United States
Department of
Agriculture

Forest Service

**Northeastern Forest
Experiment Station**

General Technical
Report NE-218
1996

Proceedings of the 1995 Northeastern Recreation Research Symposium

**April 9-11, 1995
Saratoga Springs, New York**

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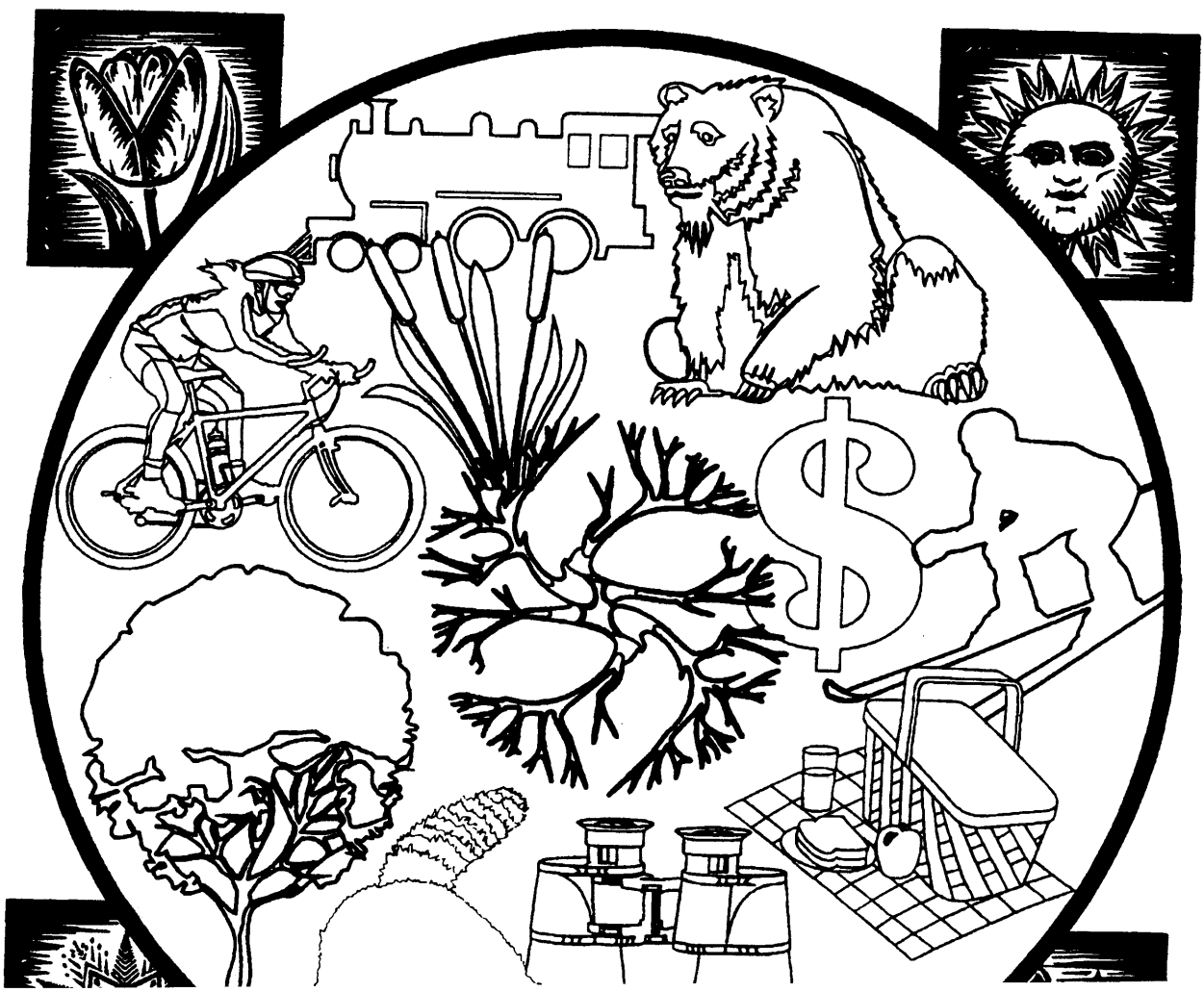

Aldo Leopold Wilderness Research Institute: Publication # 278
CITATION: Watson, Alan; Zaglauer, Hans; Stewart, Susan. 1996. Activity orientation as a discriminant variable in recreation conflict research. In: Dawson, Chad P., comp. 1996. Proceedings of the 1995 Northeastern Recreation Research Symposium; 1995 April 9-11; Saratoga Springs, NY. Gen. Tech. Rep. NE-218. Radnor, PA: U.S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station: 103-108.

ACTIVITY ORIENTATION AS A DISCRIMINANT VARIABLE IN RECREATION CONFLICT RESEARCH

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The validity of previously used dichotomous measures of activity participation is examined in relation to an index measure incorporating an assessment of cross-activity participation and intensity of involvement in each activity. Not only is this type of orientation measure important to future conflict research, providing a more accurate depiction of the groups in conflict and a more precise opportunity to study contributors to conflict, but the development of more accurate orientation measures may contribute to other types of recreation attitudinal research as well.

Current Research Topics on Conflict

There has been a renewed interest in recreation conflict research in recent years (Williams 1993). Since 1989, scientists at the Leopold Institute (an inter-agency wilderness management research unit), university cooperators, and others have been involved in a variety of methodology development and application activities dealing with recreational conflict on wildlands. Current research efforts center on 5 important topics.

Alternative Theoretical Approaches

Jacob and Schreyer (1980) suggested a goal interference framework for defining interpersonal conflict and proposing potential contributors to feelings of conflict. This theoretical framework has persisted as a basis of understanding conflict, even though conflict itself and the potential contributors have not been measured in a consistent way. The model itself has only recently been tested in a comprehensive way (Watson, Niccolucci and Williams 1993, 1994). Recently, efforts to expand this framework through incorporating a normative component (Ruddell and Gramann 1994; Gibbons and Ruddell in press) promises further refinement of this expanded model. Alternatively, there are efforts to develop different approaches to studying recreational conflict, such as the extensive review of social conflict (versus interpersonal conflict) literature by Kajala (1994). There remains a dilemma associated with the difficulty in assessing recreational conflict at the group or subpopulation level, but this is a viable research problem that will soon be addressed.

Contributors to Conflict

Some of the potential contributors to conflict proposed by Jacob and Schreyer (1980) have transitioned as these concepts have been explored and efforts have occurred to relate these various items to conflict measures. These factors typically include mode of experience, place attachment, lifestyle tolerance, and activity specialization (Watson et al. 1993). Some variables slightly outside these proposed contributors have been explored independently and as part of model testing. For instance, Watson and Niccolucci (1993) explored the contribution of place of residence (urban vs rural) to understanding conflict reports.

Effectiveness of Management Interventions

Based on research to understand the contributors to conflict, suggestions have surfaced on how to manage conflict among recreation visitors. For instance, alternative approaches have been proposed to address conflict between hikers and recreational stock users (Watson et al. 1993). Some conflict reports can be traced to behaviors of stock users that could be influenced through education of stock users about the effects of these behaviors, or by subtle changes in facilities or suggested behaviors. There is an additional element of conflict that is more related to perceptions of appropriateness of horses and their impacts in wilderness. It has been suggested that more dicsussion about the cultural significance of horses in European settlement and Native American society may lessen some conflict feelings. It is believed, however, that some visitors would never accept horses and their impacts in places they recreate, and therefore nothing short of separation of uses would alleviate these feelings of conflict. It is a minority that this action would be required for, but if this is the managment goal, it should be effective. No objective evaluations of these potential solutions have been performed. Only recently has a research study been designed specifically to establish baseline conditions, monitor trends in conflict, and assess the success of management applications to influence conflict levels. This research deals with bicycle conflict management and is sponsored jointly by Adventure Cycling, the Lolo National Forest, Recreation Equipment Incorporated and the Leopold Institute.

Obtrusiveness of Management Interventions

Most recreation conflict research has focussed on determining the amount of conflict expressed by one group toward another, most often an asymmetrical conflict situation, where only one group is expressing conflict. The assumption in this research is that if the conflict is understood some actions can be taken to change behaviors or attitudes that will reduce these conflict feelings. Currently, a project is underway to assess the impacts

of various proposed methods of reducing conflict on the quality of recreation experiences for those thought of as causing the conflict. We are using the term obtrusiveness to indicate the negative emotional response visitors attribute to actions initiated by management. We believe that this impact on legitimate users of the resource must be taken into consideration in all efforts to manage conflict.

Measurement Methods

In initiating new emphasis on conflict research, one basic step involved re-examining how conflict has been measured in the past. There was, in fact, several ways it has been measured. One real need is to obtain some agreement on what the primary indicator of conflict should be. There has been a tendency to use measures more associated with attraction theory than conflict theory, and only recently have we moved to more conflict theory-based measures (Watson et al. 1994; Kajala 1994; Ruddell and Gramann 1994). Additionally, refinement of measurement of the potential contributors to conflict is a continual evolving process. New theoretical approaches are leading to newly introduced measurement challenges. Where interpersonal conflict models required improved measurement of personal meanings assigned to places and activities, social conflict approaches suggest the need for not only new measures of social conflict, but also the hypothesized determinants of social conflict, such as the social meanings related to a place, an aspect of the resource, or the activity. The other measurement method of interest currently is the challenge of analysis. We have moved beyond descriptive studies of conflict amount and characteristics of the conflict groups to more sophisticated predictive procedures that relate the contributors to actual conflict reports.

While all of these issues are important and ongoing research topics in recreation conflict, this paper is about one specific problem with measurement and analysis methods. The problem centers around how we classify visitors in recreation conflict studies. Classification of visitors into erroneous conflict groups can hinder our ability to achieve understanding of conflict and its determinants.

Problem With Classification of Visitors

In past recreation conflict research, conflict groups were typically defined based upon the activity individuals participated in on one specific visit to a place. This has been the case in even the most recent studies with little exception. Watson, Williams and Daigle (1991) studied conflict between those who were hiking when they were surveyed, and those who were bicycling when they were surveyed. Watson et al. (1993, 1994) separated groups based upon whether they were hiking or using recreational packstock at the place and time of surveys in Indiana and California. In the past we have seen the same classification method applied to canoeists and power boaters, to skiers and snowboarders, and to walkers, runners, skaters and bicyclists in various studies.

There are two basic problems with this past tendency. Previous research of this kind suggests that many visitors do not strongly identify with only one of the study groups. It appears that the strength of identification with a single group may vary by activitities investigated. For instance, there appears to be substantial overlap between hiking and mountain biking. Mountain bikers also participate in hiking quite often. Hikers may be mountain bikers on other occasions. Hikers and recreation packstock users or skiers and snowmobilers, however, may overlap much less. There is the possibility that visitors are not members of a single group to the extent that we have assumed. This suggests more complex measures of crossover participation will enhance our understanding of reported conflict. Second, recreation conflict research has evolved to incorporation of cumulative measures of conflict, and the most commonly tested contributors to conflict represent cumulative attitudes and perceptions of other groups. Use of these cumulative measures of both dependent and independent variables seems incompatible with the tendency to then discriminate between groups to which we apply the analysis based upon participation in an activity during a single outing. Much as visitors commonly participate in a cluster of activities during a single trip (Daigle, Watson and Haas 1994), they quite likely participate in a cluster of activities over a period of time. Attitudes of visitors toward participants in other activities may be influenced by their own involvement in these other activities.

Methods

A research project aimed at monitoring conflict between hikers and mountain bike riders in the Rattlesnake National Recreation Area provided the opportunity to develop an improved method of classification of visitors for conflict analysis. Conflict between these two groups was initially studied in 1989 (Watson et al. 1991) at this location. The Rattlesnake National Recreation Area contains about 61,000 acres, with the northern, more remote half protected as wilderness. Two major access points provide the majority of use to the area, and both are served by the same access road with parking only slightly separated. It is easy to make contact with visitors entering or exiting the Rattlesnake along old access roads which provide initial access. The Rattlesnake serves the community of Missoula, on the Lolo National Forest, in Western Montana. Missoula is a mixed community of university services, timber industry and tourism businesses. The Rattlesnake use comes almost entirely from Missoula, some of it quite casual, short-term use, with the majority hiking or mountain biking.

During the summer and fall of 1994, a visitor survey was conducted at the two major trailheads to the Rattlesnake. Sampling replicated days and times from the 1989 sample. In the earlier baseline conflict study, random blocks of days were selected, and for each sample day one of the two access points was randomly assigned for visitor surveying. As visitors exited during a six-hour sample day (randomly selected from three possible 6-hour blocks) each group was asked to provide some basic trip information and if they would be willing to participate in a mailback survey dealing with their perceptions of conditions in the Rattlesnake. Each visitor who agreed to

receive the questionnaire (up to 4 visitors per group) was sent an 8-page survey form, intended to provide basic information on conflict feelings and relevant trip data. A follow-up postcard and a maximum of two replacement mailings of the survey provided a response rate of 71%, 1054 usable questionnaires.

The survey was partly a replication of the study done in 1989, in an effort to document changes in conflict levels and serve as a baseline for evaluation of management actions in the future. The portions most relevant to this report included an indication of what activities visitors participated in on this trip, what they had done on previous trips to the Rattlesnake, and the number of times they had done each activity in the Rattlesnake during the last 12 months. Activities listed included bicycling, hiking on trails, and hiking off of trails. From these measures of trip-specific and past activity participation at this one place, an index to orientation toward the two primary activities (hiking and mountain biking) was developed.

Two groups were defined that closely resembled those of other recreation conflict studies. One of these was the hikers. These people had never bicycled in the Rattlesnake. They didn't bicycle on this trip, and they indicated they had never bicycled in the Rattlesnake. A second group consisted of bikers. They had biked in the Rattlesnake but had never hiked there. The other two groups developed from these activity participation variables included one group that had both hiked and biked, on this trip or previous trips, but had hiked more times than they had biked during the last 12 months (introducing an intensity measure to discriminate between categories of visitors) and one group that had both hiked and biked in the Rattlesnake but had biked more times during the past 12 months than they had hiked. Of the original 1054 cases, 924 could be classified in this manner. The rest were either horse riders who used the Rattlesnake for only that purpose or they had hiked and biked with equal intensity during the past 12 months. For the analysis reported here, those who did not fit this four-category classification were dropped. A fifth category of the equal intensity people may be a valuable group to include in future analysis.

A measure of conflict used in the earlier study asked visitors if they enjoyed, disliked or didn't mind meeting each of several different kinds of recreation groups during their visits to the Rattlesnake. They could also indicate they had never met any of a particular type of group. Each person was also asked how big a problem he or she perceived each of several types of visitor behaviors was during the specific trip when they were surveyed. Included in these items were "too many hikers," "too many bicyclists," and "bicycles traveling too fast." The strength of the problem was measured on a scale from "no problem" to "small problem," "moderate problem," and "big problem." "Don't know" was also a possible response. One last set of items included in the analysis reported here was a visitor report of how much various things influence the quality of recreation experiences in the Rattlesnake. "The number of hiking groups seen along the trail" and "the number of bicycles seen along the trail" were among the items evaluated on a 6-point scale from "not at all" to influencing "an extreme amount."

Results

A very simple test of the value of this more cumulative measure of activity orientation over a simple single-trip participation measure is a comparison of the two measures for this sample (Table 1). For the 924 visitors who could be classified on the more cumulative measure, 56 percent were involved in a hiking visit and 42 percent were biking. The amount of crossover in activity participation, and thus orientation toward the two activities, is evident from the cumulative measure: 19 percent had only biked in the Rattlesnake, 36 percent had only hiked, and 46 percent had done both (26 percent more intensive bikers, 20 percent more intensive hikers). This simple comparison illustrates that using the traditional method of classification would lead to 46 percent of those inlcuded in any kind of predictive analysis based upon cumulative measures of conflict and cumulative indications of attitudes toward the other groups would be misclassified.

Table 1. Visitor classification, Rattlesnake National Recreation Area - 1994.

Activity Participation on this trip	**Percent**
Biked on this trip	42
Hiked on this trip	56
Orientation toward the activity	**Percent**
Strict biking orientation	19
Strong biking orientation, but hikes	26
Strong hiking orientation, but bikes	20
Strict hiking orientation	36

The purpose of much of the conflict research has been to assess the amount of conflict that is occurring. A second simple test of the value of this more cumulative measure of group orientation is to see if any additional insight is gained from examining conflict reports for the four categories of activity orientation (Table 2). For this sample, the primary conflict report came from those hiking on the trip when interviewed. Twenty-one percent indicated they disliked encounters with bicycle riders, 79 percent either enjoyed meeting them or didn't mind meeting them. This 21 percent was not evenly distributed across those who have a strict hiker orientation to the place and those who participate in both hiking and biking. The conflict for strict hikers is exactly twice the level of those who participate in both activities but most intensively participate in hiking. So, the most intense conflict exists for this identifiable group within the hikers, those who have never bicycled at this place.

Table 2. Conflict measures by activity group, Rattlesnake National Recreation Area - 1994.

	No Conflict Percent	Conflict Percent
Activity participation on this trip		
Biked on this trip (conflict with hikers)	98	2
Hiked on this trip (conflict with bikers)	79	21
Orientation toward the activity		
Strict biking orientation (conflict w/hikers)	98	2
Strong biking orientation, but hikes (conflict w/hikers)	99	1
Strong hiking orientation, but bikes (conflict w/bikers)	86	14
Strict hiking orientation (conflict w/bikers)	72	28

Analysis of the question that asked how much of a problem too many hikers, too many bikers, or bicycles traveling too fast was on this visit revealed very different responses for all four groups (Table 3). The four groups reported significantly different levels of problems (ANOVA, P<.05). Those who only hiked evaluated bikers as a greater problem than did those hikers who had also biked. Interestingly, those bikers who had also hiked reported hikers to be more of a problem than the strict bikers did. Nearly the same pattern emerged when asked about factors that influenced the quality of recreation experiences in the Rattlesnake (Table 4). Strict hikers were influenced significantly more by biker encounters than were those who both bike and hike. The two groups who demonstrated crossover in activities did not evaluate each other at different levels, but strict bikers did evaluate hikers as less of an influence than either hiker group evaluated bikers. The typical asymmetrical relationship holds for this type of evaluation of each other as well as in simple conflict measures.

Implications

While this study does not include complex modelling using these new categories of activity orientation, this simple, exploratory analysis suggests the values associated with more careful measurement of activity orientation in future studies. The implications of these findings can be summarized in five ways.

Understanding of Past Research Findings

Watson et al. (1991) found significant differences between hikers and bikers in the earlier study at the Rattlesnake, but speculated that some of the strength of the differences was clouded by lack of accurate perceptions of activity orientation. They speculated that more bikers were also hikers than hikers were bikers, and this difference in crossover extent was important to understanding the conflict between these two groups. In fact, that is exactly what these newer data show. There is a need to acknowledge that there is often crossover between the groups being studied and this crossover needs to be assessed and entered into the analysis. In studies of hikers and recreational stock users by Watson et al. (1993, 1994), it was not considered that some subjects who were hiking at the time of the study may have previously been stock users in the area, and some stock users may have been hikers. Definition of groups in a way that acknowledges this crossover would likely lead to greater understanding of the contributors to conflict achieved by subsequent analysis.

Table 3. Visitor evaluations of strength of problems (1=no problem, 4=big problem), Rattlesnake National Recreation Area, 1994.

Orientation toward the activity	Problem	Score	Significant differences*
Strict biking orientation	Too many hikers	1.37	A
Strong biking orientation, but hikes	Too many hikers	1.69	B
Strong hiking orientation, but bikes	Too many bikers	2.44	C
Strict hiking orientation	Too many bikers	2.61	D

*Scores with different letters indicate significant differences (ANOVA, p<.05)

Table 4. Visitor evaluations of encounters (1=no influence, 6=extreme influence) with other groups, Rattlesnake National Recreation Area, 1994.

Orientation toward the activity	Encounter evaluated	Score	Significant differences*		
Strict biking orientation	Hikers	3.43	A		
Strong biking orientation, but hikes	Hikers	3.67	A	B	
Strong hiking orientation, but bikes	Bikers	3.81		B	
Strict hiking orientation	Bikers	4.19			C

*Scores with different letters indicate significant differences (ANOVA, p<.05)

Influence on Future Measurement of Discriminant Variables
While this type of more thoughtful measurement of orientation in recreation conflict research appears a likely change in future studies, the same considerations in other conflict research seems justified. There is a need for studying social conflict in communities dependent or in close interaction with national forests. Some of the factors potentially contributing to the conflict are directly related to the measure of group orientation, the assumed indicator of different values. For instance, in many communities there are people who have lived in the area for a long length of time. These permanent residents have developed a relationship with the land over several generations. Also present in these communities may be seasonal home owners, newly retired arrivals, and new residents from different geographic, and possibly different cultural, orientations. These groups may differ in basic attitudes toward the natural resources in which they interact. One discriminat variable that comes to mind very readily is the rurality (Willits, Bealer and Timbers 1990) of values each group may be expected to have. Previous conflict research suggests that whether a person lives or was raised in an urban or a rural location may influence some conflict situations (Watson and Niccolucci 1993). The research reported here cautions us from merely classifying people as urban or rural, however, suggesting instead that there are multiple levels of orientation that need to be defined and used in the analysis. Rural residents, seasonal home owners, retirees, new arrivals, as well as week-end visitors to an area may vary greatly in this single orientation in values.

Increase Success of Discriminant Analysis
While the re-analysis of previously reported conflict studies has not occurred at this time, the implications of the findings reported here is that if re-analysis was conducted the differences between the four groups as defined by the more cumulative measure of activity orientation would be sufficient enough to influence statistical models used to classify subjects. If the group identified as only hiking at the place is isolated from those who crossover activities, it is hypothesized that an even more successful discriminant model would develop. Whether different variables would surface to explain the conflict is difficult to foresee, but it is possible, making previous conflict analyis results subject to re-examination.

Suggests Need to More Accurately Measure Orientation
This really simple attempt to explore the crossover between activities and reflect it in a discriminant variable, only opens the door to more advanced methods. In future recreation conflict research, there is a need for thought at the planning stage about how orientation will be measured. In a current study at the Leopold Institute, the method reported here is being compared to a visitor self-report of orientation toward the subject activity groups. It seems worthwhile to determine if objective, index measures such as used here are related to the visitor's own perception of how strongly he or she identifies with the particular groups in conflict. There are other methods of measuring orientation and involvement of recreation visitors (for instance see Williams, Patterson, Roggenbuck and Watson 1993) that would give continuous measures of identity strength for those types of analyses where this type of measurement scale is needed.

Helps Managers Understand Visitor Character
Maybe most importantly this type of categorization of visitors helps managers understand conflict situations better. The results reported here leads us to acknowledge that people are not clearly divided into hikers and bikers at the Rattlesnake National Recreation Area. People can be both, and they bring these past experiences and orientation toward the place to public meetings, personal visits to the District Ranger's office, and in encounters with others on the resource. Understanding that there is a group that only hikes in the Rattlesnake, and they are much more negative about interactions with bicyclists than some other hikers who also bike there, gives management a greater chance of correctly developing management solutions. This analysis demonstrates that there is greater polarization on this conflict issue than initially suggested, with the greatest negative perceptions of bicycle use consistently expressed by a single group of visitors. Previously, inclusion of all hikers in a group, regardless of whether they had biked before or not, masked the depth of feelings for the hiker only group.

Acknowledgements
The authors acknowledge Recreation Equipment Incorporated, Seattle, WA; the Lolo National Forest, Missoula, MT; and Adventure Cycling, Missoula, MT, as co-sponsors of the research reported here.

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