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# The Contribution of Research to Managing Conflict Among National Forest Users

*by Alan Watson, Ph.D., Charles Asp, James Walsh, Ph.D., and Andy Kulla*

At this time, there is not a tremendous volume of published research on the conflict between hikers and mountain bike riders. Though it is an important topic, it is also a relatively new area of confrontation in recreation areas. In many places, mountain bikes are considered nontraditional, invasive of space previously frequented by only hikers or horse riders. Attention to this conflict is increasing. At other places, mountain bike use is being invited with open arms to places considered under utilized by any outdoor interests during certain times of the year.

Representatives from Forest Service Research, faculty and students at The University of Montana, Adventure Cycling (a membership organization), and National Forest System managers in the Missoula, Montana, area have teamed up to study the issue of conflict regarding mountain bike use at the Rattlesnake National Recreation Area just outside Missoula. With initial study beginning in 1989, this affiliation provides a longitudinal basis for examination of the problem and potential solutions. The involvement of so many factions provides a good case study to see just how research can contribute to managing this type of conflict. Such an examination may serve to stimulate more knowledge development about the issues involved.

Photo: Alan Watson

*The degree management techniques actually impact visitor experiences has not previously been measured.*

An initial study in 1989 provided some baseline information about users and user conflicts at the Rattlesnake National Recreation Area and provided management with some ideas about strategies they should consider in addressing conflict. The earlier study also stimulated team members to ask more complex questions than the original study was designed to address. Continued involvement provided an opportunity to explore some of these questions, and the team was able to address concerns about how different management approaches might influence visitor experiences. Replication of the 1989 study in 1994 and a laboratory study to gain the insight of local community members provided trend information, greater understanding of conflict issues, and desirability of management alternatives.

## What Questions Can Research Address?

**Extent of conflict.** One of the basic information needs of managers, or anyone else sitting down to the table to work out potential solutions to a conflict problem, is to know how pervasive the problem is at that place. Some managers receive letters, phone calls, comments in private conversations, and public comments that can be taken as indications of feelings of conflict. For both immediate decision making and for long term monitoring purposes, however, knowing the actual extent of conflict is vital. At the Rattlesnake National Recreation Area,

Photos: Alan Watson

*At places where mountain biking, hiking and horse riding occur at the same place, management sometimes has to take actions to reduce conflict.*

a mailback questionnaire survey of a sample of visitors at the primary entrance point in 1989, produced an estimate that 30 percent of the hikers who encountered bicycles during their visit disliked those encounters. We also learned that only 6 percent had not met bicycles during their visits. This could have been by chance or by intent, we don't know. Only 3 percent of bikers disliked their encounters with hikers. This type of asymmetric conflict relationship is common in recreation. The increased understanding of who is expressing conflict and what proportion of the total population of visitors is in conflict helps managers prioritize issues and provides the opportunity to establish objectives of potential solutions.

**Trends in conflict.** In 1994, a sample using similar procedures from the 1989 study produced nearly 1000 responses, of which 21 percent of the hikers indicated conflict with mountain bikes during the visit. Again, only about 3 percent of bikers had unpleasurable experiences meeting hikers. It also appeared that (a) overall use had increased substantially from 1989 to 1994, (b) the proportion of hikers and mountain bikers had remained relatively stable at about 50 percent each, and (c) some efforts management had taken to control conflict since 1989 had at least been partially successful. There is the fear, however, that the reduction in conflict may indicate that some of those in conflict had been displaced; they may have stopped going to the Rattlesnake National Recreation Area due to the conflict experienced there. In any case, accurate knowledge about how many and who are in conflict, as well as the conflict trend is vital to evaluation of any action alternative management chooses, even a no-action alternative.

In this second study there were some basic questions that the research team had as a follow-up to results of the earlier study. For instance, there was concern expressed about simply classifying every visitor as either a hiker or bicycle rider based on each person's method of transportation on the day they were interviewed. In the 1994 study some effort was exerted to obtain a better understanding of each person's activity orientation as a function of the activities they had participated in as a visitor to the area. It was determined that 19 percent of the users only biked when they visited the National Recreation Area. On the other hand, there were 20 percent that only hiked in the area. The remaining 60 percent had done both at some time. Over 1/3 (36 percent) hiked and biked, but hiked more intensively. About 1/4 biked more than they hiked in the area, but had also done both. This simple analysis reminds us to think of visi-

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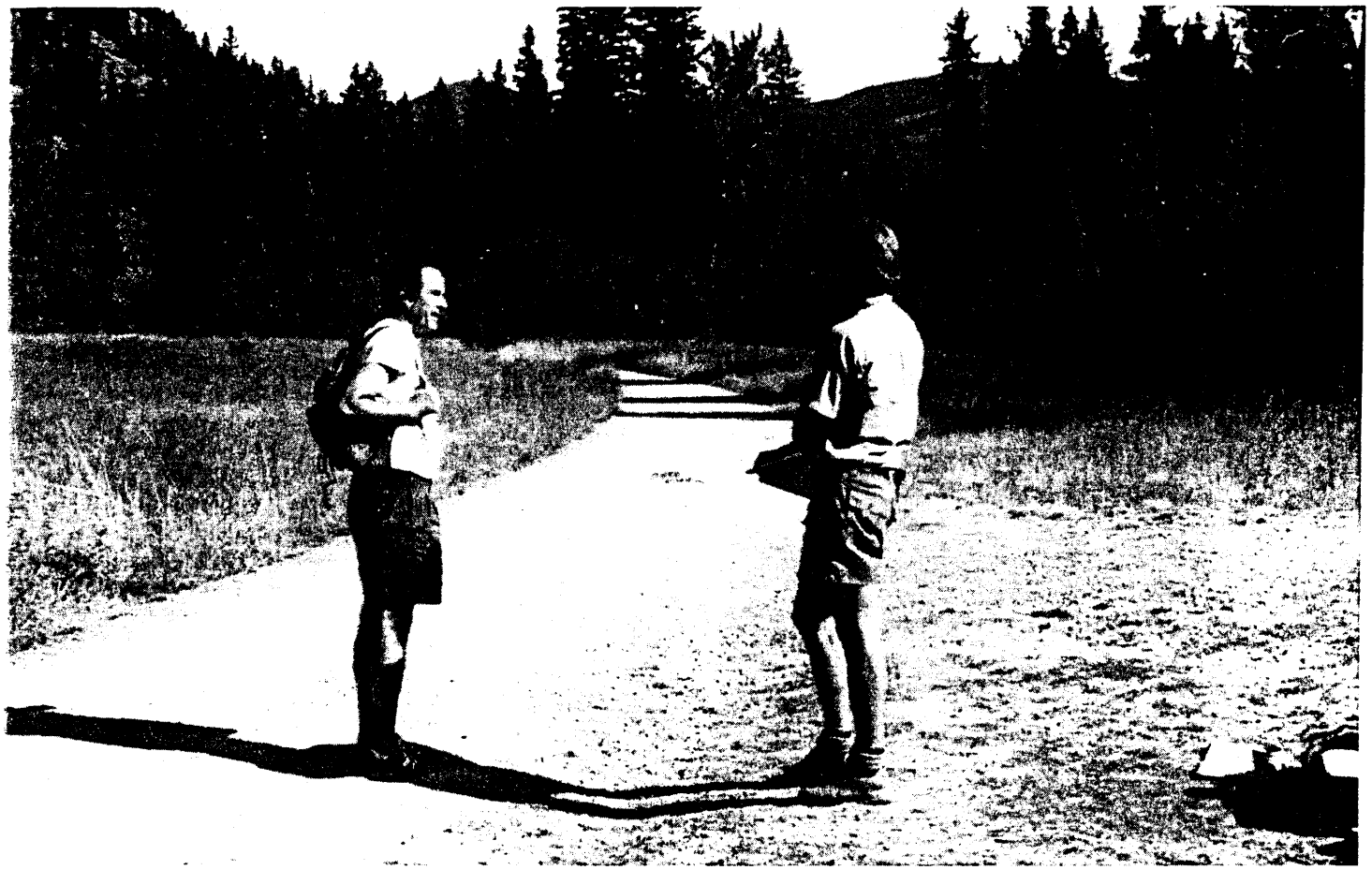

*The hiker you stop to chat with may be on a bicycle another day, and the bicyclist may have strong hiking interests, too.*

tors in terms of their overall activity orientation rather than their activity when encountered on a single day. A hiker you stop to chat with may be on a bicycle another day, and a bicyclist may also have strong hiking interests. As a matter of fact, only about every other hiker or biker we encountered in our study demonstrated a single, narrow activity orientation to the Rattlesnake.

The importance of this information is illustrated when the level of conflict is examined for each of the four groups described above. While we previously established that 21 percent of the 1994 sample of hikers expressed conflict with mountain bikers, that amount climbed to 28 percent for those hikers who never biked in the area. For those who most often hiked, but sometimes biked, the number was significantly lower at 14 percent. The strongest conflict was with an even more specific group than we had identified through the earlier study; the asymmetry was stronger for this one group (only hiked), though still existing for even the less strong hiker orientation portion of the visitor population.

**Causes of conflict.** Conflict can occur due to behavioral, knowledge level, skill level, attitudinal, or larger social value differences among the groups interacting at a recreation place. In the 1989 study at the Rattlesnake National Recreation Area two major behaviors of bicyclists were identified as sources of complaints by hikers. They were "traveling too fast" and "not being courteous." Bikers were often not aware that their behaviors were interpreted this way by hikers. An awareness campaign was initiated to get information out to bicyclists about appropriate trail etiquette when meeting hikers. A local mountain biking group was formed to improve self-education and the managers watched for opportunities, through brochures, signs, and interaction at public meetings and special presentations to interested groups to let bicyclists know these behaviors caused conflict, threatened their access rights, and were avoidable.

From the 1989 study it was also learned that bicyclists had much

Photo: Alan Watson

*Thirty percent of hikers who encountered bicycles at the Rattlesnake National Recreation Area disliked those encounters.*

more accurate perceptions of the similarities and dissimilarities between hikers and bikers than did the hikers. Some characteristics of the two groups for which bicyclists had much more accurate perceptions of how similar they were to hikers included types of places they live, lifestyles, types of jobs they had, education levels, income, attitudes toward the environment, and feelings about the value of that place. It was this kind of information that led the investigating group to suspect that there may be a substantial amount of crossover in activities between the two groups, leading bikers to hold more accurate perceptions of hikers because they were sometimes hikers, too.

**Options for management.** Many potential approaches to management of conflict have been developed and described by researchers. Many have been developed and applied by managers. In fact, Andy Kulla, a manager on the Lolo National Forest, developed a list of 17 potential methods of managing conflict between hiker and mountain bikers from a review of research literature and manager reports (Table 1). Andy did this as part of a paper for a course he was taking at Utah State University in 1990. The effects of many of these techniques have been tested in various situations by researchers and the likelihood of success of some of them for particular applications is well established in the literature. Accurate knowledge about the causes of the conflict should guide managers in selecting the appropriate solution from among alternatives. Behaviors and attitudes of both groups involved can be the target of management strategies, depending upon the details of the conflict.

**Reaction to the solution.** When Andy Kulla first listed the 17 potential management solutions, he listed them in an assumed order from least to most anticipated impact on the experiences of those who use the area. There was a need to better

understand if this hierarchy really existed and if so, how it could help managers select potential solutions. Previous literature has described the range of options available to management as varying in how directly they are applied. Direct management techniques imply those management applications that have direct effect on visitor behaviors and the presence of management is very obvious. Making regulations, enforcement of rules by patrols, or requiring specific behaviors of visitors have all been described as direct management methods. On the other hand, lighthanded methods are believed to have more subtle effects on behaviors, often through influencing attitudes, creating knowledge, or manipulating the environment to accomplish desirable ends. Most notable among lighthanded approaches are education programs, use of interpretive methods to create awareness of the effects of human behavior, and building trails in a way to influence the way visitors use an area. It has been implied in the past that more lighthanded methods of management are more desirable to visitors because they have less impact on visitor enjoyment. Management is less directly involved in the visitor experience, or at least the visitor believes that. The direct-indirect continuum is, however, a spectrum of management input, not impact to visitors. The degree these management techniques actually impact visitor experiences has not previously been measured.

In the Missoula, Montana, community there are many different types of users of the Rattlensnake National Recreation Area, though the most visible conflict is between hikers and mountain bike riders. A laboratory study was conducted on campus at the University of Montana which was aimed at understanding how various alternative conflict management techniques might affect all visitors' experiences. Members of bicycle groups, hiking groups, horse users, adjacent

**Table 1. List of alternative methods to manage recreational conflict. (Adapted from Kulla 1991)**

| Title | Explanation |
|---|---|
| Peer pressure | Encourage friends to be considerate of users and patrol their own ranks |
| Education | Work with establishments selling bikes, outdoor gear, saddles, etc., in an effort to educate users about low-impact use. Develop posters, brochures, logos, etc., to be recognized by users as reminders or symbols of considerate use. |
| Training programs | Develop training programs on low-impact recreation use for adults and children to be presented at clubs, organizations, etc. |
| Construct separate sections | Construct separate routes for recreation users where there is the greatest congestion (like at trailheads). |
| Indicate how users should travel through certain areas | Specify how users should travel through an area such as walking bikes, walking horses, or walking single file. |
| Signing | Urge recreation users to stay on routes and be considerate of others. |
| Enforce regulations on recreation use by the presence of uniformed officers | Have uniformed personnel patrol the recreation area and enforce the regulations. |
| One-way only | Designate the direction of travel on trails with very heavy use to avoid the potential for head-on collisions. |
| Barriers | Leave or install barriers to control speeds. Things like protruding rock, roots, bumps, sharp curves, down trees, speed barriers, and waterbars. |
| Post speed limits | Set maximum allowable speeds for all users. |
| Design new trails or reconstruct trails | Design features into trails that restrict speeds, enhance sight distance, and facilitate safe passing of recreation users. |
| Encourage separation of uses | Emphasize and encourage use of alternative sites for different users to reduce congestion and the potential for conflict. |
| Construct separate routes | Construct separate trails for recreation users when no other solution is feasible. |
| Zoning | Close portions of existing recreation areas to certain users and encourage that use in other designated locations within the area. |
| Patrolling | Use properly trained volunteer groups to patrol and talk with recreation users. |
| Restrict usage by day | Allow certain recreation uses only on specific days of the week. |
| Restrict usage by time | Allow certain recreation uses only at specific times of the day. |
| Eliminate certain activities | Close the recreation area to certain users. |

Photo: Alan Watson

*Bicyclists had much more accurate perceptions of the similarities and dissimilarities between hikers and bikers.*

home owners, snowmobile users, and students were invited to participate. The intent of the study was to measure the level of "obtrusiveness" of management actions, or the "magnitude of negative emotional response attributed to the actions of managers." In a way, we wanted to measure feelings of conflict, not toward other recreation users, but toward management who was working to reduce the level of conflict between different types of users.

From this research the team learned that there is not a simple hierarchy relating directly to previous assumptions about the direct-indirect continuum. There were patterns of response, with items grouping together based on similarities in obtrusiveness. The group of obvious restrictions, such as elimination of uses completely, or for certain days or at certain times, was the most obtrusive. These are also thought of generally as the most direct methods. At the other extreme, those things thought of as least direct, such as using education and other nonrestrictive options, grouped together in the least obtrusive level of management. In between, however, things were not as might be expected. Specific regulations, such as one-way only traffic signs, and patrolling and enforcement by uniformed employees or volunteers, was rated significantly

Photo: Alan Watson

*In a survey of visitors at the Rattlesnake National Recreation Area, it was discovered that 60 percent of all visitors both hiked and biked in the area at some time.*

Photo: Alan Watson

*One piece of information needed to manage conflict is to understand how much conflict exists among recreation users.*

less obtrusive than some less direct methods aimed at manipulating the environment, such as widening trails, creating barriers to control speeds, establishing speed limits, and a group of relatively direct techniques aimed at segregating activities. These segregating activities included simply encouraging separation of uses, designating single use trails, separating uses through congested areas, and zoning for specific uses.

## Conclusions

Knowledge about the conflict situation and the effects of applying alternative solutions can be vital information in deciding upon management approaches. Minimally, a manager should be able to describe the level of conflict, who is expressing that conflict, why they are expressing that conflict, and how these conflict factors have changed in the recent past. Secondly, management needs to anticipate the effects of management actions on legitimate users of the area. This information was obtained and used in decision making at the Rattlesnake National Recreation Area.

Besides the value of this information to local decision making, this scientific study contributed some information that will hopefully be considered in efforts to manage conflict in other recreation areas. Through in-depth study and consideration of the conflict situation it became apparent that even within the population of hikers there were some differences in attitudes toward the bikers and knowledge about biker characteristics and values. This was also apparent among the biker population. Closer study revealed that, in fact, the traditional approach to describing users based upon their method of travel on a single occasion was likely misleading. It was interesting to notice that on some occasions, during public meetings to discuss management of bicycles in the Rattlesnake, a concerned hiker may begin his or her statement of concern by announcing that he or she understands bikers' level of attachment to the area because of personal past experience biking there. For some others, this level of mutual understanding did not seem to exist. It can sometimes become a case of "us" and "them." Managers need the ability to address these two groups within the hiker population somewhat differently.

The second major finding from this cooperative work is likely to influence how we select conflict management approaches. Our objective in the past has almost exclusively been to reduce the conflict. More and more today we are acknowledging that we may not be able to remove the conflict. In fact, it may become apparent that the costs in terms of objections to management interference with certain recreation-desirable outcomes may be more negative than the conflict between user groups. The benefits of conflict reduction and the costs in terms of impacts to those visiting the area need to at least be analyzed through a subjective cost/benefits analysis. We must be careful not to accept lower conflict levels as the only indication of success of our programs. Visitors may be displaced due to the conflict that exists between types of recreation users or in response to management's efforts to control that conflict. ■

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