

Compatibility and conflict as a conceptual basis for outdoor recreation planning

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Abstract: Outdoor recreation planning is taking on an increasing sense of urgency as open and publicly accessible lands experience increased demand pressures. As rural landscapes become fragmented by private residential and commercial developments, the extent and quality of accessible public recreation lands becomes increasingly scarce. This is exacerbated by fairly dramatic change in patterns of recreational use. Increased recreational demands matched with constraints on recreation supply have led to increased levels of crowding, displacement, and antagonism; specifically, the manner in which recreational interaction takes place lies squarely in the face of those charged with planning for future use. Recreational activities interact with different degrees of compatibility resulting in various levels of recreational use conflict. In this literature review and annotated bibliography, we critique the relevant literature on recreation conflict and forward an approach to recreation planning that focuses on managing for relative compatibilities that involves maximizing those uses thought to be complementary and supplementary while segregating those uses that are competitive and antagonistic.

Funding for this work was provided as part of the 2005-2010 Wisconsin Statewide Comprehensive Outdoor Recreation Planning process.

Keywords: Compatibility, conflict, dispute, outdoor recreation planning, leisure, management, user groups, complements, supplements, competitive, antagonistic.

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Introduction and bibliographic scope

As demands for outdoor recreation have grown, conflict among uses becomes an increasingly important issue of public recreation policy. Two alternative conflict arenas bear continued and increasingly creative management input for those charged with prioritizing scarce public resources. The first arena of conflict is that which arises between outdoor recreation and other forms of land use (Clawson 1974). This inter-use conflict has affected how open space develops and is represented by the struggles over such disparate issues as residential development, agriculture, and forest management. A perhaps more obvious arena is among alternative recreational uses of a finite land base. This intra-use conflict grows due to both increased aggregate demand for outdoor recreation (Manning and Valliere 2001) and technological change that allows new forms of outdoor recreation such as geo-caching, all-terrain-vehicles, and jet skis (Roe and Benson 2001; Wang and Dawson 2005).

The focus of this annotated bibliography is primarily on this latter challenge of how to understand and manage the interaction between recreational user groups. To gain insight into the spectrum of these interactions, our attention focuses on gaining a better understanding of how different user groups interact. This bibliography represents the foundation of applied research and is informed by a rather unique perspective in the field of outdoor recreation conflict research: land resource and environmental economics. In particular, our research builds on the concept of relative land-use compatibilities developed by Clawson (1974) and incorporates the multiple-use trade-off concepts of van Kooten (1993), formalized as multi-product “additivity” in the environmental economics literature (Bailey and Friedlaender 1982; Weitzman 1992).

Broadly speaking, this framework forwards the notion that conflict between recreational user groups can be understood as representing relative levels of incompatibility between alternative recreation uses. While clearly dependent on many factors, a specific recreation user group will be more able to interact without conflict

with some recreational user groups than they can with others. Positive outcomes result when the interaction between recreation groups is complementary (increasing rate of return with increased use) or supplementary (neutral interaction with increased use). Negative outcomes result when the interaction between recreation groups is competitive (decreasing rates of return with increased use) or antagonistic (when the presence of one activity does not allow the other to occur). Characteristics, outcomes, and examples for each interaction type are shown in Table 1. Quite simply, the challenge for land managers involves managing group interaction with an eye toward maximizing complementary and supplemental uses while minimizing those which result in competition or antagonism. To be sure, this is easier said, than done.

Table 1. Spectrum of interaction types and their recreational outcomes

Interaction Type	Key Characteristic	Outcome	Example
Complementary	Increasing rates of return with increased use	Positive sum & growing - No conflict	Canoeing and Fishing
Supplementary	Neutral interaction	Positive sum - linear Minor conflict	Snowmobiling and All Terrain Vehicle Use
Competitive	Decreasing rates of return with increased use	Trending toward zero sum - Conflict	Fishing and jetskiing
Antagonistic	Any activity of one drives the other to zero	Negative sum Strong Conflict	Wilderness camping and ATV use

This conceptual framework complements many contemporary approaches to outdoor recreation conflict management where conflict is recognized as an inevitable part of outdoor recreation, and research and management is focused on how users can cope with and respond to conflict (Hammitt and Schneider 2000).

There is a significant body of literature that has dealt with subjects such as the definition of recreation conflict, theories of recreation conflict, the determinants of recreation conflict, coping behaviors and recreation conflict management. This literature review and annotated bibliography summarizes the literature relating to compatibility and conflict in outdoor recreation. The scope of the bibliography was informed by the applied research perspective of managing outdoor recreation using a comprehensive definition of recreational compatibility. The bibliography focuses on how outdoor recreation conflict has been understood and researched from a wide-range of disciplines. Specific areas of focus included the theories and models of recreation conflict, crowding, carrying capacity, coping with conflict, types of recreation conflict, norms, managing recreation conflict, economic valuation of recreation, and compatibility.

Previous research into outdoor recreation conflict is most firmly rooted in the behavioral sciences of psychology, sociology and leisure sciences, and within the study of tourism and recreation. However, in the interest of our focus on compatibility, we have extended the bibliographic scope to include the related research disciplines of land economics, environmental economics, resource management and land-use planning. In these cases, we were searching for research that delved into the subject of relative compatibilities amongst alternative uses from an economic perspective of tradeoffs.

The Web of Knowledge, GEOBASE and AGRICOLA databases were the most useful databases for our literature searches. Specific search terms used in these datasets included *recreation, land-use, conflict, compatible, compatibilities, incompatible, incompatibilities, complements, complementary, competition, competitive, and additivity*. Additional sources were identified from the references of key articles identified in this fashion.

Several areas of recreation research were deemed to fall outside of our bibliographic scope. The broad literature on developing typologies of recreation activities and understanding recreation specialization, while germane to some of the research methods on conflict in recreation, does not squarely address understandings of

recreation compatibility or conflict. Similarly, the research on personal motivations and the benefits of recreation explores in great detail topics that are but a small component of influencing factors which may determine levels of recreational use compatibility. Research into recreation substitutes, which investigates the determinants of individuals choosing alternative non-recreational activities when engaging in their preferred activity is no longer possible, also falls outside the scope of this bibliography as it does address physical and psychological interaction between recreation users or user groups. Finally, there is a large body of literature on the management of outdoor recreation and we have only highlighted the work that deals squarely with the issue of compatibility and conflict management.

This annotated bibliography is organized into a literature review with subsections that address (a) models of recreation conflict, the literature on (b) coping strategies, a section on (c) understanding recreation conflict, (d) tools for managing conflict, and (e) compatibility of alternative recreational uses. This is followed by a comprehensive annotated bibliography with subsections containing and discussing the literature addressing the same categories while concluding with a section on economic valuation and recreation conflict.

Models of Recreation Conflict

The general lack of an overarching theoretical model on user compatibility combined with a dearth of both comprehensive approaches to compatibility and clearly accepted definitions of outdoor recreation conflict type (Hammit and Schneider 2000; Schneider 2000) has led to significant challenges in comparing research results, measuring recreation conflict effectively and inconsistencies in management strategies. The most commonly used definition of outdoor recreation conflict is the one proposed by Jacob and Schreyer (1980) where “conflict is defined as *goal interference attributed to another’s behavior*”. This definition emphasizes that conflict arises when one or more of an individual’s goals for their recreation experience encounters interference with the

activities of other individuals. Furthermore, the individual must be able to attribute the source of conflict to other individual's behavior. The need for some kind of interaction to occur between individuals has led to this type of conflict to be called "interpersonal" conflict (Vaske et al. 1995; Carothers et al. 2001). However, interpersonal conflict can occur between any combination of recreation users, recreation managers and local community members (Hammit 1998).

Based on the research at the time, Jacob and Schreyer (1980) postulated four different factors behind recreation conflicts. These include (1) activity style - the various personal meanings assigned to an activity, (2) resource specificity - the significance attached to using a specific recreation resource or recreation area, (3) mode of experience - the varying expectations of how the natural environment will be perceived, which is often related to the use of technology, and (4) lifestyle tolerance - the tendency to accept or reject lifestyles different from one's own.

Subsequent research has focused on validating these premises and, in general, suggests mixed support for these conflict antecedents (Gramann and Burdige 1981; Ivy et al. 1992; Watson et al. 1993; Ruddell and Gramann 1994; Gibbons and Ruddell 1995; Vaske et al. 2004; Wang and Dawson 2005). In some cases researchers have suggested other variables that should be added to the model including specific topics such as safety (Vaske et al. 2000) or philosophical appropriateness (Blahna et al. 1995). Watson (1994) found support for the goal interference model of conflict, but found that the strongest determinant of conflict was individual attitudes towards encountering other types of recreation groups.

Manning (1999) provides a synthesis of this modeling literature through the use of what is commonly referred to as a "goal interference model" of recreation conflict. This is schematically presented in Figure 1. In this expanded model, the four variables, interpreted broadly, postulated by Jacob and Schreyer remain, but these are seen as simply setting the preconditions for conflict. These four variables simply determine the sensitivity to conflict and other catalyzing factors or stimuli are needed to actually create conflict. These catalyzing factors may be of the interpersonal nature or the result

of different social values. Whether conflict leads to diminished satisfaction is largely dependent on whether the recreation users engage in coping behaviors.

Note from the figure that conflict antecedents and goal interference lead to conflict sensitivity. Interestingly, this one-way explanatory model of user interaction focuses solely on that type of interaction that is represented by conflict while omitting broader types of interaction. Thus, the only types of outcomes well-represented by this model are diminished satisfaction and/or a coping with conflict outcome. Clearly, this begs for a more comprehensive approach to recreation compatibility. Further, the general lack of up-front resource management input limits its applicability to resource planning and management.

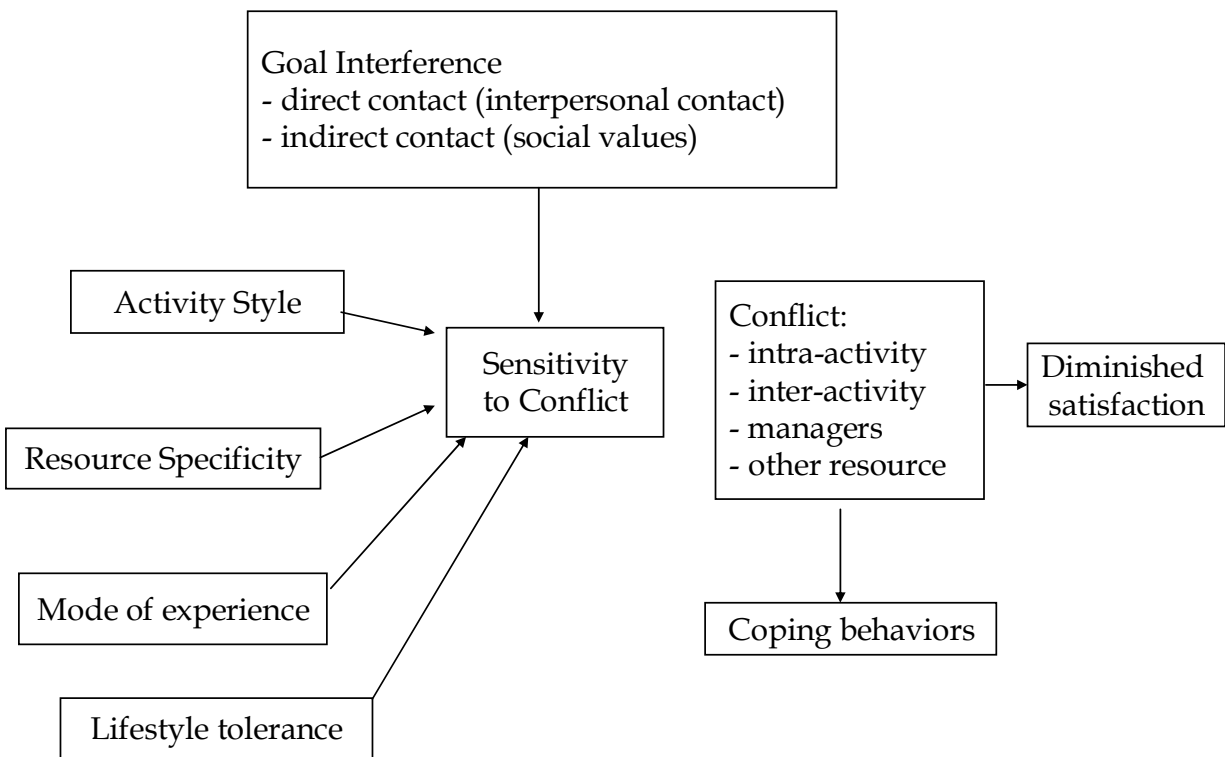


Figure 1. A goal interference model of recreation conflict (adapted from Manning 1999 p. 202)

Interpersonal conflict stands in contrast to another popular theory of recreation conflict, which attributes recreation conflict to differences in social values (Adelman et al. 1982; Saremba and Gill 1991; Carothers et al. 2001). In this model, interpersonal contact need not occur as there may be conflict over recreation management activities or goals based purely on individual beliefs or values. For example, the different values people have about treatment of animals may lead to a conflict between hunters and other recreation groups even though they never interact on the land (Vaske et al. 1995; Whittaker et al. 2001).

To be sure, significant research into the goal interference model of recreation conflict continues and there is a growing body of literature on the role of social values in helping to explain recreation conflict. Further, there have been attempts to modify these dominant conceptual bases and suggest realistic alternatives. For example, Owens (1985) suggested that recreation conflict was not the result of a single event, but rather a social process with conflict being a negative experience occurring when competition for shared resources prevents expected benefits of participation from accruing to an individual or group. Other authors have emphasized that both the goal interference and social values models only deal with the factors that lead to conflict and the recreation user's perception of the conflict (Schneider and Hammitt 1995). An equally important dimension is how individuals cope with conflict. Stress-response models have been used as theoretical construct to explain this dimension of recreation conflict (Schneider and Hammitt 1995; Miller and McCool 2003). Again, though, it is important to point out the general lack of a comprehensive approach to recreational use compatibility and solid applications useful to planners and recreation managers.

Interestingly, our critique of the modeling literature focuses on the general lack of comprehensive use compatibility models, their theoretical basis, and their application for a management-specific approach to recreation compatibility. In essence, this literature focuses on conflict from the perspective of the user ... not the planner and recreation manager.

Coping with Outdoor Recreation Conflict

One of the problematic aspects of outdoor recreation conflict research is explaining the lack of relationship that exists between conflict and satisfaction in recreation. Researchers have consistently found that visitor satisfaction remains high despite high visitor use levels (Heberlein and Vaske 1977; Manning and Ciali 1980; Becker 1981; Robertson and Regula 1994; Stewart and Cole 2001) and other recreation conflicts (Schuster and Hammitt 2000). Much of the literature on satisfaction and conflict is related specifically to crowding. While some researchers have tried to distinguish crowding as a concept distinct from conflict (e.g. Owens 1985), much of the literature either does not make that distinction or is silent on the issue. Nevertheless, researchers have consistently pointed out that an individual's satisfaction with a recreation experience is based on a complex set of factors and it is inappropriate to assume a bivariate relationship between satisfaction and conflict or crowding (Heberlein and Shelby 1977; Gramann 1982; Stankey and McCool 1984; Manning 1999).

A growing body of research has documented the prevalence of coping behaviors amongst outdoor recreationists. Coping behaviors are a mechanism that individuals have for avoiding or minimizing the negative experiences of crowding or conflict (Gramann 1982; Hammitt and Patterson 1991). Various types of coping behaviors have been documented including: displacement to other recreation sites, within the recreation site itself or to other times of the day, week or season (Becker 1981; Anderson and Brown 1984; Kuentzel and Heberlein 1992; Robertson and Regula 1994; Hall and Shelby 2000); a product shift where the individual shifts their expectation or develops a new definition for their activity more in line with current conditions (Shelby et al. 1988; Shindler and Shelby 1995); and a cognitive process of rationalization that attempts to rectify the incongruities between their expectations and the reality (Manning and Valliere 2001; Johnson and Dawson 2004). The relatively high level of coping behaviors found in outdoor recreation have led Manning and Valliere (2001) to speculate whether these are "productive" responses or are indicative of an unhealthy and ultimately dysfunctional system.

One model for coping behaviors sees them has a reaction to stress (Schneider and Hammitt 1995; Schuster and Hammitt 2000; Miller and McCool 2003). One study found high stress levels were more strongly related to direct action aimed at changing environmental conditions (such as talking to someone) or absolute displacement behaviors, while the lower stress levels were associated with cognitive coping mechanisms. Moderate stress levels were more related to substitution behaviors (Miller and McCool 2003).

Understanding Outdoor Recreation Conflict

Research on outdoor recreation conflict has revealed some of its unique features. Studies have consistently shown that the conflict can be asymmetrical (Adelman et al. 1982; Jackson and Wong 1982; Ivy et al. 1992; Gibbons and Ruddell 1995). Those users reliant on technology for their recreation experience, such as snowmobilers or heli-skiers, perceive less conflict than the recreation groups engaged in more silent pursuits, such as cross-country skiers, mountain climbers, or canoeists.

Recent research has looked at how emotions and feelings influence perceptions of conflict and satisfaction with recreation experiences (Lee and Shafer 2002; Lee et al. 2005). This research is based on affect control theory which sees happiness as based on two independent affects, positive and negative, which measure mood based on such factors as feelings of relaxation or annoyance (Diener and Emmons 1985; Watson et al. 1988). For example, cross-country skiers with recent encounters with snowmobilers had the quality of their affective experiences significantly reduced (Vitterso et al. 2004). These individuals also had significantly more negative views about the extent to which noise from snowmobiles disturbed the quality of ski-touring in general.

There is also a growing body of literature which examines issues related to crowding in outdoor recreation. Early research focused on use levels and visitor density and its relationship to visitor satisfaction (Heberlein and Vaske 1977; Manning and Ciali 1980). Lack of relationship between these two factors led researchers to

examine visitor perceptions of crowding (Vaske et al. 1980; Hammitt et al. 1984; Shelby et al. 1989; Stewart and Cole 2001) and behavioral and cognitive responses (Anderson and Brown 1984; Shelby et al. 1988; Shindler and Shelby 1995). Recent research has focused more on the concept of visitor encounter norms (Whittaker and Shelby 1988; Patterson and Hammitt 1990; Hall and Shelby 1996; Manning et al. 1999; Manning 1999; Donnelly et al. 2000; Vaske and Donnelly 2002). That is, individuals have certain expectations about how many people they are willing to encounter during their recreation experience. Only when this norm is exceeded will encounters begin to impact the quality of their experience and potentially lead to conflict.

Managing Conflict in Outdoor Recreation

Hammitt and Schneider (2000) outline the history of managing conflict in outdoor recreation. Various strategies have been proposed including (1) managing recreation areas based on social and environmental carrying capacity (Heberlein and Shelby 1977; Stankey and McCool 1984; Shelby and Heberlein 1986; Manning 1999), (2) separating uses in either time or space (Watson et al. 1993; Roe and Benson 2001), (3) educating users and managers about the issues (Peterson 1974; Blahna et al. 1995; Whittaker et al. 2001), (4) being clear about the goals of management (Clark et al. 1971; Shelby 1980) and (5) providing a spectrum of different recreation opportunities (Hammitt 1988; Manning 1999).

The most recent focus in outdoor recreation conflict management is on using visitor norms to set standards of quality or management targets (Shelby and Vaske 1991; Shelby et al. 1996; Manning 1999). In this approach a management standard can be set based on the social norm for a certain element, such as the number of people encountered on a trail or type of facilities required. A social norm is the sum of individual norms for an certain variable and can be graphed as a curve with range of acceptability on the vertical axis and the variable graphed on the horizontal (Vaske et al. 1986). Various issues have been identified in the norms research including whether

everyone really has norms – norm prevalence (Hall and Shelby 1996; Lewis et al. 1996; Donnelly et al. 2000), how important the norms are to recreationists – norm salience (Manning et al. 1996), and whether there norms tend towards a social norm – norm congruence (Manning et al. 1996). Other research has focused on appropriate measurement techniques that ensure the management standards defined by norms are defensible (Manning et al. 1999; Manning et al. 2001; Manning et al. 2002).

Compatibility Construct in Recreation Conflict Management

Despite its introduction into the literature over thirty year ago (Clawson 1974) the concept of managing a wide range of outdoor recreation activities at different scales based on an understanding of their relative compatibility has not been widely explored. Fundamentally, the goal interference model of conflict is based on the concept of incompatibilities of goals (Jacob and Schreyer 1980), but it has not been used as a management tool *per se*. The Recreation Opportunity Spectrum (Hammit 1988; Manning 1999) is a conceptual framework for encouraging diversity in outdoor recreation opportunities, but it also provides a framework for considering how to separate incompatible recreation uses and minimize conflict between these. Further, it does not provide the means for assessing relative compatibilities between alternative recreational uses or the ability of planners to encourage the management of complementary uses. The economic transformation functions of van Kooten (1993) provide an important means for conceptualizing different degree of compatibility and incompatibility and the value of managing for complementary and supplementary relationships.

Conceptually, recreational use compatibility can range from complementary and supplementary to competitive and antagonistic. The manner in which alternative uses interact is summarized in Figure 2. Complementarity reflects decreasing marginal rates of substitution between alternative recreational uses. In essence, complementarity

reflects the notion that one recreational use acts to stimulate the production of another land use.

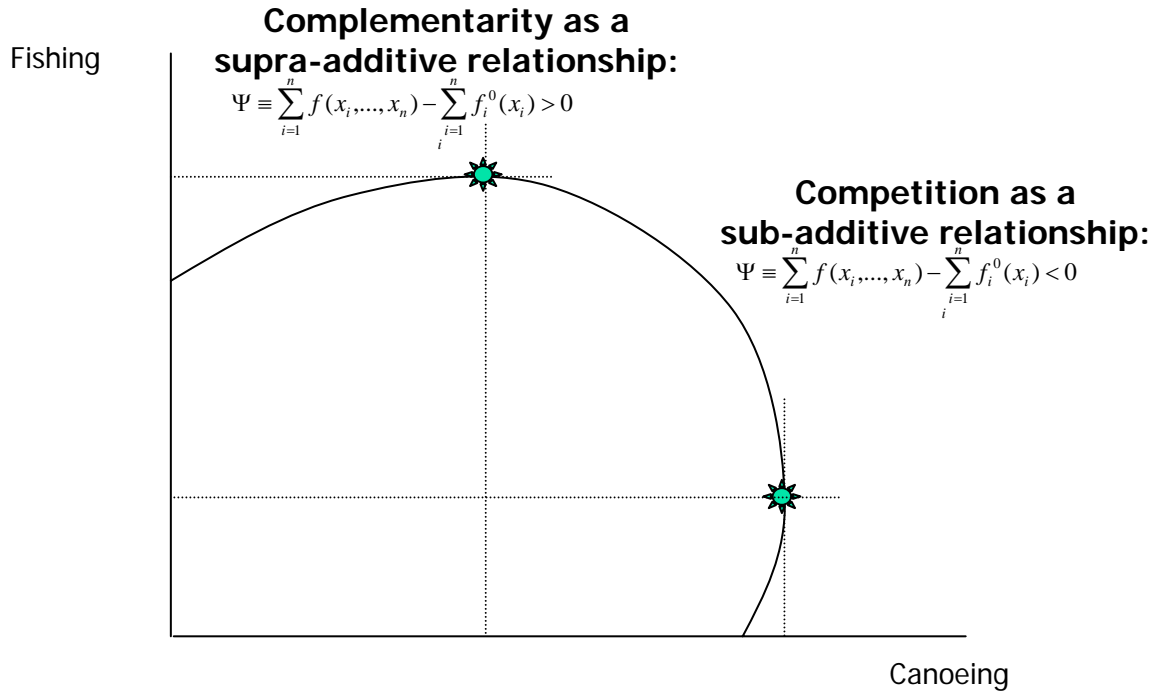


Figure 2. Complementary and competitive recreational outputs assuming alternative relative compatibilities (adapted from vanKooten 1992).

Neutral compatibility is reflective of supplementarity as shown at the point in Figure 3 where the threshold between complementarity and competitive interactions (signified by the *). In essence, supplementary land uses exist when one land use does not impact (either positively or negatively) the other. Finally, strict competitive processes in recreational use can sometimes be considered antagonistic. Basically, antagonistic land use exists when any recreational use completely reduces another.¹ Examples of this type of interaction include the obvious conflict between wilderness use

¹ This type of interaction is not shown in Figure 3 but can be thought to consist of strict tradeoffs between two recreational uses leading to a minimum outcome function.

and motorized use. In essence, antagonistic recreational uses are inimical to one another.

Environmental economists have developed a corresponding quantitative representation of this notion of compatibility in what is known as “additivity.” Using diversity as a basis, Weitzman (1992) recognized how a multivariate system relates to individual functions. In this work, alternative forms of additivity were defined. In what is termed supra-additivity, complementarity in utility is defined as increasing returns to utility by combining uses. Sub-additivity, on the other hand, occurs with alternative uses are substitutes and exist with decreasing returns to utility in their combination.²

Some attempts have been made to analyze complementarity of outdoor recreation activities. For example, Hay and McConnel (1984) found some evidence of complementarity between wildlife watching and hunting, while Fesenmaier and Lieber (1988) found many examples of compatibility between different recreation types based on household recreation choices. Recent research has found reasonable levels of compatibility amongst a range of recreational activities and different forest harvest levels, despite vociferous public debate (Dennis 1998; Marcouiller and Mace 1999).

Thus, our review of the literature on recreation compatibility and conflict delivered us to several interesting conclusions. First, the literature on recreation conflict

² This can be functionally presented if we let $F(x_1, \dots, x_n)$ be a systemwide production function defined to equal the sum of individual production functions $[f_i(x_1, \dots, x_n)]$ across the system and $f_i^0(x_i)$ is the production function of individual recreational use i . Alternative forms of additivity in the system are defined as follows:

Supra-additivity exists if and only if
$$\Psi \equiv \sum_{i=1}^n f(x_1, \dots, x_n) - \sum_i f_i^0(x_i) > 0 \quad [1]$$

Additivity exists if and only if:
$$\Psi \equiv \sum_{i=1}^n f(x_1, \dots, x_n) - \sum_{i=1}^n f_i^0(x_i) = 0 \quad [2]$$

Sub-additivity exists if and only if:
$$\Psi \equiv \sum_{i=1}^n f(x_1, \dots, x_n) - \sum_{i=1}^n f_i^0(x_i) < 0 \quad [3]$$

has a set of predefined outcomes that provide an incomplete picture of recreational interaction. This broader set of outcomes are necessary for the application of conflict and compatibility models to the usefulness of planners and recreation managers. Indeed, if our conflict outcomes are predetermined as either coping or diminished satisfaction, this overlooks the significant amount of recreational alternatives that, by and large, work well together. We offer the notion that recreation management planning necessarily must work within a glass that is half-full, not half-empty.

Further, it is apparent that if we are interested in management-specific options for improving the manner in which planning is applied to recreation management activities, there is a strong need to account for the role of management specific activities in determining the sensitivity to conflict, resulting types of recreational interaction, and their respective outcomes.

To this end, we offer an expanded goal interference model of recreation interaction as shown in Figure 3. In this expanded model, we have incorporated both the ability of interpretation and adaptive site planning as key elements that determine recreational interaction outcomes. We no longer present a model constrained by interactions limited to competition and antagonism (conflict). Indeed, much recreational interaction can be considered supplementary and/or complementary. These types of interactions would logically be addressed through planning and recreation management as warranting close scrutiny and encouragement. In this manner, we can correctly view planning as a key element of maximizing the positive-sum outcomes while actively addressing those uses in conflict through the minimization of antagonistic and competitive outcomes.

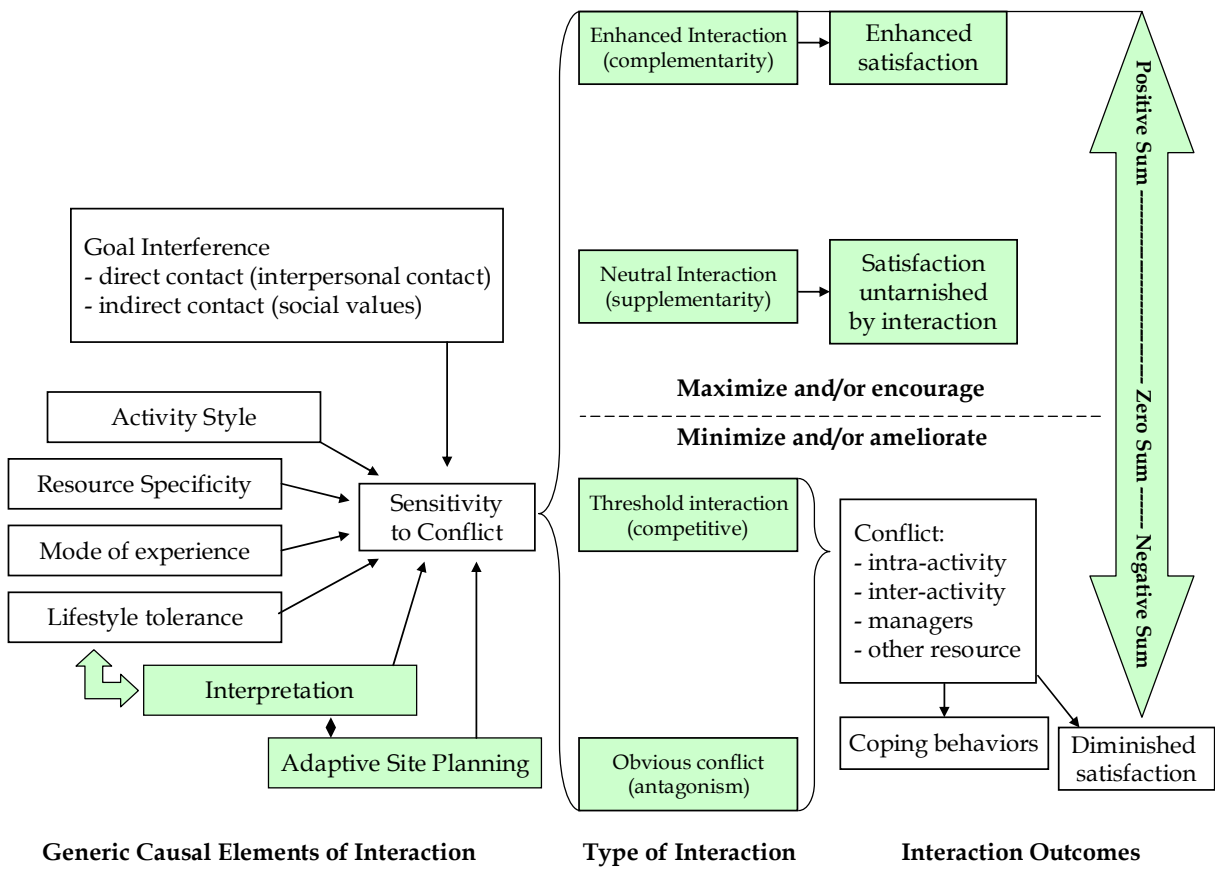


Figure 3. An expanded goal interference model of recreation interaction

Literature Cited

- Adelman, B.J.E., T.A. Heberlein and T.M. Bonnicksen. 1982. Social psychological explanations for the persistence of a conflict between paddling canoeists and motorcraft users in the Boundary Waters Canoe Area. *Leisure Sciences* 5, 1: 45-61.
- Anderson, D.H. and P.J. Brown. 1984. The displacement process in recreation. *Journal of Leisure Research* 16, 1: 61-73.
- Bailey, E. and A. Friedlaender. 1982. Market structure and multiproduct industries. *Journal of Economic Literature* 20: 1024-1048.
- Becker, R.H. 1981. Displacement of recreational users between the Lower St. Croix and Upper Mississippi Rivers. *Journal of Environmental Management* 13: 259-267.
- Blahna, D., K. Smith and J. Anderson. 1995. Backcountry llama packing: Visitor perceptions of acceptability and conflict. *Leisure Sciences* 17, 3: 185-204.
- Carothers, P., J. Vaske and M. Donnelly. 2001. Social values versus interpersonal conflict among hikers and mountain bikers. *Leisure Sciences* 23, 1: 47-61.
- Clark, R.N., J.C. Hendee and F.L. Campbell. 1971. Values, behavior, and conflict in modern camping culture. *Journal of Leisure Research* 3: 143-159.
- Clawson, M. 1974. Conflict, strategies, and possibilities for consensus in forest land use and management. In *Forest Policy for the Future: Conflict, Compromise, Consensus*, M. Clawson, ed. Washington: Resources for the Future.
- Dennis, D.F. 1998. Analyzing public inputs to multiple objective decisions on national forests using conjoint analysis. *Forest Science* 44, 3: 421-429.
- Diener, E. and R.A. Emmons. 1985. The independence of positive and negative affect. *Journal of Personality and Social Psychology* 47, 5: 1105-1117.
- Donnelly, M., J. Vaske, D. Whittaker and B. Shelby. 2000. Toward an understanding of norm prevalence: A comparative analysis of 20 years of research. *Environmental Management* 25, 4: 403-414.
- Fesenmaier, D.R. and S.R. Lieber. 1988. Destination diversification as an indicator of activity compatibility: An exploratory analysis. *Leisure Sciences* 10: 167-178.
- Gibbons, S. and E. Ruddell. 1995. The effect of goal orientation and place dependence on select goal interferences among winter backcountry users. *Leisure Sciences* 17, 3: 171-183.
- Gramann, J.H. 1982. Toward a behavioral theory of crowding in outdoor recreation: An evaluation and synthesis of research. *Leisure Sciences* 5, 2: 109-126.
- Gramann, J.H. and R.J. Burdge. 1981. The effect of recreation goals on conflict perception: The case of water skiers and fishermen. *Journal of Leisure Research* 13, 1: 15-27.
- Hall, T. and B. Shelby. 1996. Who cares about encounters? Differences between those with and without norms. *Leisure Sciences* 18, 1: 7-22.
- Hall, T. and B. Shelby. 2000. Temporal and spatial displacement: Evidence from a high-use reservoir and alternate sites. *Journal of Leisure Research* 32, 4: 435-456.
- Hammit, W.E. (1988). The spectrum of conflict in outdoor recreation. Proceedings of the Outdoor Recreation Forum Jan 13-14, 1988. Tampa: 439-450.

- Hammitt, W.E. (1998). The spectrum of conflict in outdoor recreation. Proceedings of the Outdoor Recreation Forum Jan 13-14, 1988. Tampa: 439-450.
- Hammitt, W.E., C.D. McDonald and F.P. Noe. 1984. Use level and encounters: Important variables of perceived crowding among nonspecialized recreationists. *Journal of Leisure Research* 16, 1: 1-8.
- Hammitt, W.E. and M.E. Patterson. 1991. Coping behavior to avoid visitor encounters: Its relationship to wildland policy. *Journal of Leisure Research* 23, 3: 225-237.
- Hammitt, W.E. and I.E. Schneider. 2000. Recreation conflict management. In *Trends in Outdoor Recreation, Leisure and Tourism*, W. C. Gartner and D. W. Lime, ed. New York: CABI Publishing.
- Hay, M.J. and K.E. McConnel. 1984. Harvesting and nonconsumptive wildlife recreation decisions. *Land Economics* 60, 4: 388--396.
- Heberlein, T.A. and B. Shelby. 1977. Carrying capacity, values, and the satisfaction Model: A reply to Greist. *Journal of Leisure Research* 9, 2: 142-148.
- Heberlein, T.A. and J.J. Vaske (1977). Crowding and visitor conflict on the Bois Brule River. Madison, Water Resources Center, University of Wisconsin-Madison.
- Ivy, M.I., W.P. Stewart and C.C. Lue. 1992. Exploring the role of tolerance in recreational conflict. *Journal of Leisure Research* 24, 4: 348-360.
- Jackson, E.L. and R.A.G. Wong. 1982. Perceived conflict between urban cross-country skiers and snowmobilers in Alberta. *Journal of Leisure Research* 14, 1: 47-62.
- Jacob, G.R. and R. Schreyer. 1980. Conflict in outdoor recreation: A theoretical perspective. *Journal of Leisure Research* 12: 368-380.
- Johnson, A. and C. Dawson. 2004. An exploratory study of the complexities of coping behavior in the Adirondack Wilderness. *Leisure Sciences* 26, 3: 281-293.
- Kuentzel, W.F. and T.A. Heberlein. 1992. Cognitive and behavioral adaptations to perceived crowding: A panel study of coping and displacement. *Journal of Leisure Research* 24, 4: 377-393.
- Lee, B., C. Shafer and I. Kang. 2005. Examining relationships among perceptions of self, episode-specific evaluations, and overall satisfaction with a leisure activity. *Leisure Sciences* 27, 2: 93-109.
- Lee, B. and C.S. Shafer. 2002. The dynamic nature of leisure experience: An application of Affect Control Theory. *Journal of Leisure Research* 34, 3: 290-310.
- Lewis, M., D. Lime and D. Anderson. 1996. Paddle canoeists' encounter norms in Minnesota's boundary waters canoe area wilderness. *Leisure Sciences* 18, 2: 143-160.
- Manning, R., D. Johnson and M. VandeKamp. 1996. Norm congruence among tour boat passengers to Glacier Bay National Park. *Leisure Sciences* 18, 2: 125-141.
- Manning, R., S. Lawson, P. Newman, D. Laven and W. Valliere. 2002. Methodological issues in measuring crowding-related norms in outdoor recreation. *Leisure Sciences* 24, 3-4: 339-348.
- Manning, R., P. Newman, W. Valliere, B. Wang and S. Lawson. 2001. Respondent self-assessment of research on crowding norms in outdoor recreation. *Journal of Leisure Research* 33, 3: 251-271.

- Manning, R. and W. Valliere. 2001. Coping in outdoor recreation: Causes and consequences of crowding and conflict among community residents. *Journal of Leisure Research* 33, 4: 410-426.
- Manning, R., W. Valliere and B. Wang. 1999. Crowding norms: Alternative measurement approaches. *Leisure Sciences* 21, 2: 97-115.
- Manning, R.E. 1999. "Carrying capacity: An organizational framework." In *Studies in Outdoor Recreation: Search and Research for Satisfaction*, Second Edition, 67-79. Corvallis: Oregon State University Press.
- Manning, R.E. 1999. "Crowding in outdoor recreation: Use level, perceived crowding and satisfaction." In *Studies in Outdoor Recreation: Search and Research for Satisfaction*, Second Edition, 80-121. Corvallis: Oregon State University Press.
- Manning, R.E. 1999. "Indicators and standards of quality: A normative approach." In *Studies in Outdoor Recreation: Search and Research for Satisfaction*, Second Edition, 122-155. Corvallis: Oregon State University Press.
- Manning, R.E. 1999. "Recreation conflict: Goal interference." In *Studies in Outdoor Recreation: Search and Research for Satisfaction*, Second Edition, 194-206. Corvallis: Oregon State University Press.
- Manning, R.E. 1999. "The Recreation Opportunity Spectrum: Designs for diversity." In *Studies in Outdoor Recreation: Search and Research for Satisfaction*, Second Edition, 176-193. Corvallis: Oregon State University Press.
- Manning, R.E. and C.P. Ciali. 1980. Recreation density and user satisfaction: A further explanation of the satisfaction model. *Journal of Leisure Research*: 329-345.
- Marcouiller, D.W. and T. Mace (1999). *Forests and regional development: Economic impacts of woodland use for recreation and timber in Wisconsin*. Madison, University of Wisconsin Extension.
- Miller, T. and S. McCool. 2003. Coping with stress in outdoor recreational settings: An application of transactional stress theory. *Leisure Sciences* 25, 2-3: 257-275.
- Owens, P.L. 1985. Conflict as a social interaction process in environment and behavior research: The example of leisure and recreational research. *Journal of Environmental Psychology* 5: 243-259.
- Patterson, M.E. and W.E. Hammitt. 1990. Backcountry encounter norms, actual reported encounters, and their relationship to wilderness solitude. *Journal of Leisure Research* 22, 3: 259-275.
- Peterson, G.L. 1974. A comparison of the sentiments and perceptions of wilderness managers and canoeists in the boundary waters canoe area. *Journal of Leisure Research* 6, Summer: 194-206.
- Robertson, R.A. and J.A. Regula. 1994. Recreational displacement and overall satisfaction - A study of central Iowa licensed boaters. *Journal of Leisure Research* 26, 2: 174-181.
- Roe, M. and J. Benson. 2001. Planning for conflict resolution: Jet-ski use on the Northumberland coast. *Coastal Management* 29, 1: 19-39.
- Ruddell, E.J. and J.H. Gramann. 1994. Goal orientation, norms, and noise-induced conflict among recreation areas users. *Leisure Sciences* 16, 2: 93-104.

- Saremba, J. and A. Gill. 1991. Value conflicts in mountain park settings. *Annals of Tourism Research* 18, 3: 455-472.
- Schneider, I. 2000. Revisiting and revising recreation conflict research. *Journal of Leisure Research* 32, 1: 129-132.
- Schneider, I. and W. Hammitt. 1995. Visitor response to outdoor recreation conflict: A conceptual approach. *Leisure Sciences* 17, 3: 223-234.
- Schuster, R. and W.E. Hammitt. 2000. Effective coping strategies in stressful outdoor recreation situations: Conflict on the Ocoee River. *USDA Forest Service Proceedings RMRS-P* 15, 4: 167-174.
- Shelby, B. 1980. Contrasting recreational experiences: Motors and oars in the Grand Canyon. *Journal of Soil and Water Conservation* 35: 129-131.
- Shelby, B., N.S. Bregenzer and R. Johnson. 1988. Displacement and product shift - Empirical evidence from Oregon rivers. *Journal of Leisure Research* 20, 4: 274-288.
- Shelby, B. and T.A. Heberlein. 1986. *Carrying capacity in recreation settings*. Corvallis: Oregon State University Press.
- Shelby, B., J. Vaske and M. Donnelly. 1996. Norms, standards, and natural resources. *Leisure Sciences* 18, 2: 103-123.
- Shelby, B. and J.J. Vaske. 1991. Using normative data to develop evaluative standards for resource-management - A comment on 3 recent papers. *Journal of Leisure Research* 23, 2: 173-187.
- Shelby, B., J.J. Vaske and T.A. Heberlein. 1989. Comparative analysis of crowding in multiple locations: results from fifteen years of research. *Leisure Sciences* 11: 269-291.
- Shindler, B. and B. Shelby. 1995. Product shift in recreation settings - findings and implications from panel research. *Leisure Sciences* 17, 2: 91-107.
- Stankey, G.H. and S.F. McCool. 1984. Carrying capacity in recreational settings: Evolution, appraisal, and application. *Leisure Sciences* 6, 4: 453-473.
- Stewart, W. and D. Cole. 2001. Number of encounters and experience quality in grand canyon backcountry: Consistently negative and weak relationships. *Journal of Leisure Research* 33, 1: 106-120.
- van Kooten, G.C. 1993. *Land Resource Economics and Sustainable Development: Economic Policies and the Common Good*. Vancouver: UBC Press.
- Vaske, J., P. Carothers, M. Donnelly and B. Baird. 2000. Recreation conflict among skiers and snowboarders. *Leisure Sciences* 22, 4: 297-313.
- Vaske, J. and M. Donnelly. 2002. Generalizing the encounter - norm - crowding relationship. *Leisure Sciences* 24, 3-4: 255-269.
- Vaske, J., M. Donnelly, K. Wittmann and S. Laidlaw. 1995. Interpersonal versus social-values conflict. *Leisure Sciences* 17, 3: 205-222.
- Vaske, J., R. Dyar and N. Timmons. 2004. Skill level and recreation conflict among skiers and snowboarders. *Leisure Sciences* 26, 2: 215-225.
- Vaske, J.J., M.P. Donnelly and T.A. Heberlein. 1980. Perceptions of crowding and resource quality by early and more recent visitors. *Leisure Sciences* 3, 4: 367-381.

- Vaske, J.J., A.R. Graefe, B. Shelby and T.A. Heberlein. 1986. Backcountry encounter norms - theory, method and empirical-evidence. *Journal of Leisure Research* 18, 3: 137-153.
- Vitterso, J., R. Chipeniuk, M. Skar and O. Vistad. 2004. Recreational conflict is affective: The case of cross-country skiers and snowmobiles. *Leisure Sciences* 26, 3: 227-243.
- Wang, C. and C. Dawson. 2005. Recreation conflict along New York's Great Lakes coast. *Coastal Management* 33, 3: 297-314.
- Watson, A.E., M.J. Niccolucci and D.R. Williams (1993). Hikers and recreational stocks users: Predicting and managing conflicts in three wildernesses. Intermountain Research Station Research Paper, United States Department of Agriculture, Forest Service.
- Watson, A.E., M.J. Niccolucci and D.R. Williams. 1994. The nature of conflict between hikers and recreational stock users in the John-Muir-Wilderness. *Journal of Leisure Research* 26, 4: 372-385.
- Watson, D., L.A. Clark and A. Tellegen. 1988. Development and validation of brief measures of positive and negative affect: the PANAS scales. *Journal of Personality and Social Psychology* 54, 6: 1063-1070.
- Weitzman, M.L. 1992. On diversity. *Quarterly Journal of Economics* 107: 363-405.
- Whittaker, D., M. Manfredo, P. Fix, R. Sinnott, S. Miller and J. Vaske. 2001. Understanding beliefs and attitudes about an urban wildlife hunt near Anchorage, Alaska. *Wildlife Society Bulletin* 29, 4: 1114-1124.
- Whittaker, D. and B. Shelby. 1988. Types of norms for recreation Impacts - Extending the social norms concept. *Journal of Leisure Research* 20, 4: 261-273.

Annotated Bibliography

Models of Outdoor Recreation Conflict

1. Adelman, B. J. E., T. A. Heberlein and T. M. Bonnicksen. 1982. "Social psychological explanations for the persistence of a conflict between paddling canoeists and motorcraft users in the Boundary Waters Canoe Area." *Leisure Sciences* 5(1): 45-61.

This study finds evidence for an asymmetrical conflict between paddling canoeists and motorcraft users in the Boundary Waters Canoe Area (BCWA). This paper attempts to use social psychological attraction theory to explain why the conflict occurs and persists. A field questionnaire and follow-up mailed questionnaire was administered to 300 people to test the hypothesis that perceived similarity, perceptions of the BWCA, reasons for coming to the BWCA, competition for resources, and greeting behaviors, were factors influencing the asymmetrical conflict. This study finds support for the influence of all these factors. When comparing the results to earlier studies in the BWCA, the results suggest that attitudes amongst canoeists have polarized, and not improved, over time. In contrast, the motorcraft users not only perceive paddlers as similar, but the smiles and waves of canoes while out in the BWCA only obscure the negative feelings held by canoeists.

2. Blahna, D., K. Smith and J. Anderson. 1995. "Backcountry llama packing: Visitor perceptions of acceptability and conflict." *Leisure Sciences* 17(3): 185-204.

This paper investigates the reaction of visitors to encountering a non-traditional backcountry recreational activity, llama packing. The research is based-primarily on the goal interference model of conflict, but this study also expands the conception of conflict beyond intergroup characteristics by using other metrics that measure levels of social acceptability. A survey of 337 visitors was conducted at the Bechler Meadow region of Yellowstone National Park and the Jedediah Smith Wilderness on the Targhee National Forest. Respondents were asked about past encounters with llamas, perceptions of conflicts and problems resulting from llama use, and attitudes toward five dimensions of social acceptability of llamas: social conflict, safety, physical impacts, managerial equity, and philosophical "appropriateness." Conflicts and problems related to llama use were low in both study areas, though horseback riders were more likely to have concerns than hikers. In general, the results indicate that the social acceptability of new or non-traditional activities is not just the result of judgments related to social, environmental, and managerial conditions. Factors such as safety and philosophical appropriateness were also important elements in visitors' assessments of acceptability of llama packing. Managers cannot assume that a non-

traditional activity is unacceptable and should focus on informational and educational approaches rather than simple reliance on zoning areas for different activities. Given the results of this study, managers also cannot assume that all packstock (horses and llamas) should be zoned together.

3. Carothers, P., J. Vaske and M. Donnelly. 2001. "Social values versus interpersonal conflict among hikers and mountain bikers." *Leisure Sciences* 23(1): 47-61.

This paper investigates the differences in social values and amount of interpersonal conflict between hikers and mountain bikers in Jefferson County near Denver, Colorado. This study builds on recent research that has identified social values differences as an alternative explanation to goal interference as the cause of conflict in recreation. Social values conflict does not necessarily require any contact between individuals as it is the result of different beliefs and values. The study investigates three different groups: people who hike only, people who bike only and people who engage in both. Across all three groups, hikers are less likely to be the cause of conflict. When hiking is seen as a problem, mountain bikers and dual-sport participants are more likely than hikers to report unacceptable behaviors. Hikers are more likely than mountain bikers to have a conflict with mountain bikers, whereas dual-sport participants fell in between these two extremes. This study, unlike a previous study of hunters and non-hunters, finds less social values conflict than interpersonal conflict. These two findings are not surprising given the similarity between hikers and mountain bikers and the strength of an anti-hunting sentiment in society.

4. Crawford, D. W., E. L. Jackson and G. Godbey. 1991. "A hierarchical model of leisure constraints." *Leisure Sciences* 13(4): 309-320.

This paper presents a "nested" model of leisure constraints. The model is designed specifically for explaining choices to, or not to, participate in recreation, but also to help explain further decisions such as frequency of participation, level of specialization, level of ego involvement, and even his or her definition of the situation. Some models of recreation conflict have a structure similar to this model and include many of the same dimensions. This model proposes that leisure preferences are formed are based on an absence of or confrontation of the effects of intrapersonal constraints, which involve psychological states and attributes such as stress or perceived self-skill. Next, depending on the type of activity, interpersonal constraints, such as finding a suitable partner with which to engage in the activity, need to be overcome. Finally, structural constraints, such as family financial resources, climate or work schedule, need to be overcome before a person will participate in an activity.

5. Gibbons, S. and E. Ruddell. 1995. "The effect of goal orientation and place dependence on select goal interferences among winter backcountry users." *Leisure Sciences* 17(3): 171-183.

This study uses the goal interference theory of conflict to examine a newly emerging conflict between helicopter skiing and other winter recreationists. In particular, this study examines two of Jacob and Schreyer's propositions for variables that lead to conflict: goal orientation and place dependence. This study surveys 244 helicopter skiers and 266 non-motorized backcountry users in the Wasatch Mountains in Utah. Like many previous studies, this research finds a significant asymmetrical group conflict with helicopter skiers being impacted very little by non-motorized backcountry users. Group type is the strongest predictor of whether helicopter skiing would cause goal interference. Relationships between goal orientation, place dependence, and goal interference varied depending on the kind of interference attribution and the kind of goal involved. Goal orientation is associated with setting-based goal interferences regardless of whether attributions were made to helicopter skiing or more general discourteous behavior. Place dependence is associated with both setting-based and activity-based goal interferences, but only when attributions are made to helicopter skiing.

6. Gramann, J. H. and R. J. Burdge. 1981. "The effect of recreation goals on conflict perception: The case of water skiers and fishermen." *Journal of Leisure Research* 13(1): 15-27.

This study makes an empirical test of the goal interference model of recreation conflict using a case study of water skiers and fisherman. As an early study of goal interference, it puts particular emphasis on the incompatibility with social, psychological, or physical goals of another group. This study finds only weak support for the incompatibility of goals model. Variations in conflict perception among fisherman are somewhat related to variations in recreation goals, as fisherman who place greater emphasis on tension release, various forms of escape, and nature enjoyment are more likely to define high-speed boating as "reckless". The authors speculate that much conflict is not related to goal incompatibility, but instead to competition for space. Later research on goal interference emphasizes that goal interference may occur even when recreation users share similar goals, as participating in their respective activities (and interacting in space) may be enough to cause significant goal interference.

7. Ivy, M. I., W. P. Stewart and C. C. Lue. 1992. "Exploring the role of tolerance in recreational conflict." *Journal of Leisure Research* 24(4): 348-360.

This study investigates one aspect of the goal interference model of recreation conflict, individual tolerance. This paper hypothesizes that as individual tolerance

for another activity group and one's willingness to share resources with that other activity group increases, perceived goal interference should decrease. It is that fulfillment of expectations for the number of encounters with the other activity groups would also influence conflict. If the expected number of encounters is underestimated, then perceived conflict would increase. Two regression models, corresponding to the two activity groups (motorboaters and canoeists), are developed to estimate the effect of "tolerance" and "fulfillment of expectations" on "perceived conflict". Like other previous studies, an asymmetrical conflict relationship is found between motorboaters and canoers. The model for canoeists indicates that tolerance and expectations explained 40% of the variation in conflict; while the model for motorboaters indicates that tolerance explained 13% of the variation in conflict and expectations are not significant. From a management perspective, one particular result stands out in that canoeists who over-estimate the number of encounters with motorboaters perceive less conflict. This suggests a management strategy to over-emphasize the likelihood of these experiences as a way to minimize user conflicts.

8. Jackson, E. L. and R. A. G. Wong. 1982. "Perceived conflict between urban cross-country skiers and snowmobilers in Alberta." *Journal of Leisure Research* 14(1): 47-62.

This study looks at three indicators of perceived conflict between urban cross-country skiers and snowmobilers in Alberta, Canada. The results indicate that conflict between these groups is asymmetrical with skier perceiving snowmobilers interfering negatively with their activity, while snowmobilers are indifferent to meeting skiers. While snowmobilers do not have conflict with skiers on the trail, they may have negative attitudes towards skiers because of off-site confrontations. The conflict between skiers and snowmobilers is seen as being more fundamental than simply a conflict between these two activities. Cross-country skiers have an aversion to mechanization in recreation and are motivated to recreate in order fulfill needs of solitude, tranquility, physical exercises, and to develop an awareness of the natural environment. In contrast, snowmobilers are more machine-orientated, with a leaning towards socialization, adventurousness, and escapism.

9. Jacob, G. R. and R. Schreyer. 1980. "Conflict in outdoor recreation: A theoretical perspective." *Journal of Leisure Research* 12: 368-380.

This paper develops a definition of conflict in outdoor recreation and hypothesizes four broad factors that lead to conflict. It has become the most widely used definition of conflict and the theory of conflict it proposes is labeled as either the "goal interference" or "interpersonal" model. Conflict is defined as "[f]or an individual, conflict is defined as goal interference attributed to another's behavior".

Conflict is seen as a special class of user dissatisfaction and the cause of the dissatisfaction in another's behavior. The paper uses past work on conflict to speculate that the principal factors behind outdoor recreation conflict include: activity style, resource specificity, mode of experience and lifestyle tolerance. They explore the issues related to these four factors to propose ten propositions about outdoor recreation conflict. They define activity style as "personal meanings attached to the set of behaviors constituting a recreation activity." Resource specificity is defined as "the importance and individual attaches to the use of a particular recreation resources." Mode of experience is defined as ways of experiencing the environment ranging from "unfocused to focused." Tolerance for lifestyle diversity is defined as "unwillingness to share resources with members of other lifestyle groups."

10. Manning, R. E. 1999. "Recreation conflict: Goal interference." In *Studies in Outdoor Recreation: Search and Research for Satisfaction*, Second Edition, 194-206. Corvallis: Oregon State University Press.

This chapter explores the topic of recreation conflict. It focuses particularly on the goal interference model of recreation conflict that was developed by Jacob and Schreyer (1980) and presents an expanded conflict model. Within the expanded conflict model the four variables postulated by Jacob and Schreyer remain (activity style, resource specificity, mode of experience and lifestyle tolerance), but these are seen as simply setting the preconditions for conflict. These variables, when interpreted broadly, account for all the variables found to be statistically related to conflict. However, the variables simply determine the sensitivity to conflict and other catalyzing factors or stimuli are needed to actually create conflict. These catalyzing factors may be of the interpersonal nature or the result of different social values. Conflict can occur in a number of ways: between different recreation types, between people engaged in the same activity, between users and managers, and with other users of the land or water resources. Whether conflict leads to diminished satisfaction is largely dependent on whether the users engage in coping behaviors.

11. Owens, P. L. 1985. "Conflict as a social interaction process in environment and behavior research: The example of leisure and recreational research." *Journal of Environmental Psychology* 5: 243-259.

This paper characterizes the development of the social and psychological conflict as a theoretical construct as being distinct from the crowding construct. The paper reviews much of the past crowding and "conflict" research and concludes its applied aims have been too descriptive. Conflict is defined within the environment and behavior perspective as both a process of social interaction and, more importantly, conflict is a negative experience occurring when competition for

shared resources prevents expected benefits of participation from accruing to an individual or group. Crowding is seen as a more transient, simply on the day of activity, social process, while conflict is conceptualized as an experience which is persistent over time. This model of conflict is based on concept of recreation as a social and psychological experience derived by goal-orientated behavior, but the model is held up as an alternative to the goal interference model of Jacob and Schreyer which became so popular.

12. Ramthun, R. 1995. "Factors in user group conflict between hikers and mountain bikers." *Leisure Sciences* 17(3): 159-169.

This study examines the conflict between mountain bikers and hikers using the Big Water trail system in Utah. As in previous studies a decidedly asymmetrical conflict pattern emerges with hikers perceiving much more conflict with mountain bikers than mountain bikers with hikers. Four factors are analyzed for their contribution to conflict: frequency of participation, outgroup evaluation, years of experience and leisure activity identification. A path model, which describes these factors as impacting sensitivity to conflict and sensitivity to conflict leading to conflict attribution, is tested. Outgroup bias and years of participation are found to have statistically significant effects on sensitivity to goal interference, while sensitivity is found to have a significant effect on actual conflict attribution. The authors conclude that efforts to reduce bias and promote tolerance for other user groups are an effective approach to user group conflicts.

13. Ruddell, E. J. and J. H. Gramann. 1994. "Goal orientation, norms, and noise-induced conflict among recreation areas users." *Leisure Sciences* 16(2): 93-104.

This study evaluates the goal interference theory of recreation conflict using data from a survey of 338 winter visitors to Padre Island National Seashore, Texas. The goal interference model defines interpersonal conflict as behavior of others that interferes with personal recreational goals. The model also proposes that variations in personal standards of appropriate behavior for a setting were a major source of such interference. The theory, however, does not address the possibility that some goals may be more vulnerable to interference from physically obtrusive behavior than others. This study finds that visitors motivated by goals such as being with people who are considerate and respectful of others are more likely to perceive interference from loud radios than are visitors motivated by the goal to be with friends or other people like themselves. The authors conclude that the more the success of goal achievement rests on factors beyond the direct control of the actor, the greater the likelihood of conflict. Visitors whose individual norms for radio volumes are equal to or less tolerant than the social norm are more likely to

experience interference from radios whose loudness exceeded the social norm, which supports the role of normative violations in recreation conflict.

14. Saremba, J. and A. Gill. 1991. "Value conflicts in mountain park settings." *Annals of Tourism Research* 18(3): 455-472.

This study investigates differences in attitudes amongst participants in a mountain park planning process. Residents from the resort-area town of Whistler, British Columbia and from the urban center of Greater Vancouver are surveyed (n=117) for their attitudes' towards the Ministry of Parks preservation activities. The study reveals that residents from Whistler have less support for preservation activities than do residents of Greater Vancouver. Residents from Whistler are more likely to be concerned about issues of access relating to recreation activities and ensuring the viability of the local tourism economy. In contrast, residents from Greater Vancouver are more concerned about the park being maintained as wilderness. This is may be partly due to the fact that for Greater Vancouver residents they have closer options for intensive recreation activities like skiing and mountain biking, and travel to the more distant Giribaldi Park for activities more compatible with "wilderness" such as hiking, camping and climbing.

15. Schneider, I. 2000. "Revisiting and revising recreation conflict research." *Journal of Leisure Research* 32(1): 129-132.

This commentary reviews the state of recreation conflict research. It concludes that there is much work left to be done to reveal the essence of conflict in recreation. Conceptually, recreation conflict is constrained because it remains uncertain and insufficiently modeled. Methodologically, a quantitative bias, lack of emic knowledge and an outdoor focus have impeded the advance of recreation conflict research. Areas where the foci of conflict research could be expanded include indoor recreation, personal characteristics of an individual including race, gender and sexual orientation, and conflict within and among recreation organizations.

16. Shelby, B. 1980. "Contrasting recreational experiences: Motors and oars in the Grand Canyon." *Journal of Soil and Water Conservation* 35: 129-131.

This study uses an experimental design to investigate the different experiences of motorized and non-motorized river runners in the Grand Canyon. A group of river runners traveled half the canyon in oar-powered boats and half the canyon in motor boats. People in the experiment preferred the oar-boat experience because of the pace of travel, smaller more comfortable social groupings and enhanced sensitivity to the natural environment. Many of the preferred aspects of the oar-boat experience related to style of travel and characteristics of the boat itself (e.g. size and possible speed). The author concludes that management actions need to

be related to management goals, and in particular, to managing the desired visitor experience. Given the results of this study managers will reach different conclusions if they are managing for "wilderness experience" versus managing for "excursion experience" or to "see the place." While this study does not document recreation conflict per se, the study did measure visitor satisfaction which is often used in conflict research. Additionally, motorized versus non-motorized travel on river is often a subject of intense conflict among recreation users and a particular management challenge.

17. Steinberg, P. and G. Clark. 1999. "Troubled water? Acquiescence, conflict, and the politics of place in watershed management." *Political Geography* 18(4): 477-508.

This article does not fit squarely within the goal interference literature, but its subject matter, the conflict of place, does. One of the four key factors that lead to conflict in the goal interference model is the attachment to the recreation place. This particular study investigates the controversy surrounding proposed revisions in access and recreation policy at the central Massachusetts' Wachusett Reservoir, which is a crucial source of drinking water for metropolitan Boston. This conflict exemplifies the broader tensions that exist that can exist between rural and exurban areas with metropolitan areas. Most often it is the more powerful metropolitan area and its need for resources and space for urban growth that tends to overwhelm rural concerns. In this case, it is Boston's need for safe drinking water that conflicts with the reservoir region's residents' desires for recreation and frustrations with strict controls on such things as septic systems. Despite this tension, data gathered from surveys at the reservoir, supplementary interviews, archival research, and attendance at public meetings reveal that many potential sites of acrimony are characterized by positive attempts to reclaim place rather than direct opposition to outside domination. Although tensions persist between Boston and the Wachusett region, area residents' complex valuation of the reservoir as a space of utility and a place of everyday life suggests opportunities for consensual resource coalitions and initiatives.

18. Stokowski, P. 2002. "Languages of place and discourses of power: Constructing new senses of place." *Journal of Leisure Research* 34(4): 368-382.

This article reviews the literature on the concept of the "sense of place" and its treatment in leisure research. One of the four principle factors that are seen to lead to conflict in the goal interference model is attachment to place. While this article falls outside of the recreation conflict literature, it provides an excellent review of the concept of "sense of place" which is typically used to refer to an individual's ability to develop feelings of attachment to a particular setting based on combinations of use, attentiveness, and emotion. While sense of place is often imbued with positive values, critics point out that places are more than simply

geographic sites. Places can be fluid, changeable, dynamic, contexts of social interaction and memory, and they "contain" overt and covert social practices. These practices embed in place-making behaviors notions of ideology, power, control, conflict, dominance, and distribution of social and physical resources. The scholarship emphasizes that sense of place is a socially constructed, is always in the process of being created, is always provisional and uncertain, and is always capable of being manipulated towards individual or collective ends. The author concludes that research on the sense of place in leisure and tourism should focus on language and discourse, and should begin with the question of "how are leisure places socially constructed with political consequences?"

19. Vaske, J., M. Donnelly, K. Wittmann and S. Laidlaw. 1995. "Interpersonal versus social-values conflict." *Leisure Sciences* 17(3): 205-222.

This study empirically examines the theoretical distinction between interpersonal conflict and conflict in social values using empirical data from surveys of visitors to Mt. Evans, Colorado. The results of the study indicate that interpersonal conflicts between hunters and non-hunters are relatively low, with very few non-hunters or former hunters seeing an animal being shot (less than 5%), seeing people hunting (10% or less), and hearing gunshots (15% or less). More people have seen others feeding wildlife, between 43% of non-hunters and 62% for hunters, and disturbing or harassing wildlife, 18% for non-hunters to 37% for hunters. Generally, however, the natural visual barriers and the managing agency's regulations that prohibit hunting near the road are minimized due to the mountain's natural visual barriers. However, to the extent that conflict exists with hunting associated events on Mt. Evans, much of problem stems from differences in social values held by hunting and non-hunting publics. For many of the measures reported above, there are more reported perceived problems than there are observed events. Analysis examining the interaction between type of visitor (hunters versus non-hunters) and number of prior visits (first visit, two to four visits, and five or more visits) suggests that conflicts in social values remained constant across frequency of visitation, but varies between visitor type.

20. Vaske, J., P. Carothers, M. Donnelly and B. Baird. 2000. "Recreation conflict among skiers and snowboarders." *Leisure Sciences* 22(4): 297-313.

In this study, a measure of perceived safety is added to Jacob and Schreyer's (1980) four determinants of recreation conflict to examine both outgroup and ingroup normative beliefs about unacceptable behaviors for skiers and snowboarders. Data is collected through surveys at five ski resorts in Colorado and includes survey responses from 383 skiers and 212 snowboarders. The results indicate that skiers report more unacceptable behaviors by snowboarders than by fellow skiers, and snowboarders likewise report more unacceptable behaviors by skiers than by

fellow snowboarders. The skiers and snowboarders in this study vary in terms of the four goal interference determinants of conflict - activity style, resource specificity, mode of experience, lifestyle tolerance - and the fifth determinant - safety. Only one of the determinants, activity style, significantly influences both outgroup and ingroup conflict in both the skier and the snowboarder path models. The results suggest that the goal interference model may be more applicable to outgroup conflict. The path models, however, only explain a high of 44% of the variance in conflict in the skier outgroup model and a low of 10% in the skier ingroup model.

21. Vaske, J., R. Dyar and N. Timmons. 2004. "Skill level and recreation conflict among skiers and snowboarders." *Leisure Sciences* 26(2): 215-225.

This paper examines the issue of participant skill level as a factor in outgroup and ingroup conflict by conducting surveys with skiers and snowboarders at five different Colorado ski resorts. Two particular hypotheses were tested: 1) individuals with greater skills in skiing and snowboarding would experience more conflict than those with less ability, and 2) across all skill levels, skiers and snowboarders would experience more outgroup than ingroup conflict. A total of 383 skiers and 212 snowboarders are asked to rate their skill level on a four-point scale (beginner, intermediate, advanced, or expert). Conflict is measured by asking respondents the frequency with which other skiers or snowboarders a) failed to be aware of others around them, b) were not keeping an adequate distance from others, c) failed to yield the right of way to the downhill skier/snowboarder, d) behaved in a discourteous manner, e) cut others off, and f) failed to be aware of and yield to less advanced skiers/snowboarders. The results of the study support both hypotheses. As perceived skill level increases, outgroup and ingroup conflict increases for both skiers and snowboarders. Within each skill level, skiers report more unacceptable behaviors by snowboarders than with fellow skiers, and snowboarders also identify more outgroup than ingroup conflict.

22. Wang, C. and C. Dawson. 2005. "Recreation conflict along New York's Great Lakes coast." *Coastal Management* 33(3): 297-314.

This study uses the goal interference model to research recreation conflict among three different user groups in New York State's Great Lake coastal areas. Motorboat users, personal watercraft users, and riparian landowners are asked about levels of perceived conflict and the source of that conflict. Each respondent is also asked a series of questions intended to measure different dimensions of the goal interference model: activity style, resource specification, mode of experience and lifestyle tolerance. A linear function model is constructed to model goal interference as a function of all the elements of these dimensions. Logistic regression models indicate that one or more dimensions were significant in

predicting perceived conflict and the models correctly predict conflict in 70% to 100% of the cases. While there is some variation, activity style was the most frequent significant predictor of goal interference. Generally, however, goal interference theory can be seen as a general model, and the significance of each of the four dimensions depends on the types of recreation activities and users.

23. Watson, A. E., M. J. Niccolucci and D. R. Williams. 1993. *Hikers and recreational stocks users: Predicting and managing conflicts in three wildernesses*. Intermountain Research Station Research Paper INT-468. United States Department of Agriculture, Forest Service.

This study takes a detailed look at conflicts between hikers and recreational stock users in three wilderness areas: the John Muir Wilderness; the Sequoia-Kings Canyon Wilderness and the Charles C. Deam Wilderness. Using the goal interference model proposed by Jacob and Schreyer, along with modifications suggested by subsequent research, the determinants of conflict between these two users groups are assessed through user surveys. Three measures of conflict (two attitudinal - enjoyment/ dislike and a 5-point Likert scale of desirable to undesirable - and one goal interference - interference with the quality of a wilderness experience) are used to assess 17 potential predictors of conflict. The predictors of conflict more accurately predict attitudinal measures of conflict than they predict the goal interference measure of conflict, which is a result consistent with other research. Strong and consistent predictors of conflict between hikers and horse users are general feelings of inappropriateness of horse use in wilderness, differences in perceptions of visitors' status related to horse use, differences in the strength of attachment to the wilderness, and the value placed on opportunities for solitude. From a management perspective, the option of separating uses by providing some trails for hikers is only generally supported by hikers, but not by horse users. The authors conclude that while persuasive and educational messages may reduce conflict between hikers and horse users, if managers fail to reduce the number of encounters that create conflict or impacts of horse use that hikers label as inappropriate, they may find some restrictions on horse use to be necessary.

24. Watson, A. E., M. J. Niccolucci and D. R. Williams. 1994. "The nature of conflict between hikers and recreational stock users in the John-Muir-Wilderness." *Journal of Leisure Research* 26(4): 372-385.

This study investigates the extent of conflict between hikers and recreational stock users in the John Muir Wilderness in the Sierra Nevada wilderness and tests the relative importance of various hypothetical predictors of conflict using multiple conflict measures. The ability to predict conflict between the two user groups is high when using the goal interference dimensions of conflict: definition of place,

specialization, focus of trip/expectations, and lifestyle tolerance. However, this study finds that the strongest relationship is between hypothesized determinants and the attitudes hikers maintain toward encountering stock groups, rather than between hypothesized determinants and a goal interference measure of conflict. This finding suggests that conflict may arise because of other incompatibilities besides goals, such as visitor norms.

25. Watson, A. 1995. "An analysis of recent progress in recreation conflict research and perceptions of future challenges and opportunities." *Leisure Sciences* 17(3): 235-238.

This paper reviews the progress in the field of recreation conflict research with particular reference to a special section of *Leisure Sciences*. There has never been agreement on how recreation conflict should be measured. While the Jacob and Schreyer conflict model received significant testing and modification, more recent work has proposed other models. A distinction for some authors exists between interpersonal versus values conflicts. Other authors have suggested that the goal-interference measure of conflict needs to be separated into that associated with the setting and that associated with activity. New theoretical approaches are also emerging, with conflict being seen less as a single event and more as a process. For example, a model adopted from stress theory is proposed by some authors that focuses on elements and factors which influence responses to experiencing conflict. At the time of writing this article, the author sees increased research focus on recreation conflict. Encouragingly, however, the research and proposed management actions are not focused on eliminating conflict, but on understanding and mitigating it.

26. Watson, A. E. 2001. "Goal interference and social value differences: understanding wilderness conflicts and implications for managing social density." *USDA Forest Service Proceedings RMRS-P* 20: 62-67.

This paper presents a review of the recreation conflict literature with a particular emphasis on managing recreation use densities in the wilderness. It reviews the history of recreation conflict research and highlights the time periods when various concepts were introduced into the literature. The most popular theory of recreation conflict, the goal interference model, is identified as having evolved from expectancy-valence theory. The more important a goal is to a person the more likely that failing to achieve this goal will result in conflict. It is interpersonal conflict if the visitor can attribute this loss of their goal to the behavior of someone else, rather than to other factors such as the weather or illness. Incompatibility of goals is not a requirement of conflict as some conflict can occur when people with similar goals, such as finding solitude in the wilderness, conflict with each others desire to achieve that goal. In the goal interference literature, recreation conflict is hypothesized to be at least partially fueled by perceived differences in: activity

style, resource specificity, mode of experience, and tolerance of lifestyle diversity. More recently, researchers have identified social values as an important conflict mechanism. This type of conflict often occurs not in the wilderness, but in the policy arena in disputes over the allocation of wilderness resources. This paper also reviews different methods for measuring conflict. The authors conclude that approaching social density from a conflict perspective suggests: 1) a need to understand the orientations people have towards a place of interest in terms of values, meanings, expectations, and importance of the place itself; and 2) how does interacting with various number and types of people interact with these orientations, not simply from a single dimensional crowding measure, but based on mix of human and ecological values.

27. Whittaker, D., M. Manfredo, P. Fix, R. Sinnott, S. Miller and J. Vaske. 2001. "Understanding beliefs and attitudes about an urban wildlife hunt near Anchorage, Alaska." *Wildlife Society Bulletin* 29(4): 1114-1124.

This study investigates the attitudes of residents of Anchorage, Alaska towards a management prescribed hunt to control moose populations in the city. A survey of 971 residents reveals their attitudes towards a tightly controlled moose hunting scenario with survey respondents asked to rate different hunt outcomes as likely and unlikely as well as whether they view the outcomes as good or bad. Results show that a majority (51%) support for the hunt, although 34% are opposed and 15% are undecided. Not surprisingly, there is considerable divergence in opinion between those who support the hunt and those opposed to it because of such issues as whether the hunt would reduce accidents, reduce encounters, permanently reduce numbers, injure someone, cost a lot to administer, prevent non-hunter use, or eliminate moose in the area. Respondents who are unsure about the hunt generally hold beliefs that were intermediate between those for and against the hunt, offering an explanation for their neutrality. The results reveal which hunt factors are based more on peoples' values and which factors might be influenced by management action or education programs.

Coping with Recreation Conflict

28. Anderson, D. H. and P. J. Brown. 1984. "The displacement process in recreation." *Journal of Leisure Research* 16(1): 61-73.

This paper looks at the displacement process in recreation, where users switch to using other sites, in outdoor recreation. The article attempts to explain the process from a social-psychological perspective. Displacement behaviors are modeled as being the result of attitudes towards different behaviors and an individual's expectations (norms) of behavior. In this study, user behavior and user attitudes (the normative component was not considered) are surveyed using a self-

administered questionnaire of 858 people in the Boundary Waters Canoe Area. While this study does not reveal causal relationships, it shows that factors of displacement include litter, noise, overuse, and visual encounters with others. In contrast, the study finds little support for crowding as an indicator of displacement.

29. Becker, R. H. 1981. "Displacement of recreational users between the Lower St. Croix and Upper Mississippi Rivers." *Journal of Environmental Management* 13: 259-267.

This study investigates whether there is a relationship between user density and visitor satisfaction on the Lower St. Croix and Upper Mississippi Rivers. When the rivers are viewed on their own, users on both the Mississippi and the St. Croix are equally satisfied with their experience. Like many other crowding studies, this finding seems to indicate there is no relationship between density and user satisfaction. However, when the two rivers are considered together the results demonstrate that some users who are bothered by high use levels on the St. Croix shift their activity to the Mississippi. Users on the St. Croix are more inclined towards social aspects of recreation while users on the Mississippi are inclined towards experiences of solitude and less human influence in terms of pollution, facilities or boat traffic. The authors conclude that this study demonstrates that there is a clear relationship between user density and satisfaction, but studies that do not account for displacement or other coping behaviors fail to find this important relationship.

30. Hall, T. and B. Shelby. 2000. "Temporal and spatial displacement: Evidence from a high-use reservoir and alternate sites." *Journal of Leisure Research* 32(4): 435-456.

This study investigates the amount of temporal and spatial displacement behaviors that is used by visitors in response to crowding at a popular reservoir in Oregon. Surveys of recreational users from the reservoir site itself (n=1,069) indicate that about half altered their behavior in some way because of crowding, primarily through altering the time of day, week or year that they come to the reservoir (42%) and secondarily through shifting their use to a different area of the reservoir or to another recreational area altogether (26%). The study also interviews users at nearby alternative sites (n=169) and finds about half of these people use the reservoir less than in the past. However, only half of these people attribute their shift in behavior to crowding or undesirable conditions at the reservoir. Displacement is more likely to be used as a behavior by those who have been using the reservoir for a longer period of time. Users who exhibit displacement behaviors also rate conflict with other users, lack of facility issues, and environmental degradation as a bigger problem. The study also discusses in detail areas of similarity or discrepancy with past displacement research.

31. Hammitt, W. E. and M. E. Patterson. 1991. "Coping behavior to avoid visitor encounters: Its relationship to wildland policy." *Journal of Leisure Research* 23(3): 225-237.

This study investigates the coping behaviors that backpackers use in Great Smoky Mountains National Park. Coping behaviors are one mechanism that individuals have for avoiding or minimizing negative experiences of conflict while participating in recreation activities. For backpackers interested in the solitude of wilderness hiking, coping behaviors can be used to reduce encounters and maintain wildland privacy. Results from this study demonstrate that physical coping behaviors (camping out of sight of other groups, timing trip to avoid other parties, avoiding trails which are known to be popular, avoiding the park during peak times, using more difficult trails, using trails that have not been well maintained) are used more frequently than social coping behaviors (avoiding talking to backpackers outside of own group in camp or on the trail, initiate greeting to other parties, exchange ideas about equipment and trip plans, initiate social interaction with backpackers in own party or in other parties). The study also finds that physical coping behaviors were more strongly influenced by the importance of wildland solitude and congruent encounter norms. The authors speculate that backpackers use physical coping behaviors to try and achieve the desired privacy, but should encounters occur, backpackers seem willing to accept the passive social demands of wilderness encounters.

32. Johnson, A. and C. Dawson. 2004. "An exploratory study of the complexities of coping behavior in the Adirondack Wilderness." *Leisure Sciences* 26(3): 281-293.

This study investigates the use of both behavioral and cognitive coping mechanisms by interviewing hikers (n=102) in the Adirondack Wilderness. This study looks to determine whether coping behaviors are a reasonable explanation for wilderness recreationists' high overall satisfaction levels despite reports of visitor over-crowding and other social conditions exceeding acceptable levels. Four specific coping mechanisms are investigated: temporal displacement, spatial displacement, product shift (redefining expectations or experiential definition) and rationalization (a cognitive process that attempts to rectify inconsistencies or incongruity between their expectations and what they encounter). The study finds that over half of the respondents use coping mechanisms with temporal displacement, spatial displacement and product shift being used in roughly equal proportion (30%), while rationalization is an infrequent strategy (8%). Of the users reporting coping behaviors, many used multiple strategies to maintain satisfaction levels.

33. Kuentzel, W. F. and T. A. Heberlein. 1992. "Cognitive and behavioral adaptations to perceived crowding: A panel study of coping and displacement." *Journal of Leisure Research* 24(4): 377-393.

This study uses data collected from a panel of boaters at the Apostle Islands National Lakeshore in 1975 and a subsequent resurvey (n=397) in 1985 to test the relationship of perceived crowding in 1975 to attitude changes (cognitive coping strategies), and behavioral shifts (intrasite displacement and discontinued participation at the Apostle Islands). The researchers present a hierarchical crowding model that proposes that crowding is the first coping mechanism used by those feeling crowded, intrasite displacement is used by those feeling more crowded displacement to other sites by those feeling most crowded. However, the results of this study find no support for the hierarchical crowding model. Instead, those who feel most crowded are more likely to use intrasite displacement behaviors and avoid the more crowded islands. The use of cognitive coping strategies are not significantly related to crowding scores and those boaters who stop coming to the Apostle Islands do so for reasons other than crowding. These findings indicate that intrasite displacement provides an adequate coping strategy for boaters at the Apostle Islands. The notion that increasing use levels will necessarily drive the most sensitive users away is not supported among boaters at the Apostle Islands. This may relate to specific factors at the Apostle Islands, such as not being as crowded as other areas and the diversity of sites available at the Apostle Islands, and the lack of good substitutes for the majority of Apostle Islands boaters.

34. Manning, R. and W. Valliere. 2001. "Coping in outdoor recreation: Causes and consequences of crowding and conflict among community residents." *Journal of Leisure Research* 33(4): 410-426.

This study investigates the adoption of coping behaviors - displacement, product shift, and rationalization - amongst residents of communities in and around Acadia National Park in Main. This study finds relatively high levels of coping behavior - approximately 50% for both displacement and product shift behaviors, but only 35% for rationalization - in response to perceived increases in overall recreation use levels, some recreation activities and some problem behaviors. While only 7.4% of respondents report that they no longer use the carriage roads because of the changes in use that have occurred, nearly all respondents (94%) report adopting one or more behavioral or cognitive coping mechanisms. The study concludes 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. The authors speculate on whether the high levels of coping that this study documents are "productive" responses or are indicative of an unhealthy and ultimately

dysfunctional system. The authors also conclude that "satisfaction" may be a meaningless or misleading measure for the effective evaluation of outdoor recreation experiences and that measures relating more to coping behaviors may provide managers with more useful information.

35. Miller, T. and S. McCool. 2003. "Coping with stress in outdoor recreational settings: An application of transactional stress theory." *Leisure Sciences* 25(2-3): 257-275.

In this study, coping behaviors in recreation are understood using the transaction model of stress. Within the transactional model, coping behaviors can be viewed as the result of on-going transactions among personal and environmental factors, perceptions of threat or stress, and the perceived effectiveness of coping strategies. The current study focuses specifically on the relationship between levels of stress and the types of coping strategies that recreationists use in Glacier National Park. Higher stress levels are more strongly related to direct action aimed at changing environmental conditions (such as talking to someone) or absolute displacement behaviors, while the lower stress levels are associated with cognitive coping mechanisms. Moderate stress levels are more related to substitution behaviors. These results have intuitive appeal, as direct action is used when the perceived threat increased to the point where the options of changing one's own behavior, or understandings, are no longer seen as adequate responses. The transactional stress model emphasizes that recreational conflict is product of an on-going transaction between the person, the environment and the results of coping. Recreational settings, therefore, are constantly changing not only as a result of management decision and natural processes, but also due to social processes. Coping behaviors can help recreationists maintain satisfaction with their activity, but may also change the recreational setting.

36. Robertson, R. A. and J. A. Regula. 1994. "Recreational displacement and overall satisfaction - A study of central Iowa licensed boaters." *Journal of Leisure Research* 26(2): 174-181.

This study examines the extent to which displacement occurs among boaters on the Rock Reservoir in central Iowa. Unlike previous displacement studies, this study employs a stratified random sample of boat owners, rather than Reservoir users, as its data collection methodology. Only answers from those boaters having reported at least one visit to the Reservoir are used in this study. A total of 45% of respondents indicate that they are displaced from the Reservoir because of siltation, while 14% indicated they visit the Reservoir on the weekend to avoid crowds. Boaters who are displaced from the reservoir are less satisfied with their most recent boating experience at the reservoir than those who are not displaced. The study findings also indicate that boaters are willing to make trade-offs in site

characteristics, accepting the siltation of the Reservoir to avoid crowds at the other reservoirs.

37. Schneider, I. and W. Hammitt. 1995. "Visitor response to outdoor recreation conflict: A conceptual approach." *Leisure Sciences* 17(3): 223-234.

This paper suggests that outdoor recreation conflict involves two primary dimensions: 1) a visitor's perception of conflict and 2) a visitor's response to conflict. The recreation conflict literature focuses primarily on the first dimension and almost exclusively on the "goal interference" model of conflict. Two lesser known models that also focus on why conflict occurs include a spatial model of conflict and a model of incompatibilities between recreation types based on environmental dominance and use of technology. Recreation conflict research has been insightful on revealing factors which lead to recreation conflict, but it has dealt very little with the second dimension of visitor response to conflict. This paper presents a conceptual framework based upon response to stressful situations to help explain the visitor-response dimension. The model, adapted from Lazarus and Folkman's (1984) stress-response model, suggests personal and situational factors influence a series of appraisal processes that lead to a response to conflict. Moreover this model suggests that conflict in recreation should be viewed as a process, where a situation is first evaluated as conflict and followed by a response that affects a visitor's experience.

38. Schuster, R. and W. E. Hammitt. 2000. "Effective coping strategies in stressful outdoor recreation situations: Conflict on the Ocoee River." *USDA Forest Service Proceedings RMRS-P* 15(4): 167-174.

This study surveys private boaters (mostly kayakers) on the Ocoee River and their experience with conflict on the river. Seventy-two percent of boaters have experienced some conflict. In this study, the stress-response model conceptualized by Lazarus and Folkman is tested for significance. Despite the relatively high level of conflict, the stress-response model is not supported. Like other conflict studies, this study finds no significant relationship between the conflict or the stress situation and the response. Conflict did not necessarily result in decreased satisfaction levels. Given the high levels of previous experience with boating on the Ocoee River, one possible explanation is that boaters have come to expect conflict (a social norm) and have found ways to cope with the conflict and not let it affect their satisfaction with their experience.

39. Shindler, B. and B. Shelby. 1995. "Product shift in recreation settings - findings and implications from panel research." *Leisure Sciences* 17(2): 91-107.

This study uses data from two surveys of the same individuals on the Rogue River to assess the level of product shift behaviors - users responding to changing social or environmental conditions by changing their definition of the recreation experience. River floaters who were surveyed in a 1977 study were recontacted in 1991. Results from this study confirm earlier findings and indicate that: visitors are more likely to change experience definitions than to become dissatisfied; experience definitions are altered towards higher density experiences; float party encounter norms are increased; and perceived crowding does not change. However, other findings contradict the product shift theory as norms for off-river encounters do not increase and user satisfaction decreases slightly. The authors conclude that this last finding should be viewed cautiously as satisfaction is influenced by many factors and their findings do not allow any assumptions about causality to be made.

40. Shelby, B., N. S. Bregenzer and R. Johnson. 1988. "Displacement and product shift - Empirical evidence from Oregon rivers." *Journal of Leisure Research* 20(4): 274-288.

This paper explores two hypotheses - displacement and product shift - that look to explain the apparent lack of relationship found between user density and satisfaction in recreation. In this study, displacement is defined as users responding to increasing densities by moving to more and more remote sites and product shift as users responding to increased densities by changing their definitions of their recreation experience. To study these hypotheses data from three different studies surveying boaters on the Rogue and Illinois Rivers are used. Two studies surveyed river runners on the Rogue, once in 1977 and the second time in 1984, while the survey on the Illinois was conducted in 1979. Results from these surveys support six specific conclusions: 1) users are more likely to be displaced or change experience definitions than to become dissatisfied, 2) reasons for displacement include social and environmental factors, 3) experience definitions will change toward higher density experiences, 4) encounter norms will change to higher levels, 5) perceived crowding will not change, and 6) satisfaction will remain high.

Understanding Recreation Conflict

41. Baum, A. and S. Koman. 1976. "Differential response to anticipated crowding; psychological effects of social and spatial density." *Journal of Personality and Social Psychology* 34(3): 526-536.

This paper is an example of the research work in social psychology that has become an important theoretical foundation for much of the work in recreation conflict and crowding research. In this paper, the results of experiment examining the independent and interactive behavioral responses to the effects of anticipated

social and spatial density. One aspect of the study focuses on perceptions of crowding and it finds that perceptions of crowding are influenced to different degrees by personal expectations of numbers of people, whether the subjects expected structured or unstructured environments, and the sex of the subject. In general the data suggest that social consequences of high density are more salient than spatial consequences. Crowding is a joint experience of social and spatial conditions and it is important to recognize the psychological differences between social and spatial density. Many studies have failed to account for this important distinction as well as specific intervening conditions that influence the numerous potential consequences of high density.

42. Chambers, T. W. M. and C. Price. 1986. "Recreational congestion: some hypotheses tested in the forest of Dean." *Rural Studies* 2(1): 41-52.

Many studies have failed to find an adverse relationship between crowding and visitors responses. This study looks to test a number hypotheses, which may explain these results including: influence of environmental and site factors; amount of vegetation at a site and its influence on site lines; displacement in terms of timing or choice of site; absence of expectations; or impact of investment in getting to the site. Overall the study finds most support for the vegetation, displacement and no-expectations hypotheses, with less convincing support for the environmental and investment hypotheses. Overall, the researchers find that the results of this study restore some credibility to the visitor satisfaction/density model. From a management perspective, the implications of this research are that there are clearly crowd-adverse and less crowd-averse sub-groups. Management actions that attempt to disperse all recreational pressures and facilities evenly through a recreational area may only cause conflict with the crowd-adverse sub-group, and is not necessary to ensure the satisfaction of another sub-group. The natural tendency of different sub-groups to segregate into areas of different intensity of use should not be thwarted.

43. Diener, E. and R. A. Emmons. 1985. "The independence of positive and negative affect." *Journal of Personality and Social Psychology* 47(5): 1105-1117.

This article is an example of the body of psychological literature which has investigated subjective well-being. The impact of the subjective emotional state of the recreational user on perceived conflict is now being investigated by recreation researchers who use this body of literature as their theoretical foundation. Previous researched has found that happiness is not a unitary construct, rather it is composed of two separate feelings: positive and negative affect. This study reports on the results of five different studies that, when taking together, suggest a relative degree of independence between the positive and negative affect. However, the independence between negative and positive affect is influenced strongly by time

span, independence increasing over time, and how much people feel, more independent during highly emotional times.

44. Gramann, J. H. 1982. "Toward a behavioral theory of crowding in outdoor recreation: An evaluation and synthesis of research." *Leisure Sciences* 5(2): 109-126.

In this paper, research studies on crowding in recreation are analyzed critically and compared to dominant paradigms in social psychology: crowding as stimulus overload and crowding as social interference. In the stimulus overload model, crowding perceptions are greatest when the level of social stimulation exceeds desirable levels and the individual is unable to reduce that stimulation through adaptive strategies. In the social interference model, negative perceptions of density are due to perceived interference with important psychological needs (either because of number and proximity of other people or due to objectionable behaviors) or perceived spatial requirements. Early research on crowding focused on social carrying capacity, with number and frequency of encounters being seen as relating directly to overall satisfaction levels. However, research results discredited this perspective. Social psychological views of crowding, taking into account differential interpretations of the social environment, seem to have more to offer. This paper finds strong evidence within the recreation crowding and conflict literature to support both the social stimulus model and behavioral aspects of the social interference model. Physical crowding effects of the social interference model is postulated only for very high density recreation situations.

45. Hammitt, W. E., C. D. McDonald and F. P. Noe. 1984. "Use level and encounters: Important variables of perceived crowding among nonspecialized recreationists." *Journal of Leisure Research* 16(1): 1-8.

This study looks at the perceptions of crowding amongst non-specialized recreationists - innertube floaters - on the Hiwassee River in Tennessee. Regression analysis is used to test the comparative contribution of four variables identified in earlier research as part of the perceived crowding model: use level, visual encounters, crowding expectations, and user feelings toward crowding. Only 47% of the variance among innertube floaters is explained by these variables, while 43% was explained by just the two variables of use level and reported visual encounters. As compared to studies of more specialized recreational users, such as backcountry hikers or river rafters, much less variance in perceived crowding is explained by expectations and feelings. This result makes good theoretical sense as non-specialized recreationists are not likely to have a developed norms or expectations concerning appropriateness or have much commitment to the activity in terms of equipment, trip planning or overall importance.

46. Heberlein, T. A. and J. J. Vaske. 1977. *Crowding and visitor conflict on the Bois Brule River*. Madison, Water Resources Center, University of Wisconsin-Madison.

This study describes the results of a study that interviews nearly three thousand canoers, tubers and fisherman as they left the upper Bois Brule river. Despite high user levels, up to 308 visitors on a ten mile stretch, there was no relation between use levels and satisfaction. While use level is related to perceived crowding, feeling crowded is only one aspect of overall satisfaction. The authors suggest this study casts further doubt on an econometric model of carrying capacity.

47. Lee, B. and C. S. Shafer. 2002. "The dynamic nature of leisure experience: An application of Affect Control Theory." *Journal of Leisure Research* 34(3): 290-310.

This study represents a relatively new body of research within the recreation conflict literature, that of the subjective emotional state of the user. Leisure and recreation experiences are generally believed to emerge through a dynamic interaction process. Affect Control Theory provides one basis for understanding emotions experienced during the recreation experience. This study adopts the theory and applies it a survey of 111 respondents on multiple-use trail in an urban greenway. The INTERACT II program is used to predict emotions based on respondents' evaluations of events they encounter along the trail. The paper presents specific examples from the survey of how and why emotions differ both within a respondent's experience and between respondents' experiences. For example, the event "saw a lot of fish" is associated with mostly positive emotions such as "cheerful", "pleased", "peaceful" or "serene." While the event "passed on narrow part of trail" is associated with a wider range of emotions from "cheerful" and "satisfied" to "petrified" and "gloomy." The authors conclude that Affect Control Theory is useful for examining within and between subject variations and provides reasons that help to explain why some of these differences might occur. The theory has the potential to contribute to the understanding of the complexities and subtleties of the dynamic recreation experience.

48. Lee, B., C. Shafer and I. Kang. 2005. "Examining relationships among perceptions of self, episode-specific evaluations, and overall satisfaction with a leisure activity." *Leisure Sciences* 27(2): 93-109.

This research looks at a common aspect of recreation conflict research, user satisfaction. However, the approach taken and theoretical constructs differ from past research. The purpose of this research was to investigate how satisfaction might relate to interactions that an individual has during leisure experience and to examine the relationship among emotions, episode-specific evaluations, and overall satisfaction. A research model is suggested based on Affect Control Theory, the confirmation / disconfirmation paradigm, the approach-avoidance concept,

and the sub-domain dependency theory of leisure satisfaction. Two hypotheses are proposed: 1) episodes producing positive emotions will be more favorably evaluated than those producing negative emotions; and 2) leisure participants overall satisfaction will be higher if they experience more contentment than conflict in terms of reaction to specific episodes. A survey is conducted of 145 trail users on multi-use trail in Houston, Texas. The findings indicate that evaluations of episodes are significantly related to the emotions experienced as a result of those episodes, thus confirming hypothesis 1. Furthermore, the study also confirmed hypothesis 2, with people who have over 50% of their episodes that lead to contentment having significantly different mean satisfaction than those who have over 50% of their episodes leading to conflict.

49. Manning, R. E. and C. P. Ciali. 1980. "Recreation density and user satisfaction: A further explanation of the satisfaction model." *Journal of Leisure Research*: 329-345.

This paper makes an effort to understand the user density-satisfaction relationship through both a theoretical examination and empirical research. From a theoretical perspective, density only becomes a negative situation when densities get high enough to be seen as crowding. The paper also reports empirical research from four different rivers in Vermont and represents a survey size of 866. In this case density is measured by asking respondents to report the number of people they had seen on the sampling day and their satisfaction level on a ten point scale. No relationship is found in this study between density and user satisfaction. Four possible explanations for this finding are explored: cognitive dissonance, no expectations, product shift and displacement. The authors find only limited evidence for the latter three explanations, but their methods are very preliminary in nature. Interestingly, despite their discussion of the difference between density and perceived crowding the research measures user density, while later research in the field has consistently measured perceived crowding.

50. Manning, R. E. 1999. "Crowding in outdoor recreation: Use level, perceived crowding and satisfaction." In *Studies in Outdoor Recreation: Search and Research for Satisfaction*, Second Edition, 80-121. Corvallis: Oregon State University Press.

This chapter reviews the significant body of literature on crowding in recreation. Crowding is seen as one conflict mechanism. However, the postulated "satisfaction model" - where there is an inverse relationship between crowding and recreation - has generally not been well supported by empirical research. There are a number of reasons for this including: displacement of visitors sensitive to crowding, different personal definitions of crowding, psychological coping behaviors, types of people or group encountered, the place where the encounter takes place, whether the contacts between users are measured objectively or self-reported, and, most importantly, the fact that satisfaction is a multi-faceted concept that is

influenced on partially by use level and perceived crowding. These research results have some important implications for management. In particular the author suggests that satisfaction is not an appropriate measure for managing use level and crowding. Management attention should be focused on contact levels (rather than use level) and on zones managed to encourage relatively homogenous groups in terms of party type, size, and behavior.

51. Schuhmann, P. and K. Schwabe. 2004. "An analysis of congestion measures and heterogeneous angler preferences in a random utility model of recreational fishing." *Environmental and Resource Economics* 27(4): 429-45.

This paper represents a body of literature not typically considered within the recreation conflict literature - recreational choice and demand. This paper takes a slightly different view of crowding, in that congestion (which may reach "crowding" levels) is seen as being an effective rationing device, and users likely differ in both their preferences for use and aversion to congestion. The objective of this study is to compare alternative measures of congestion for explaining site choice of freshwater anglers in North Carolina within a random utility modeling framework. The congestion measures differ with respect to the time horizon over which they are assumed to be formulated and the measure of central tendency used to represent them. This study has three important conclusions which might be useful for future recreational demand models: 1) expected congestion can be an important determinant to those making site decisions based on anticipations of site quality, 2) the manner in which expected congestion is represented can lead to substantial differences in the potential welfare gains, 3) recreational users may have heterogeneous preferences for different quality characteristics.

52. Shelby, B., T. A. Heberlein, J. J. Vaske and G. Alfano. 1983. "Expectations, preferences and feeling crowded in recreation activities." *Leisure Sciences* 6(1): 1-14.

This study investigates perceived crowding amongst different types of recreation users - hunters, canoers and river floaters. Self-reported questionnaires are administered in six different studies with a total response rate of over 3000 individuals. For each study, the users are asked to report on how many contacts they had with other users, the number of contacts they had expected during their recreational activity and what was their personal preferences as to how many contacts they could tolerate during their recreation activity. The study finds support for four hypotheses: 1) people experiencing more contacts will feel more crowded, 2) people will feel more crowded if the number of encounters exceeds preferences, 3) people will feel more crowded if the number of encounters exceed preferences, and 4) because perceived crowding involves a cognitive evaluation, models including expectation and preference variables will better explain perceived crowding than contact alone. From a management perspective,

perceived crowding can be reduced by providing a range of recreation opportunities that allow users to make choices in line with their preferences and by improving the accuracy of user expectations.

53. Shelby, B., J. J. Vaske and T. A. Heberlein. 1989. "Comparative analysis of crowding in multiple locations: results from fifteen years of research." *Leisure Sciences* 11: 269-291.

This study uses a comparative analysis of 35 studies, which represent the views of over 17,000 people in 59 different recreation settings, to study crowding in outdoor recreation. All the studies use a single-item nine-point Likert scale to assess visitor judgments of crowding. If the nine-point scale is divided to reflect the percentage of respondents experiencing at least some crowding, crowding scores ranged from 12% -100% with a mean of 57%. The comparative analysis suggests that crowding is influenced by a range of factors including time, resource availability, accessibility, convenience, and management strategy. Factors that were found not to influence crowding include the region of the United States, whether the activity was consumptive or non-consumptive, and the methodology used to collect the data (on-site surveys or mailed surveys). This study also reexamines earlier work that looked to use crowding ratings to identify areas with potential carrying capacity problems. In general, crowding does help to identify carrying capacity problems. Areas with crowding in the 35%-50% range appear to be "no problem" areas. Areas with crowding in the 50%-65% range should be looked at closely, while in areas with more than 65% crowding there is definite problem. If visitor numbers and impacts are an important part of the experience, it makes sense to freeze use levels immediately when crowding reaches 65% or greater. When more than 80% of visitors feel crowded, the only management option is to manage these areas for high-density experiences.

54. Shultis, J. 2001. "Consuming nature: The uneasy relationship between technology, outdoor recreation and protected areas." *The George Wright Forum* 18(1): 56-66.

This paper reviews the impact of technology on recreation management and the role that technological change has had on parks and recreation experiences. Empirical evidence from other studies suggests that increasing use of technology in outdoor recreation will result in a lessened emotional attachment to the land, which will in turn decrease long-term commitment to conservation. The author argues that recreationists, managers and the general public will continue to have conflicting views on how technology should be managed in parks. The author concludes that without a more of a battle from groups concerned about the impact on technological in parks and its links to a conservation ethic, managers will struggle to keep new technologies from having an impact on recreation experiences.

55. Stewart, W. and D. Cole. 2001. "Number of encounters and experience quality in grand canyon backcountry: Consistently negative and weak relationships." *Journal of Leisure Research* 33(1): 106-120.

This study explores one of the most common topics of outdoor recreation research, the relationship between encounters and the overall quality of recreation experience. Many previous studies have found a weak relationship between satisfaction with the recreation experience and the influence of encounters with other recreationists. The literature, however, is unclear whether this finding relates to methodological issues or whether it is a finding that reveals a fundamental lack of relationship. This study, therefore, uses a more novel research method, a diary-like method, to control for variation in person-based effects (e.g. differences in expectations and motivations between individuals), and a multi-item scale designed to capture more variation in total experience quality. A total of 185 overnight backpackers to the Grand Canyon National Park are surveyed to explore the relationship between number of encounters, crowding, solitude/privacy achieved, and overall experience quality. The results indicate that most backpackers are negatively affected by encountering more groups, but the resultant effect is small. The authors believe that this result implies that managers should be reluctant to justify use restrictions as an attempt to provide higher quality visitor experiences. Instead, managers need to develop a careful understanding of the regional supply and demand for different types of recreation experiences, including low density experiences, as these factors are more likely to provide the basis for wise decisions about use limits.

56. Stokols, D. 1978. "In defense of the crowding construct". In *Advances in Environmental Psychology: Volume 1, The Urban Environment*, edited by A. Baum, J. E. Singer and S. Valins, 111-130. Hillsdale: Lawrence Erlbaum Associates.

This chapter reviews the psychological research literature on crowding as of 1978. While not focused specifically on crowding in recreation, it examines some of the theoretical underpinnings of crowding research. The article reviews the debate between those who believe that crowding should be seen simply as a condition of the environment, namely high density or spatial restriction, and those who feel crowding can be best understood as a motivational state involving the need for more space or increased privacy or reduced stimulation. These two approaches are labeled the physicality and psychological approaches. The article concludes that the latter perspective is more appropriate (subsequent literature into recreation conflict and crowding supports this position) and describes in some detail the implications of a crowding construct. The crowding construct essentially sees crowding as a phenomenon that is the result of both environmental and behavioral

dimensions and leads to both coping strategies and negative behavioral effects (when coping is unsuccessful).

57. Vaske, J. J., M. P. Donnelly and T. A. Heberlein. 1980. "Perceptions of crowding and resource quality by early and more recent visitors." *Leisure Sciences* 3(4): 367-381.

This study explores the relationship between the year boaters made their first trip to the Apostle Island National Lakeshore and their current evaluations of the resource. A survey of 647 boaters in 1975 is divided into three groupings: 1) those who first visited the islands prior to the areas national designation in 1970 (n=214), 2) those whose first visit to the islands occurred between 1971 and 1974 (n=197) and those who made their first visit during 1975 (n=236). While the number of encounters for the three visitor groups are not significantly different, the earliest visitors were more likely to feel that there are too many boaters and campers using the islands and are more likely to express feelings of being crowded. Earlier visitors also perceive significantly greater levels of environmental damage. The research finding supports the notion that visitors' expectation will influence their perceptions of the current conditions of recreation areas, and more recent visitors may have different expectations about what is appropriate.

58. Vaske, J. and M. Donnelly. 2002. "Generalizing the encounter - norm - crowding relationship." *Leisure Sciences* 24(3-4): 255-269.

This article examines the theory that predicts that when encounters exceed a visitor's norm for seeing others, crowding will increase. Data from 13 different studies, which included both high- and low-density study sites, 12 different activity types and a total sample size of 10,697, is used in this study. Recreation encounters are measured by asking respondents to indicate the number of people they remembered seeing and crowding is measured using a 9-point Likert scale. Individual encounter norms are determined by asking respondents to specify the highest number of encounters they would tolerate for a given situation. The study finds that crowding is significantly higher for individuals who indicate more encounters than their norm. However, respondents only feel "Slightly" to "Moderately" crowded, indicating a medium strength relationship. This relationship is found for three different predictor variables: backcountry versus frontcountry; type of activity (e.g. canoers, hikers, hikers, anglers); and whether there conflict or no conflict. These findings highlight the importance of measuring all three concepts - encounters, perceived crowding and norms - to develop an understanding of how the existing conditions compare to the standards for the experience to be offered.

59. Vitterso, J., R. Chipeniuk, M. Skar and O. Vistad. 2004. "Recreational conflict is affective: The case of cross-country skiers and snowmobiles." *Leisure Sciences* 26(3): 227-243.

This study uses a novel field experiment to test the assumption that subjective feelings are important in recreation conflict. During a weekend, cross-country skiers in a popular recreation area are assigned randomly to an experimental group who are exposed to an operating snowmobile, and a control group who are not exposed. In the experimental group, skiers are asked to fill out a self-administered survey shortly after encountering a snowmobile, while skiers in the control group fill out a self-administered survey without having been exposed to a snowmobile. Survey respondents are given no clue as to the relationship of the snowmobile and the survey being conducted. Results show that relative to the control group, skiers who encounter a snowmobile have the quality of their affective experiences - as measured by feelings of relaxation, peacefulness, joy, harmony, annoyance - significantly reduced. This result points to the subjective nature of recreation conflict. Furthermore, the encounter with the snowmobile effects the participants' beliefs about the extent to which noise from snowmobiles disturbs the quality of ski-touring in general.

60. Watson, D., L. A. Clark and A. Tellegen. 1988. "Development and validation of brief measures of positive and negative affect: the PANAS scales." *Journal of Personality and Social Psychology* 54(6): 1063-1070.

This article is an example of the body of psychological literature which investigates subjective well-being. The impact of the subjective emotional state of the recreational user on perceived conflict is now being investigated by recreation researchers who use this body of literature as their theoretical foundation. Given the results of studies showing a consistent independence between positive and negative dimensions of affect, this research develops and tests two ten-item mood scales. The scales are shown to be highly internally consistent, largely uncorrelated, and stable at appropriate levels over a 2-month time period.

61. Westover, T. N. and J. R. J. Collins. 1987. "Perceived crowding in recreation settings: an urban case study." *Leisure Sciences* 9: 87-99.

This study, unlike much of the work on crowding and conflict in recreation, investigates crowding at Potter Park, an urban park in Lansing, Michigan. A total of 154 park users are surveyed for their perceptions of crowding, inappropriate behavior and dissimilar others. Overall these findings demonstrate relatively low levels of perceived crowding even though there are relatively high visitor numbers. However, compared to outdoor and wilderness recreation studies, this study finds that actual use levels were more closely associated with crowding

evaluations than in other studies. A number of factors may have influenced these results, including small park size and lack of visual screening. It may also be that the perception of visitor densities in urban parks is less value-laden than it is in outdoor recreation and based more on visual levels than on beliefs about appropriate use levels. Other factors and their relationship to perceived crowding are also investigated including socio-economic status. Individuals with higher socio-economic status are less likely, rather than more likely as has been the case in outdoor recreation studies, to perceive crowding, and particularly during high use time. This may be the result of a wider range of experience and expectations that match actual experience more closely. Moreover, the higher proportion of well-educated people during low use times may suggest that these individuals may have a wider range of site choices and avoid the park during times when they expect it be unacceptably crowded.

Managing Recreation Conflict

62. Alston, R. M. 1975. "The natural resources decision-maker as political and economic man: toward a synthesis." *Journal of Environmental Management* 3: 167-183.

Within the natural resource decision-making environment managers must deal with long-run considerations of multifaceted goals, conflict among agency clientele, and ill-defined or non-existent norms of social welfare. This paper examines two sets of decision rules for planning, the economic benefit-cost analysis and the sociological conflict approach, and suggests a way toward a useful integration. Integration of the two approaches, from both a conceptual and practical perspective, can aid the decision-maker in selecting those alternatives that combine long-term policy considerations with short-run economic efficiency objectives. In particular, the concept of social cleavage is used to explain conflict over resource policy. The goal is to minimize the polarizing impact of cleavage - where no common values are shared between stakeholders - and take advantage of cross-cutting cleavages - where stakeholders may have share common values on some issues but not on others. By acting strategically managers can look for opportunities to use cross-cutting cleavages as a basis for compromise and negotiation. Public involvement at the program level, rather than the project level, will aid in managers in avoiding polarizing cleavages.

63. Chavez, D. J. 1996. *Mountain biking: Issues and actions for USDA Forest Service managers*. Pacific Southwest Research Station Research Paper PSW-RP-226. Albany, USDA Forest Service.

This is largely a descriptive study of the types of issues that USDA Forest Service managers encounter with the management of mountain biking on Forest Service

lands. A number of issues are identified including issues of management, resource damage, user conflicts, safety and accidents. In terms of user conflicts, managers are asked to indicate the actions that they use to minimize conflicts. Survey respondents indicate four broad categories of actions, which are listed in ranked order by frequency of use: information/education, cooperation, visitor restrictions, and resource hardening.

64. Clark, R. N., J. C. Hendee and F. L. Campbell. 1971. "Values, behavior, and conflict in modern camping culture." *Journal of Leisure Research* 3: 143-159.

This study investigates the possible difference in values and behavior between campers and campground managers. It finds that managers and campers subscribe to similar goals associated with camping, but they disagree about the types of activities which are appropriate for attaining those goals. In particular, campers at developed campgrounds share with managers the value of having contact with the environment or seeking isolation, but unlike managers they feel that these goals are attainable in developed campgrounds. Other differences between the two groups include views on the behaviors of other campers or illegal activity. Like other studies, the results of this study emphasize the importance of being clear about whose values or norms are reflected in the recreation management goals. Similarly, this study finds that campers are more tolerant of potentially conflict causing behaviors and managers need to consider how this type of finding should influence their recreation conflict management strategies.

65. Clawson, M. 1974. "Conflict, strategies, and possibilities for consensus in forest land use and management". In *Forest Policy for the Future: Conflict, Compromise, Consensus*, edited by M. Clawson, 105-191. Washington: Resources for the Future.

This article explores different possibilities for forest management with regard to intensity of harvest and management actions. As part of the analysis framework, a compatibility matrix is developed that relates different uses of the forest land-based to each other. Different uses, such as "recreation opportunity", "wood production", or "wilderness" are compared for their relative compatibility as land-uses. The framework, and the relatively incompatibility amongst different uses, leads to a consideration of the merits of a strategy that includes intensive forest management on a smaller acreage with other uses dominating in more areas (than was the current practice at the time).

66. Cordell, H. K. and M. A. Tarrant. 2002. *Socio-6: Forest-based outdoor recreation*. Retrieved October 4th, 2005.
<http://www.srs.fs.usda.gov/sustain/draft/socio6/socio6.htm>.

Within this larger review of forest-based recreation in the Southern United States, the authors conduct a brief review of the recreation conflict literature. The authors find a general increase in recreation-based conflict due rising demand and increase in technology-driven activities. For managers, early detection of user conflicts and effective conflict resolution depend on understanding where and how conflicts arise. Resolving conflict at its initial stages can help avoid costly political and legal actions. Two primary conceptual models are seen as helping managers understand recreation conflict: the cognitive (goal interference) and normative models (social values).

67. Dennis, D. F. 1998. "Analyzing public inputs to multiple objective decisions on national forests using conjoint analysis." *Forest Science* 44(3): 421-429.

This study focuses on public perspectives of multiple-use regimes in national forests. The emphasis is not only on the compatibility of different recreational uses, but also the compatibility between different recreational uses and different types of forest management. This study employs a conjoint ranking survey to solicit public preferences for various levels of timber harvesting, wildlife habitats, hiking trails, snowmobile use, and off-road vehicle access in the Green Mountain National Forest. Despite high levels of conflict and extreme positions being declared during public debates on these issues, this study finds more tempered opinions. Respondents prefer moderate levels of timber harvesting and snowmobile access, and lower levels of off-road vehicle access. They favor a mixture of mature closed canopy and younger more open forests over either extreme and are somewhat indifferent toward extending the network of hiking trails. This study illustrates one approach for determining peoples' perceptions on the relative compatibility between different recreation uses.

68. Donnelly, M., J. Vaske, D. Whittaker and B. Shelby. 2000. "Toward an understanding of norm prevalence: A comparative analysis of 20 years of research." *Environmental Management* 25(4): 403-414.

This paper examines the results of 30 studies on recreation encounter norms and their prevalence. Norms define what behavior should be, rather than what the behavior actually is. Encounter norms refer to people's expectations in terms of the number of encounters they would tolerate before their recreation experience would change. In some cases, when an individual's norms are not met, conflict may occur. Norm prevalence refers to the proportion of people in a population who can articulate a norm in a specific context. This paper empirically examines the prevalence of encounter norms in 56 evaluation contexts. Four predictor variables are examined. (1) type of resource, (2) type of activity, (3) type of encounter, and (4) question response format. Many of the results confirm existing hypotheses: norm prevalence varies according to whether the activity occurred in

the backcountry or frontcountry with backcountry users more likely to have a norm; in situations where conflict exists norms are more likely to occur; and studies that use a two-category response option (number and "makes no difference to me") have more norms reported than studies that uses a three-category response format (also includes "makes a difference but I can't give a number). The three positive independent variables explained 64% of the variance in norm prevalence. In contrast, the type of activity (consumptive versus non-consumptive) has no influence on norm prevalence, but it may be that specific types of activities or levels of specialization are more meaningful categories.

69. Fesenmaier, D. R. and S. R. Lieber. 1988. "Destination diversification as an indicator of activity compatibility: An exploratory analysis." *Leisure Sciences* 10: 167-178.

The paper explores the compatibility between different recreational activities in Oklahoma. This exploratory study uses regression analysis to measure the interrelationships between outdoor recreation activities. By looking at the type of outdoor recreation activity and the number of facilities where households choose to engage in those activities, the study is able to measure the relative compatibility between different activities. The study finds compatibility amongst many activities and relatively few instances of incompatibility. However, given the study methodology, the relative compatibility is most often related to the current configuration of recreation sites - such as tent camping and day hiking which are available together at many locations in Oklahoma - rather than the nature of the recreation activity.

70. Hall, T. and B. Shelby. 1996. "Who cares about encounters? Differences between those with and without norms." *Leisure Sciences* 18(1): 7-22.

The normative approach can be used to set management objectives for acceptable standards of outdoor recreation. The goal is to provide visitors with the desired experience and, as a result, minimize potential conflicts. In theory norms can be used to set the management standards when there is substantial agreement among recreationists. Some research, however, has found that this may not be possible. This study uses a sample of hikers and stock users from the Eagle Cap Wilderness in Oregon to investigate the relationships between variables including mode of travel, destination (high or low-use), past wilderness experience, attitudes toward impacts, attitudes toward management practices, and the presence of individual norms for encounters. Approximately 44% of respondents report a norm for encounters with others, 29% said encounters matter but do not give a number, and 28% said that encounters do not matter to them. Residence, trailhead use level, and past wilderness experience are related to the presence of norms. Those with norms

are more likely to rate social and ecological impacts as problems and are more supportive of restrictive management practices.

71. Hammitt, W. E. 1988. *The spectrum of conflict in outdoor recreation*. Proceedings of the Outdoor Recreation Forum, Tampa, Florida.

This paper discusses the Recreation Opportunities Spectrum (ROS) framework, which offers a means for planning and managing recreation lands so as to prevent potential conflict situations from occurring. The paper relies on the goal interference model of conflict for understanding how conflict arises. The degree of recreation conflict is seen to be influenced by three primary characteristics: 1) spatial and temporal proximity of activities; 2) degree of environmental dominance inherent in each activity (e.g. consumptive vs non-consumptive); and 3) the extent of participants' dependence on technology. Conflict also occurs among different combinations of three actor groups: visitors, park managers and adjacent community members. The ROS framework adopts the viewpoint that recreation resource managers produce recreation opportunities. A recreation opportunity has three components: an activity, a resource setting, and an experiential component. This paper identifies the potential for conflict within each of these three components and suggests methods for avoiding and mitigating in each of these cases.

72. Hammitt, W. E. and I. E. Schneider. 2000. "Recreation conflict management". In *Trends in Outdoor Recreation, Leisure and Tourism*, edited by W. C. Gartner and D. W. Lime, 347-356. New York: CABI Publishing.

This article reviews the study and management of conflict in recreation. It emphasizes that conflict does not always lead simply to negative impacts, but can have positive influences. For example, conflict can indicate when something within the current system needs attention and force a management response. Four eras of recreation conflict management are discussed. The first era, the activity-space allocation era, focused on the issue of competition for recreation space and emphasized issues relating to crowding, over-use, and activity and space incompatibility. Management actions focused on separating uses in both time and space. The second era, the perception-cause era, focused on understanding the behavioral aspects of recreation conflict with a focus on motivations, user perceptions, preferences and social carrying capacity. Management actions in this era focused on education programs, the recreation opportunity spectrum and social carrying capacity models. The third era, the institutional-public involvement era, was dominated by an emphasis on values and interest groups in the planning process. During this era management made attempts, which were often mandated, to involve the public in decision-making. In the fourth era, the coping-resolution era, recreation conflict is recognized as an inevitable part of outdoor recreation

and, instead, research and management are focused on how people cope with and respond to conflict. Management is increasingly focused on more participatory involvement of stakeholders and the recognition that conflict cannot be avoided, but multiple strategies exist to minimize the amount and the negative impact of the conflict that does occur.

73. Harsay, J. G. 1978. "Efficiency, adaptability, and compatibility in multiple land use." *Environmental Management* 2(3): 204-208.

This overview article looks at the relationship between specialization and adaptability in terms of long-term efficiency for multiple land-uses. Multiple-use land management should be about finding an optimal combination between specialization and generalization. With specialization comes intensity of use and the compatibility between land-uses decreases. While the potential for compatible land-uses increases as ecological diversity also increases. These simple, yet important, relationships need to be considered as managers consider compatibility amongst recreation uses and between recreation uses and other land-uses.

74. Hay, M. J. and K. E. McConnel. 1984. "Harvesting and nonconsumptive wildlife recreation decisions." *Land Economics* 60(4): 388--396.

This study addresses the question of whether individuals make joint decisions to hunt and observe wildlife. Using data from national surveys conducted in 1971 and 1975, a recreation participation decision model is constructed. The analysis demonstrates some degree of complementarity between the two uses. The results point toward the important conclusion that natural resource policy decisions will not only have direct effects on the activity of interest, but important indirect effects on activities complementary to the activity of interest. When model equations are specified without considering the possibility of joint participation decisions, they may exclude important determinants, include variables incorrectly, or, in general, be misspecified.

75. Heberlein, T. A. and B. Shelby. 1977. "Carrying capacity, values, and the satisfaction Model: A reply to Greist." *Journal of Leisure Research* 9(2): 142-148.

The paper examines issues relating to the measurement of visitor satisfaction levels and the relationship to establishing carrying capacities in recreation management. The article finds that is impossible to set carrying capacities based on satisfaction levels as there are no mean differences in the satisfaction levels associated with different use levels. Other factors, such as peoples' choice to pursue the activity, their expectation of enjoyment, their choice to recreate elsewhere or changes in their tolerance for crowding, may have significant influence on satisfaction levels. Furthermore, the "satisfaction" model assumes a bivariate relationship between

satisfaction and user densities, which is not an accurate depiction of the complex nature of the recreation experience. Management of recreation areas for maximum satisfaction is simply not an appropriate goal, as radical options like building a parkway along the Grand Canyon may actually result in higher total levels of satisfaction (due to increases in visitor numbers). Rather, recreation management is about defining appropriate goals for different recreation areas and then setting capacity levels that will achieve those goals. Similarly, goals for acceptable conflict levels allow managers to choose appropriate management actions.

76. Heywood, J. L. 1993. "Game-theory: A basis for analyzing emerging norms and conventions in outdoor recreation." *Leisure Sciences* 15(1): 37-48.

This article examines games of conflict, cooperation, and coordination for their relevance to understanding outdoor recreation behavior. Typically, in conflict games players receive zero-sum payoffs, while cooperation games have non-zero sum payoffs. Cooperation games are problematic because they have only one equilibrium solution that players often fail to recognize. Coordination games, in contrast, present multiple equilibrium solutions. In this article the "Prisoner's Dilemma" cooperation games is presented as a basis for understanding how norms can emerge from negotiated solutions to recreation activity. For example, non-motorized users and motorized users may agree on how to zone a park for equal benefit. However, when one member of either of these groups violates the zoning agreement, all members of the group may be punished for their actions. While the concept of cooperative problem-solving provides some insight into some aspects of recreation behavior and conflict, they are applicable only to a narrow range of recreation management problems such as activity appropriateness or providing recreation opportunities. Coordination games illustrate a wider range of recreation management problems where multiple equilibriums exist. As long as equilibrium is found, then conflict between user groups is avoided. Examples include who yields to who on right of ways (as long as one group yields to the other) or trash disposal in backcountry-wilderness areas (as long as a strategy is agreed upon - carry-out or burn and bury). Coordination games can be solved through oral communication or, more likely, through the establishment of a system of suitably concordant mutual expectations. The way that people understand and solve coordination games forms a basis for understanding how behavior conventions emerge, are maintained and lead to individual norms.

77. Levine, R. L. and E. E. Langenau Jr. 1979. "Attitudes towards clearcutting and their relationships to the patterning and diversity of forest recreation activities." *Forest Science* 25(2): 317-327.

This study explores whether attitudes towards clearcutting are dependent on the types of recreational activity that people engage. The study groups recreational

users into activity clusters based on the type of recreational activities people are engaged in and into patterns that are related to the diversity of recreational activities that people are engaged in. Of the five activity clusters identified, only the hunting and motor clusters have a significant correlation with clearcutting agreement. Diversity of recreational pursuit does have a significant relationship with clearcutting agreement, with the mean level agreement of being significantly higher for those recreationists who engage in diversity of activities compared to those who engage in only a few activities. From a conflict perspective, this study highlights that compatibility amongst different land uses may be just as or more dependent on factors that increase peoples tolerance or understanding, such as engaging in many different types of recreational activities, as it is on the type of activities involved in the potential conflict.

78. Lewis, M., D. Lime and D. Anderson. 1996. "Paddle canoeists' encounter norms in Minnesota's boundary waters canoe area wilderness." *Leisure Sciences* 18(2): 143-160.

Debate exists about whether encounter norms are measurable and whether encounter norms accurately represent visitors' preferences about acceptable use levels. This study collects "trip diaries" from paddle canoeists in the Boundary Waters Canoe Area Wilderness to collect data on their actual encounters and preferences for acceptable use levels that would not spoil their sense of being in the wilderness. Findings suggest personal and social encounter norms can be defined by most paddle canoeists that accurately express desired encounters with other parties. However, variability among social encounter norms was discovered. Despite this, the authors suggest that managers should consider encounter norms as a key source of information for future management decisions. Encounter norms offer an important method for setting management standards that are likely to mitigate visitor conflict and ensure maximum visitor satisfaction. However, given the lack of norm consensus in this study, future normative research should focus on developing a better understanding of normative consensus issues. Although much research has examined normative consensus, few findings specify what constitutes sufficient agreement among encounter norms.

79. Manning, R., D. Johnson and M. VandeKamp. 1996. "Norm congruence among tour boat passengers to Glacier Bay National Park." *Leisure Sciences* 18(2): 125-141.

Visitor norms, both personal and social, are increasingly being used to set management goals and standards of quality in recreation. Setting appropriate management goals is a key strategy for managing conflict in recreation. An important research question, however, is whether visitors' evaluations and behavior are congruent with norm-based standards. This study tests norm congruence among tour boat passengers to Glacier Bay National Park. A sample of

tour boat passengers is surveyed to determine: (a) personal norms for the number of watercraft and aircraft seen, (b) number of watercraft and aircraft seen, and (c) the effect of watercraft and aircraft seen on enjoyment. The results of this study are somewhat mixed. When viewing the sample as a whole, the findings indicate a moderate level of norm congruence. However, a subpopulation of respondents that constitutes a stricter test of norm congruence suggests a substantially higher level of norm incongruence. The paper explores a number of reasons that might help explain these results including: the need for some latitude around a personal norm; the small number of watercraft/aircraft dealt with in this study; the study actually found little "extreme" incongruence which may be a better measure; that a visitors evaluation of an encounter may depend on the behavior of the watercraft/aircraft; the global measure of enjoyment are used to measure norm congruence which may be inappropriate; normative standards may be more fully developed by recreation specialists; and the possibility that the norms being measured in this study are not important to visitors (norm salience) which may lead to challenges in visitors establishing a norm.

80. Manning, R., W. Valliere and B. Wang. 1999. "Crowding norms: Alternative measurement approaches." *Leisure Sciences* 21(2): 97-115.

This article compares three different issues related to norm-measurement in recreation research: numerical versus visual approach, long versus short question format, and evaluation dimension. Norms are increasingly being used to set management standards in recreation in attempts to meet recreation management objectives, ensure visitor satisfaction and minimize conflict. This study uses data drawn from a multi-phase program of research on crowding on the carriage roads of Acadia National Park, Maine. The different norm-measurement techniques can yield significant differences in visitor norms. Use of multiple measures and multiple evaluation dimensions, such as preference, acceptability and management action, may be warranted. The study findings also suggest that commonly used norm-measurement approaches may lead to crowding-related standards of quality that are overly conservative.

81. Manning, R. E. 1999. "Carrying capacity: An organizational framework." In *Studies in Outdoor Recreation: Search and Research for Satisfaction*, Second Edition, 67-79. Corvallis: Oregon State University Press.

This chapter reviews the concept of carrying capacity as it has been applied to recreation studies. The concept has been expanded over time to include not only an emphasis on natural resource impacts, but to include equal consideration of recreation experience and management considerations. In this respect, the concept of carrying capacity in recreation management is applicable to understanding

recreation conflict. The author concludes that carrying capacity can be a useful concept in outdoor recreation management when viewed as an organizational framework. The concept of carrying capacity suggests that appropriate limits of acceptable change for visitor satisfaction or conflict need to be established. The carrying capacity of different recreation areas varies not only because of the inherent characteristics of the recreation area, but because of differences in management objectives, indicators and standards of quality.

82. Manning, R. E. 1999. "Indicators and standards of quality: A normative approach." In *Studies in Outdoor Recreation: Search and Research for Satisfaction*, Second Edition, 122-155. Corvallis: Oregon State University Press.

This chapter reviews indicators and standards of quality with a particular emphasis on personal norms. Personal norms are standards that individuals use to evaluate recreation conditions. The level of acceptable interaction with other recreationists is an example of a recreation-orientated norm. Personal norms can be aggregated to develop social norms and help set management indicators or standards of quality. While there are many issues associated with norms research and their application to recreation management, research has generally supported the notion that norms can be used to set valid management standards. Norms are reported more often, are more highly crystallized and tend to be less tolerant in wilderness and backcountry areas than in frontcountry or more highly used areas. Normative standards of quality of visitors may vary from those of managers. There is often a hierarchy of importance among indicators of quality.

83. Manning, R. E. 1999. "The Recreation Opportunity Spectrum: Designs for diversity." In *Studies in Outdoor Recreation: Search and Research for Satisfaction*, Second Edition, 176-193. Corvallis: Oregon State University Press.

This chapter presents the Recreation Opportunity Spectrum (ROS) which is a formalized recreation classification system. The ROS has been defined in a number of ways, but this chapter uses a seven class classification system: primitive, semi-primitive non-motorized, semi-primitive motorized, rustic, concentrated and modern urbanized. At its core the ROS is a conceptual framework for encouraging diversity in outdoor recreation opportunities. It also provides a framework for considering how to separate incompatible recreation uses and minimize conflict between these uses.

84. Manning, R., P. Newman, W. Valliere, B. Wang and S. Lawson. 2001. "Respondent self-assessment of research on crowding norms in outdoor recreation." *Journal of Leisure Research* 33(3): 251-271.

As norms are being increasingly used to set recreation management standards, it is important to ensure the validity of norms research. Borrowing techniques developed in contingent valuation, a battery of questions is used to measure respondent self-assessment of studies conducted in three U.S. National Parks. The results indicate that most respondents: 1) understand the questions being asked, 2) feel the photographs used in the studies realistically represent a range of use densities at the study sites, 3) are confident in their ability to report crowding norms, and 4) feel the National Park Service should use such data in formulating park management policy. Few differences in crowding norms are found between respondents who are confident in their answers and those who are less confident. These findings offer some support for the validity of measures of crowding norms in outdoor recreation. However, the issue of validity is complex and needs to be researched further in relation to recreation norms.

85. Manning, R., S. Lawson, P. Newman, D. Laven and W. Valliere. 2002. "Methodological issues in measuring crowding-related norms in outdoor recreation." *Leisure Sciences* 24(3-4): 339-348.

This study explores some of the theoretical and methodological issues with measuring visitor norms in recreations. Because there are theoretical and methodological similarities between research on recreation-related norms and contingent valuation, three methodological issues are identified for study from the contingent valuation literature: question format, starting point bias, and information bias. Using data from a study of crowding norms at Arches National Park in 1998 and the Grand Canyon National Park in 1997, the relationship between these methodological issues and crowding-related norms is studied. Few statistically or substantively significant differences in crowding-related norms are found to be associated with these methodological issues. Study findings suggest that measures of crowding-related norms may be relatively "robust," and this may add weight to the "validity" of the theory and methods associated with crowding-related norms in outdoor recreation.

86. Marcouiller, D. W. 2000. *The compatibility of timber production with forest-based recreation: Developing a basis for evaluating user conflicts*. Working Paper 00-01. Madison, WI: Department of Urban and Regional Planning, University of Wisconsin - Madison.

This paper develops a framework for assessing the compatibility of forest-based recreation with timber production. The interface between these two uses is examined using importance / performance and factor analysis as a basis for explanatory regression models of forest-based recreational user perceptions. Results suggest that forest use compatibility is dependent on the type of recreationist, their previous understanding of forest management effects, attitudes

toward land use regulations, concern for local economic conditions, and social-demographics characteristics. Whereas recreationists realize the importance of forest use to local development, there are distinct differences among forest-based recreationists in their support of timber management and related activities.

87. Marcouiller, D. W. and T. Mace. 1999. *Forests and regional development: Economic impacts of woodland use for recreation and timber in Wisconsin*. Madison, WI: University of Wisconsin Extension.

This study's primary objective was to research the economic impact of multiple uses of the Wisconsin's forests. Of particular relevance to issues of recreation conflict, was this study's use of importance-performance measures to investigate the compatibility of alternative forest uses. In general, the results suggest that recreational and timber production uses of the forest were compatible land uses. This was more likely to be true for hunters and motorized recreationists than with the broad category of "quiet" forest recreationists. The authors intent is to identify the relative compatibility of alternative forest uses, and they conclude that there are more compatibilities amongst forest use alternatives than there are incompatibilities. This runs counter to much traditional thought, both among academics and policymakers.

88. Moore, R. L. 1994. *Conflict on multiple-use trails: synthesis of the literature and state of practice*. Report No. FHWA-PD-94-031. Federal Highway Administration. <http://www.americantrails.org/resources/ManageMaintain/MooreConflictMgmt.html>.

This is a comprehensive literature review of recreation conflict, but with a particular emphasis on multiple use trails. This study emphasizes the "goal interference" model of conflict and finds that multiple-use trail managers are faced with three broad challenges: maintaining user safety, protecting natural resources, and providing high-quality user experiences. Much of the conflict literature has focused on the latter issue. The report discusses four categories of management response: physical design, information and education, user involvement, and regulations and enforcement. Finally, based on this review of the literature the report distills twelve principles for minimizing conflicts on multiple-use trails: 1) recognize conflict as goal interference; 2) provide adequate trail opportunities; 3) minimize number of contacts in problem areas; 4) involve users as early as possible; 5) understand user needs; 6) identify the actual sources of conflict; 7) work with affected users; 8) promote trail etiquette; 9) encourage positive interaction among different users; 10) favor "light-handed management"; 11) plan and act locally; and 12) monitor progress.

89. Patterson, M. E. and W. E. Hammitt. 1990. "Backcountry encounter norms, actual reported encounters, and their relationship to wilderness solitude." *Journal of Leisure Research* 22(3): 259-275.

This paper investigates backcountry backpackers' norms concerning maximum acceptable tolerance limits for visual-social contacts at three encounter sites - trailhead, trail and campsite. Similar to other studies on recreation norms, this study finds that while 83% of the respondents report encountering more parties than their acceptable norms, only 34% of the respondents report that the number of encounters detracted from their solitude experience. This common study finding is important for managers considering how norm-based management might relate to management of conflict in recreation. This study postulates four reasons for why they may have found this result in this study: many backcountry users do not have a clear or salient conception of what a tolerable number of encounters is; visual-social encounters are of only a minor importance in their whole experience; limitations in the measurement techniques in the study; and the number of encounters is important to respondents, but conformity of behavior to normative beliefs is not a certainty.

90. Peterson, G. L. 1974. "A comparison of the sentiments and perceptions of wilderness managers and canoeists in the boundary waters canoe area." *Journal of Leisure Research* 6(Summer): 194-206.

This study highlights an important aspect associated with conflict management: that recreation managers and recreational users may differ in their wilderness motivations, attitudes, preferences and perceptions. The study finds statistical differences in the way managers and canoers view a whole host of issues including: motivations for recreation, such as finding excitement, performance of management objectives, such as cleanliness, desirability of conditions, such as pristine nature or use of motors, appraisals of park conditions, such as impacts from recreational use, pleasantness of activities, such as having small children along, or general environmental disposition, such as inclination to wilderness as a way of life. Mostly, this study highlights the danger of setting recreation management goals based on management understandings and values as they are unlikely to meet user expectations. The study also highlights the need for education and opportunities for exchange of information so that users gain an appreciation of the management perspective while managers have a chance to understand user perceptions and values.

91. Roe, M. and J. Benson. 2001. "Planning for conflict resolution: Jet-ski use on the Northumberland coast." *Coastal Management* 29(1): 19-39.

The study takes a much different approach to most recreation conflict research in its examination of conflicts associated with personal watercraft (PWCs) on the Northumberland coastline. Instead of research focusing on conflict situations at a specific recreation site, this research uses a survey of 150 recreation interest groups and agencies to highlight specific issues with PWCs and comment on appropriate management actions. Management suggestions included legislation, voluntary agreements, zoning, control by clubs, physical barriers, and information and publicity. The results of the survey were used to develop a strategic framework that will act as a mechanism under which conflicts can be identified and resolved. The principles and approach that this study adopts illustrate a useful way to provide locally relevant proposals to deal with the dilemmas of managing "new wave" sports such as jet-skiing in ecologically sensitive and aesthetically important coastal landscapes.

92. Shelby, B. and T. A. Heberlein. 1986. *Carrying capacity in recreation settings*. Corvallis: Oregon State University Press.

This book develops a general conceptual framework for carrying capacity in recreation management and research. Social carrying capacity is viewed primarily as a way to merge research and management traditions concerned with establishing appropriate use levels in terms of both crowding and natural resource deterioration. Recreation conflict is often attributed to both of these dimensions: crowding and competition between different use types. The framework includes descriptive elements of use levels, evaluation of recreation systems, and management standards. The authors tackle the issue of the lack of correlation between crowding and satisfaction and density and perceived crowding, and conclude that normative standards offer more effective means for making capacity judgments. Setting capacity levels, however, does not solve the allocation issue. Nor does setting use-levels solve the question of the appropriate mix of recreational users and the authors present two basic allocation mechanisms.

93. Shelby, B. and J. J. Vaske. 1991. "Using normative data to develop evaluative standards for resource-management - A comment on 3 recent papers." *Journal of Leisure Research* 23(2): 173-187.

Social norms are increasingly being used to set recreation management goals and objectives, and are one tool for managing recreation conflict. Social norms are measured empirically by aggregating norms measured at the personal level. This paper reviews three studies that examine issues related to the measurement and definition of management norms, and offers comments on the issues they raise. Two of the studies find that norms are not a useful criterion for managing overall satisfaction of the visitor experience, but that norms are likely quite useful for setting management standards. The third study highlights a number of issues with

norms including the fact that they are likely to exist more in low-encounter activities and the challenge of identifying a consensus or acceptable level of norm agreement. Using norms as evaluative management standards is a relatively new approach, and this paper's author highlights the importance of not confusing the process of resolving theoretical and methodological issues with the acceptability of this technique to management.

94. Shelby, B., J. Vaske and M. Donnelly. 1996. "Norms, standards, and natural resources." *Leisure Sciences* 18(2): 103-123.

The article reviews the "normative approach" to recreation management and managing recreation areas based on individuals' personal norms. The article reviews norms that have been measured for peoples' acceptance of different characteristics such as number of people encountered, people engaged in different activities, amount of litter, noise levels, services provided, instream flow, and ecological impacts. Norms can vary considerably depending on a number of factors including activity types, activity setting or motivation for engaging in the activity. Norms are increasingly being used in resource management to help set management direction, to define the salient characteristics of high quality settings, to define standards that can be used as management targets, to differentiate minimal conditions from optimal conditions, to identify important impacts about which people feel more strongly, and to indicate the degree of consensus among various interest groups. The article also reviews some of the important considerations in norms research. Finally, the authors conclude that the normative approach is an interesting study of the symbiosis between science and management and, in particular, with science providing valuable information to managers making decisions on how things "should be" in recreation areas.

95. Stankey, G. H. and S. F. McCool. 1984. "Carrying capacity in recreational settings: Evolution, appraisal, and application." *Leisure Sciences* 6(4): 453-473.

This article reviews the literature on the carrying capacity concept and its application to recreation management. Written largely as a defense of the carrying capacity construct, it argues that essential elements of the carrying capacity were recognized early including: 1) recreationists seek multiple satisfactions from recreation and, depending upon these, encounters with others might add, detract, or be neutral in their effect on those experiences; 2) satisfaction is a function of more than use level - the type, frequency, and location of encounters are important intervening variables; 3) clearly stated objectives are essential to identifying carrying capacities; and 4) the emphasis in management needs to be on the outputs - the experiential and environmental conditions desired - not on the inputs such as use levels. The article reviews critically the research on the relationship, or lack of one, between overall satisfaction and number of

encounters. The authors speculate that a number of mediating factors at play include: 1) self-selected nature of recreation participation; 2) shifts in clientele and experience definition; 3) multiple influences on satisfaction; 4) how satisfaction is defined and measured; 5) saliency of use levels; and 6) the role of expectations and preferences. The article concludes that management focus should not be on "how much is too much", but instead on what kinds of conditions are appropriate and acceptable in different settings. They propose a "limits of acceptable change" as a management framework.

96. van Kooten, G. C. 1993. "Management of Public Lands for Multiple Use." In *Land Resource Economics and Sustainable Development: Economic Policies and the Common Good*, 363-391. Vancouver: UBC Press.

This book provides an introduction to issues of land use and the economic tools that can be used to resolve land-use conflicts. This particular chapter focuses on the issue of multiple use management of public lands. It provides an historical account of public land management in North America and looks at the province of British Columbia as a particular case study. The conflicts between domestic and wildlife grazing, and between timber production and grazing, are used as an example to illustrate the economic transformation functions of alternative land uses. With land uses considered as outputs produced by the land resource, alternative land uses are (1) competitive (2) complementary (3) supplementary and (4) antagonistic. Given this economic framework the optimal use of public lands can be determined. For example, one study in Arizona analyzed the trade-off between hunting values and domestic grazing. The researchers concluded that the marginal value for producing elk is more valuable than the marginal value for producing cattle and that the cattle and elk numbers were far from an economically efficient equilibrium. Theoretically, this procedure could be applied to many different problems including recreation conflicts. However, the method is fraught with many challenging including appropriate valuation of resources and development of transformation functions.

97. Vaske, J. J., A. R. Graefe, B. Shelby and T. A. Heberlein. 1986. "Backcountry encounter norms - theory, method and empirical-evidence." *Journal of Leisure Research* 18(3): 137-153.

This article provides a conceptual framework for analyzing the structural characteristics of norms. In particular the relationship between social norms, which are standards shared by the members of a social group, and personal norms, which are standards held by the individual, does not show perfect symmetry. While personal norms are usually quite close to the social norms, they may in some cases be quite different. The return potential model is a graphed relationship between a behavioral dimension, such as number of encounters with other people during a

recreation activity, and an evaluation dimension, using some measure of acceptability, pleasantness or favorability. In the outdoor recreation, the model for encounters is depicted as a downward sloping curve from zero encounters being most acceptable to many encounters being least acceptable. The model is, in essence, an illustration of the social norm. Two structural properties of the model, norm intensity and norm crystallization, can be measured empirically. Norm intensity is the height of the return potential curve both above and below the point of indifference. Norm crystallization is the amount of agreement about the norm, or a measure of standard deviation at each point along the curve.

98. Whittaker, D. and B. Shelby. 1988. "Types of norms for recreation Impacts - Extending the social norms concept." *Journal of Leisure Research* 20(4): 261-273.

Social norm theory suggests there may be group agreement about appropriate conditions for outdoor recreation areas. If managers can identify appropriate social norms, management standards can be set that assist in satisfying user expectations and limiting potential conflict. This study investigates various social norms for boating standards for a variety of social and ecological impacts on the Deschutes River in Oregon. Survey respondents were asked to rate a total of eleven impacts and the 460 respondents represented such user groups as trout fishing, whitewater floating, riverside camping, whitewater floating, car camping, steelhead fishing and jet boating. Results of the survey indicate that there were three different social norms types - "no tolerance", "single tolerance", and "multiple tolerances." For example, approximately 80% of people report that it is never appropriate to see signs of human waste. In terms of on-river encounters, this measure represents a "single tolerance" norm with people willing to tolerate a certain level of impact, but few people willing to tolerate uses beyond a certain level. Finally, peoples' norms for fire rings demonstrated bi-modal distribution with many users not wanting to see any evidence of fire rings, but with another sizable percent of users willing to see fire rings at every campsite.

Economic Valuation and Recreation Conflict

99. Clawson, M. and J. L. Knetsch. 1966. "The values of land and water resources when used for recreation." In *Economics of Outdoor Recreation*, 211-229. Washington: John Hopkins Press.

This chapter is an oft cited in research that attempts to value land or water for recreation. In particular, this text helped to stimulate a great interest in the use of the travel cost method in recreation research. The travel cost method uses the cost of visitor travel to a recreation site and the total number of visitor coming from different areas to build a demand curve for recreation at that site. The total

economic benefit of recreation is the area under the demand curve. The chapter also reviews other methods for estimating the economic value of recreation areas.

100. Duffield, J. W., T. C. Brown and S. D. Allen. 1994. "Economic value of instream flow in Montana's Big Hole and Bitterroot Rivers." *USDA Forest Service Research Paper* RM-317.

This study examines both the economic value of recreation and preservation uses of instream flows, such as river flows for fishing, boating, ecosystem stability or habitat provision, using dichotomous-choice and open-ended contingent valuation surveys. The marginal recreation value per acre-foot at low-flow levels is found to be in the \$10 to \$25 range. The preservation value is found to be in the \$25-\$35 range. A new method was introduced based on the application of Euler's Theorem, to identify the share of total value attributable to each motive. Approximately 75% of total valuation is associated with existence rather than use motives. Of the two rivers surveyed, the value of the instream flow is higher than the agricultural value of the water at all times on one river (the Big Hole) and only during moderate to low flow conditions on the other (the Bitterroot). This type of information is helpful to policy makers as they make decisions regarding appropriate flow levels when conflicts arise between different uses of instream river flows.

101. Forster, B. A. 1989. "Valuing outdoor recreational activity: A methodological survey." *Journal of Leisure Research* 21(2): 181-201.

This paper surveys the economic literature relevant to the monetary valuation of outdoor recreational activity. Determining economic efficient allocation of recreational resources is one way for economists to contribute positively to solving recreation conflicts. The paper examines issues that arise in the design and application of the travel cost method, the contingent valuation method and the hedonic pricing method of valuing outdoor recreation activity. The most commonly used methods are the travel cost method (TCM) and contingent valuation method (CVM) with hedonic property value method being a possible but seldom used approach. The choice of method is often determined by the problem at hand and whether there is variability in travel costs. Wherever possible a combination of CVM and TCM elements in a study is preferred in order to validate results.

102. Hatch, L. U. and T. R. Hanson. 2001. "Change and conflict in land and water use: Resource valuation in conflict resolution among competing users." *Journal of Agricultural and Applied Economics* 33(2): 297-306.

This paper focuses on the economic methods that can be used to help resolve water allocation conflicts. Lakefront property owners and recreational users were

surveyed to find out how changes in water level would affect landowners' property values and recreational visitation and expenses. Potential reservoir users were surveyed to determine their willingness to pay for preservation of the current reservoir resources. The survey illustrates a large economic impact for water level changes on recreational users. This type of research provides decision makers with important information about what is being gained or lost when these decisions are being made.

103. Loomis, J. B. 1987. "The economic value of instream flow: methodology and benefit." *Journal of Environmental Management* 24: 169-179.

This paper examines the research on the economic benefits of instream flow, an important resource for a diverse range of recreation activities, wildlife preservation and fisheries. Techniques for estimating the economic efficiency benefits of non-marketed resources, such as contingent valuation and the travel cost method, have been used by researchers to establish relationships between instream flow levels and benefits. The marginal values of instream flow vary significantly with level of flow, and values range from \$0.50 to \$74 per acre-foot. However, most studies evaluated reported annual values between \$14 and \$27 per acre-foot. The value of the water for instream flow depends on a number of factors, such as the amount of water or the timing of water availability. For some rivers, at about 30% of peak flows the instream flow values are equal to or greater than the irrigation values. For other rivers, minimum flows necessary for the survival of fish may be the economically optimum levels of instream flows. For rivers that are popular recreation destinations, optimum flow levels may be substantially higher.

104. Matulich, S. C., W. G. Workman and A. Jubenville. 1987. "Recreation economics: taking stock." *Land Economics*.

This article looks at the state of recreation economics in 1987 and concludes that there is not enough work focused on the allocation of resources - the supply side. Much of the work in recreation economics has focused on refining the methodological issues associated with non-market valuation, but there are few examples of studies on supply-related phenomena. They conclude that the outdoor recreation economics is welfare economics in action with the task of providing the public sector better information about the allocation of recreational resources. Recreation economics will not be able to complete this task, nor contribute to solving recreation conflicts, without more of a focus on the supply side.

105. Narayanan, R. 1986. "Evaluation of recreation benefits of instream flows." *Journal of Leisure Research* 18(2): 116-128.

Instream uses, such as recreation, hydropower, navigation, waste transport, fish and wildlife maintenance and preservation of river ecosystems, compete for water use with uses requiring offstream diversions. While proposals for instream flow protection have recognized the importance of these instream uses, debate still exists about the relative value of these uses as compared to diversionary uses. A methodology to estimate instream flow benefits is proposed in this study. Using the travel cost approach, demand for recreation is first estimated. Surveys are then used to estimate changes in visitation corresponding to alternate levels of stream flows. Based on these results, instream flow benefits are then calculated, using a weak complementarity assumption. This study is an example of an early instream flow study and it finds a relatively low marginal instream flow benefit of \$0.42 per acre foot. However, this study is considering the instream benefits of recreation only.

106. Sanders, L. D., R. G. Walsh and J. B. Loomis. 1990. "Toward empirical estimation of the total value of protecting rivers." *Water Resources Research* 26(7): 1345-1357.

Increasingly, conflicts exist between those looking to preserve rivers and river flows for environmental and recreational benefits and those looking to use rivers for extractive purpose. Determining the economic value of these resources for recreational and environmental conservation purposes is an important component of working to solve these conflicts. The purpose of this paper was to develop and apply a procedure to estimate a statistical demand function for the protection of rivers in the Rocky Mountains of Colorado. The study found that the total value of rivers include important preservation benefits. A sample of the general population of the state reports a willingness to pay for preservation benefits. Inclusion of preservation benefits in state and federal guidelines for benefit-cost analysis would improve the efficiency of river allocation and increase the welfare to society.

107. van Kooten, G. C. and E. H. Bulte. 1999. "How much primary coastal temperate rain forest should society retain? Carbon uptake, recreation, and other values." *Canadian Journal of Forest Research* 29: 1879-1890.

This study compares the average and marginal approaches for determining optimal preservation of primary forests. When the market values of various forest harvesting activities, such as timber production or mushroom picking, are compared to the non-market benefits, such as carbon sequestration, recreation or preservation, of preserving old-growth forests, the average method recommends harvest of all remaining old growth. In contrast, the marginal approach indicates that large-scale conversion of old-growth forests cannot be justified on economic grounds. The author concludes that despite advances in environmental economics and techniques for valuing non-market amenities, much theoretical and empirical

work remains to be done before enough information is available to provide a strong economic answer resource questions of intense conflict, such as the one posed in this paper.