed out by Walker and Virden (2005) such a situation may exist if a person feels a certain attachment to a place which then causes "pro environmental behaviors" toward that place. There is evidence to suggest this is the case in some instances. A study by Walker and Chapman (2003) suggests that outdoor recreationists are inclined to reduce their frequency of visitation to, or stop visiting altogether, a favored place if doing so would decrease environmental impact to that place. Additionally, there is evidence to suggest that outdoor recreationists support management regulatory measures to limit use in areas that have been impacted by use. Shindler and Shelby (1993) found that a majority of outdoor user groups surveyed supported regulatory

measures such as closing campsites for recovery and limiting the number of users in highly impacted sites.

Regulatory restrictions on trail use include such actions as closing a site to trail use or limiting the number of trail users allowed and are often a direct response to environmental degradation of the site caused by recreation. Since environmental degradation, such as erosion, is part of the natural environment, this would be a situation that begins as a natural environment structural constraint, similar to the previous example. However, in this instance, the limits to recreation at the site are not self-imposed, rather they are imposed by a land management agency and would fit into the category of institutional structural constraints suggested by Walker and Virden (2005). In some instances, this type of institutional structural constraint can then lead to a recreationist changing his or her attitudes toward recreating at this particular park. A recreationist may feel that they prefer a place with more freedom and fewer use restrictions, leading them to shift their use to a different park. This would effectively constitute an intrapersonal constraint, once again exemplifying the afore-mentioned leisure constraints feedback loop.

Implications for resource managers

Since availability of recreation opportunities is mandated for most parks, and there is ample evidence to support the claim that recreation is beneficial to participants, it behooves resource managers to be aware of leisure constraints and their impact on recreationists. Walker and Virden (2005) assert that an understanding of constraints on outdoor recreation and their impact on participation is critical if natural resource managers are to be at all “effective.” To take it a step further, many previous researchers have also asserted that leisure providers can take steps themselves to reduce constraints (Backman and Wright 1990, as cited in Kay and Jackson 1991; McGuire and O’Leary 1990, as cited in Kay and Jackson 1991). Iso-Ahola and Mannell (1985) suggest that recreation providers are “expected” to eliminate constraints to participation by the very nature of their jobs.

Since there are so many possible constraints to recreation, it is important for managers to focus constraint reduction efforts on the types of constraints that are within their control, as suggested by Godbey (1985). Intrapersonal (e.g., a person lacks sufficient time for recreation) and interpersonal (e.g., a person lacks a partner with whom to recreate) constraints tend to be internal, personal, and social in nature; therefore, it can be difficult for managers to alleviate these constraints. However, structural constraints, specifically those in the natural environment, are external and are more likely to be in the control of land managers.

The leisure constraints theoretical representation includes the concept of negotiation; in many instances, this is the step in the process at which intervention from management can help alleviate constraints. Crawford, Jackson, and Godbey first introduced the idea of constraints negotiation in 1991. Prior to that point, consensus within the field was that constraints acted more as barriers to leisure, were insurmountable, and always precluded participation (Jackson et al. 1993). However, studies since then have shown that in many cases, people manage to negotiate through constraints and continue to participate in their chosen activities, but possibly in a modified fashion (Kay and Jackson 1991; Jackson et al. 1993). Some examples of constraints negotiation strategies include: gathering information to better understand recreation opportunities, improving activity skills, changing the scheduling or frequency of recreation, or making changes to other facets of life to facilitate inclusion of recreation participation (Jackson et al. 1993).

It would be difficult for managers to exert much influence in most of these specific negotiation strategies. However, they certainly can assist recreationists with information gathering. Education is one of the ways in which Iso-Ahola and Mannell (1985) suggest recreation providers apply the knowledge gained by constraints research.

Management options: natural resources as a constraint

We feel that education is possibly the main way in which resource managers can ensure the largest amount of participation and a high-quality experience for recreationists in a situation where natural resources constrain recreation. For example, if a recreationist is concerned for his or her personal safety in an area that contains bears or wolves, any information land management can provide regarding strategies to ensure personal safety has the potential to assuage many of these concerns and lead to increased participation.

We also feel that education can be beneficial in the case of *E. coli* at a park's beach. We feel that with increasing information comes increasing understanding on the public's part; they would then be less likely to form a negative attitude toward the land managers, the park, and swimming at beaches in general. It is important that the public have a full understanding of the nature of the *E. coli* that is acting as a barrier to their recreation. They should understand that while its presence within and movement through the watershed has been impacted by human activity, the bacterium is a naturally occurring phenomenon in the area. Additionally, it is important for land managers to provide information on the potential health effects of *E. coli* exposure and statistics on how many reported cases of *E. coli*-related illness they have had at their beach so the public can gain an understanding that all beach closures are instituted with their health in mind.

Also, land managers should provide information on the testing process. Standard testing protocol for fecal indicator bacteria such as *E. coli* include incubating the sample for 18–24 hours before testing. This means that swim closures can not be initiated until the day after the *E. coli* levels exceeded the limits; often the level is quite different on the following day (Rabinovici et al. 2004). Additionally, *E. coli* levels can vary across small spatial scales (centimeters to meters) meaning that measured levels are dependent on the specific sampling location (Rabinovici et al. 2004).

Perhaps some of the most important information a park can provide in this situation is to explain to users the steps the park is taking to learn more about the issue and resolve it. When we were at IDNL with Park Break 2008 we learned about important research being done to understand the movement of *E. coli* through wetland systems as well as the impact of sunlight on *E. coli*'s survivability. This education will help recreationists to understand that park managers realize the importance of the issue and are working toward a solution that will allow the removal of this constraint.

Management options: Recreation impact to natural resources as a constraint

In a situation where recreation impact to natural resources constrains recreation, education is not enough to assist would-be participants with the constraints negotiation process. In most cases, land managers have a responsibility to not only provide quality recreation but also to protect the natural resources of the area. If the natural resources of the area have been impacted to the point of constraining further recreation, neither of these goals is being attained. For example, if a trail's level of use causes erosion that acts as a constraint to trail users who favor the place, it is up to land managers to take action to address the erosion issue.

Possible actions include closing the trail to allow the area to recover and to take measures to prevent future degradation. Even though the trail closure acts as a constraint in its own right, it will address the erosion issue, thereby protecting the natural resource and allowing trail use to resume at a later date. Again, education is an important part of this constraints negotiation strategy. If trail closure is the chosen course of action, it is imperative that land managers educate recreationists about the motive behind the trail closure and actions that are being taken to rectify the problem. Proactive solutions such as this from land management will help prevent the establishment of a feedback loop in which recreationists shift their attitude toward the park, creating an intrapersonal constraint, and cease using it.

Additional strategies land managers can use to ensure a high quality user experience include an awareness of visitor satisfaction with the state of the resources within the park and current management practices. Moreover, land managers should be aware of the visitor carrying capacity of the protected area, specifically in high-use sites, so that they can limit use before resource degradation begins. In recent decades, many protected areas have been moving toward this type of thinking in land management and have instituted frameworks such as the Visitor Experience and Resource Protection (VERP) program established by the National Park Service in the mid-1990s.

Conclusion

The field of leisure constraints research can provide invaluable information to resource managers faced with the dual mandate of protecting natural resources while providing high quality recreation opportunities. To help facilitate this, we have argued for further integration of the fields of outdoor recreation research and leisure constraints research. Understanding the constraints faced by recreationists will help land managers provide recreation in a responsible manner that will benefit both the resource and the resource user. The field of leisure constraints research can provide insight particularly to land managers dealing with natural environment structural constraints. Following this line of inquiry provides insight not only to the construct of recreation constraints but also to the types of strategies land managers can use to assuage these constraints for park users.

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