

A decorative graphic on the right side of the page consists of three overlapping circles of varying sizes, each with a dark blue center and a lighter blue outer ring. Two thin blue lines intersect at the top left and extend diagonally across the page, framing the circles.

# **Stakeholder Insights on ATV Use in Minnesota State- Administered Forest lands:**

## **Problem and Management Frames**

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# Executive Summary

## I. Introduction

All Terrain Vehicle (ATV) use in Minnesota (MN) state-administered forest lands is highly controversial and challenged by long-standing tensions that appear to defy resolution. This study is part of efforts by the MN DNR to better understand, plan, and manage ATV use and associated conflict in MN state-administered forest lands. The study sought to provide structure to the ATV controversy by offering stakeholders the opportunity to re-frame their perceptions of the problem with, and management of, ATV use in MN state-administered forest lands. By re-framing we mean providing an organized narrative. Specifically, this study uses a social science technique called Q methodology to (i) help stakeholders frame/re-frame their viewpoints and perceptions of the problem, (ii) provide insights into stakeholder-preferred management options, (iii) outline areas of consensus and conflict, and (iv) facilitate the development of a common view toward planning and managing ATV use in MN state-administered forest lands.

## II. Results

The results of this study, as in all Q studies, are not generalizable beyond those who participated in the study. However, we made considerable efforts to ensure more than required person sample. Most importantly we ensured that those who participated in the study were well versed, and had deep and prolonged involvement, with the issues. Thus, although the findings cannot be extrapolated to the general public, it represents well-informed perspectives on the problem and management frames.

### A. Stakeholder characteristics

The mean age of participants was 51 years; the minimum age was 20 years and the maximum was 78 years young. More than half of the participants were, at least, college graduates. There were 52 non-DNR and non-county participants whose data were usable for the problem frames; of these 52 participants, 32 owned and rode ATVs for various purposes. Similarly, for the management frame, approximately 57 % of non-DNR usable data were from participants who owned and rode ATVs in MN state-administered forest lands. In total, they were 96 and 97 usable sorts for the problem and management frames, respectively.

The application of Q methodology resulted in three significantly different but partially overlapping perspectives on what the problem is with ATV use in MN state forest lands. Likewise, analysis of the management frame data led to three distinct perspectives on how ATVs should or should not be managed in MN state-administered forest lands.

### B. Problem Frames

#### **Perspective 1: ATV Activity Problems: Poor Resource Protection and Management**

People who hold this perspective believe ATV activity causes significant environmental damage, the riders do not consider the true (full) cost of ATV riding on the environment and other values, and the MN DNR has been complicit in causing this damage through poor management of ATVs

including inadequate enforcement and ineffective penalties for ATV violations. They are skeptical that ATVs will be managed to protect the environment given political pressure from powerful interest groups (“big business,” “money talks”). They think that without explicit priority given to environmental protection, the problems with ATV use will persist. They believe there are not enough places for quiet (non-motorized) recreation; to them, we as humans have lost something if we cannot maintain the peaceful solitude of the forest. This perspective emphasizes the inability of ATV riders to meet their claims of ‘policing their members’ and matching their ‘feeling of entitlement’ with the ‘responsibility’ for ATV-caused damages.

**Perspective 2:           ATV Activity Problems: Stakeholder Mistrust**

Like the first perspective, people who hold this perspective believe ATV riders do not consider the true (full) ecological costs of ATV activity, including harmful effects on wildlife and humans. They believe ATV riders’ feeling of entitlement to ATV use is not balanced with responsibility to protect the environment; that the damage caused by ATVs is not overrated. However, this perspective is comfortable with the statutory definition of state forest lands and acknowledges a place for motorized recreation, including claims that ‘many environmentally friendly people’ are ATV riders. They believe the MN DNR has improved its commitment, and worked diligently and responsibly, to manage ATV use. To them, ‘mistrust’ between ‘factions’ in the ATV debate is a key part of the problem. While recognizing that all forms of recreational trail use are potentially harmful to the environment, they do not think there are enough opportunities for quiet recreation; to them, we as humans have lost something if we cannot maintain the peaceful solitude of the forest. In as much as they acknowledge the social and economic benefits of ATV recreation, they strongly disagree with claims that limited ATV access is unfair to forest users of certain age and physical condition.

**Perspective 3:           A Few Bad Apples: Unclear Rules/Signs**

This perspective includes the beliefs that ATV riding is a legitimate use of public lands, and that it is a source of family fun, economic benefits, and practical uses. The problem is with a small minority of irresponsible ATV riders and their “unlawful behaviors”. They think the MN DNR has generally done a good job managing ATV use, but there is significant room for improvement in clarifying permitted uses, clearer trail signs, etc. They think that unclear distinctions between minimum maintenance roads, ATV trails, and forest system roads partially explain ATV trail violations. They deny claims that ATV riders do not consider the true (full) ecological and social costs of ATV activity, including harmful effects on animals and humans; a viewpoint that markedly situates this perspective at odds with the other two.

**Problem Perspectives: Consensus and Conflict**

*Consensus*

All three problem perspectives agree with the statement that “*The lack of agreement on recommendations calling for protection of natural resources in the ATV management process stands in the way of a better ATV system in MN for the future.*” All three problem perspectives

also agree that there are too many uncoordinated factions making rules that are confusing to ATV riders, and that there exist, among ATV factions, unhealthy, deep suspicions of each others' motives. All three perspectives disagree with claims that 'we don't need trail signs everywhere' because biophysical conditions facilitate trail identification, and that the current permitted uses are clear.

### *Conflict*

The problem perspectives expose three distinct, highly contentious issues:

- 1) The behavior of ATV riders and the social and ecological costs of ATV activity. Stakeholders who hold perspective 1 and 2 strongly believe that 'ATV riders do not pay the true cost of their sport' and that ATV riders' feeling of entitlement to ATV use is not matched by a corresponding responsibility for ATV-caused damages; Stakeholders who hold perspective 3 strongly disagree with these claims.
- 2) The role that the DNR plays in the ATV management process and whether such role sufficiently protects the environment and is not tainted by political and economic influences. Stakeholders who hold perspective 1 believe MN DNR has done a poor job managing ATVs, while stakeholders who hold perspective 2 and 3 believe MN DNR has generally done a good job managing ATV use.
- 3) The adequacy of places for solitude-like experiences in MN. Stakeholders who hold perspective 1 and 2 strongly disagree with claims that 'there are enough places for solitude-like experiences in MN because state parks and other units provide better opportunities for solitude'. Perspective 3 somewhat agrees with this claim.

## **C. Management Frames**

Similarly, the question as to how we should or should not manage ATVs in MN state-administered forest lands was framed into three distinct management options. The problem and management frames are self-standing independent entities.

### **Perspective A: Professional, Scientific Management**

This is a pro-management perspective, centered on strong disagreement with the view that the ATV issue will fix itself with time. Those who hold this perspective believe ATV trail planning and management should be informed by ecological expertise and ought to include setting aside large ATV-free areas. They believe that effective management and minimization of ecological damage requires: avoiding political influences; sufficient enforcement; adequate funding; including ATV user fees for trail maintenance and enforcement. Holders of this perspective believe the idea of multiple uses is unreasonable, and the environment and other types of forest recreation could be negatively affected by increased ATV activity. To avoid spread of illegal trails, those who hold this perspective believe it is better to post signs on trails that are open rather than those that are closed.

### **Perspective B: Fair, Balanced Sustainable Management**

Like perspective A, this perspective is pro-management; they strongly disagree that the ATV issue will fix itself with time. They emphasize fairness, balanced multiple use, and sustainable management. According to this perspective, ATV riding is a legitimate use of public lands that can be balanced with other uses through good management and compromise. All types of ATV riding (e.g., multiple skill levels, including challenging riding areas) should be accommodated on public lands.

### **Perspective C: Enforcement and Balanced/Multiple Use**

According to this perspective, stringent management, sufficient enforcement, and funding are needed for proper management of ATV use on public lands. They believe balance and compromise between motorized and non-motorized uses and users of public lands should be pursued. Like Perspective B, management should provide a sustainable trail system and should emphasize fairness to all users of public lands. Holders of this perspective think connecting trails to local businesses to make obvious the economic contributions of ATV recreation. They would like ATV trails to be developed in urban areas; they advocate multiple use of trails for ATVs and snowmobiles, accommodation of multiple skill levels, and improving the accuracy of current ATV trail maps. They are for harmonization of the otherwise confusing rules where trails transcend federal, state, and county boundaries.

### **Management Perspectives: Consensus and Conflict**

#### *Consensus*

All three management frame perspectives agree that: (i) there should be ATV speed limits where people feel it is dangerous or unsafe; (ii) without adequate funding, the DNR will not be able to implement any of the badly needed improvements in trail maintenance, repair, and enforcement; (iii) user fees to help manage the ATV problem would be beneficial. It is worth noting that we did not inquire about participants' knowledge of existing ATV fees. However, 57% of the usable sorts came from ATV users and participants were selected based on their involvement and consequent knowledge of ATV issues. All perspectives disagree with the idea that signs directing people to call DNR enforcement in case of an ATV violation will be helpful.

In general, participants agree more about how to manage ATVs than they agree on what the problem is with ATV use in MN state forest lands. The conflict is not focused on whether we should have ATVs in MN state forest lands; it appears to be about the circumstances under which ATV activities should occur. It is apparent that the DNR staff respondents are more flexible in the perception of the problem and of management options than other stakeholders.

#### *Conflict*

The management frames expose two major contentious areas:

- 1) The claims that increased ATV activity will increase violations and negatively impact other forms of forest recreation. Stakeholders who hold perspective A strongly agree with this claim, while those who hold perspectives B and C strongly disagree with it.
- 2) The notion of ‘multiple use’, where ATVs should be allowed and under what conditions. Stakeholders who hold perspectives B and C very much support the notion of multiple uses while perspective A is somewhat against it. Perspectives A and C agree that ATV traffic should be allowed only in areas judged as suitable by professional foresters and ecologists’ while perspective B disagrees with it. Perspectives A and C strongly disagree with claims that ATV use of abandoned logging roads will help minimize ATV damage while perspective B somewhat agrees with this claim. Perspectives B and C will like ATV trails to include access to local businesses to facilitate riders’ contribution to local economies while perspective A is against it. Perspectives A and B both agree that it is better to post signs on trails that are open rather than those which are closed because when an ATV goes off-trail it creates an unmarked new trail; perspective C disagrees with these claims. Perspectives A and C agree that ‘ATV management should be stringent with no grey areas’ while perspective B disagrees with that request. Perspective B and C are in support of, an ambassador type program to assist with safety, education and monitoring and, the development of a system spreading ridership throughout the state as a means to protect resources and meet recreational demands. Perspective A is against these two claims.

### **Comparing Problem and Management Frames**

Several insights can be gained from comparing the problem and management frames. Overall, the most popular problem frame among participants is problem perspective 3 with 45.8 (44 of 96) percent of participants significantly agreeing with that perspective. Management perspective A was the most popular with 51.6 (50 of 97) percent of participants significantly associated with that perspective, almost as many participants as the other two management perspectives combined. Most notably, there is a strong association between problem frame 1 and management frame A; about 78 percent (31 of 40) of those who significantly agree with problem perspective 1 also significantly agree with management perspective A. Similarly, 51.3 percent (20 of 39) of those who significantly agree with problem perspective 2 also significantly agree with management perspective A, while 6.8 percent (3 of 44) of those who significantly agree with problem perspective 3 also significantly agree with management perspective A.

No individual significantly agree with both problem perspectives 1 and management perspective B. Almost 18 percent (7 of 39) of those who significantly agree with problem perspective 2 also significantly agree with management perspective B, while 45.5 (20 of 44) percent of those who significantly agree with problem perspective 3 also significantly agree with management perspective B.

Ten percent (4 of 40) of those who significantly agree with problem perspective 1 also significantly agree with management perspective C, while ~ 10 (4 of 39) percent of those who significantly agree with problem perspective 2 also significantly agree with management

perspective C. About 36.4 percent (16 of 44) of those who significantly agree with problem perspective 3 also significantly agree with management perspective C.

The relatively low levels of significant disagreements across problem and management frames were also insightful. The largest association of significant disagreements was among those who significantly disagree with problem perspective 1. Twenty percent (2 of 10) of those who significantly disagree with problem perspective 1 also significantly disagree with management perspective A, while 11.4 percent (5 of 44) of those who significantly agree with perspective 3 of the problem frame significantly disagree with management perspective A. Only one of 40 individuals who significantly agree with perspective 1 of the problem frame significantly disagrees with perspective B of the management frame, the only individual of all participants who significantly disagree with this management frame.

### **III. Discussion and Conclusions**

In general, there is a higher negative inter-perspective association among problem frame perspectives (Table 7) than among management frame perspectives (Table 14 i.e., there are stronger disagreements (between perspectives 1 and 2) about what the problem is with ATV use in state-administered lands than there is about any pair of perspectives about how we should manage ATVs in state-administered lands). Stakeholders found some level of consensus on only 9 of the 60 statements about what the problem is with ATV use in MN state forest lands. On the management front, however, stakeholders found some level of consensus on 19 of the 55 statements about how we should or should not manage ATV use in MN state forests. Additionally, only seven individuals significantly disagreed with one management frame perspective or the other, while 14 individuals significantly disagree with one problem frame or the other.

These results suggest that stakeholders disagree less about how to manage ATVs than they do about what the problem is with ATV use in MN state forest lands. This phenomenon is somewhat comparable to Maier's (1967) idea of "solution mindedness," i.e.,

*"... an anxiety to reach a solution to the problem as given..., which tends to inhibit the exploration of novel avenues of attack on the problem and the generation of new and inventive ideas about the problem."*

Solution mindedness is said to be one of the major reasons why environmental conflicts are so hard to resolve (Bardwell, 1991).

The fact that there were so many multiple positive loaders speaks to the notion that participant perspectives about ATV problems and management options are not "carved in stone." Additionally, most of these multiple loaders are from the DNR, evidence of the existence of considerable flexibility among DNR ATV-related staff in perceiving the ATV controversy and the important role that this flexibility might be playing in buffering the intensity of the conflict.

## Management Considerations

There were some indications of places to begin and/or foster dialogue regarding problem identification and consequent management. All three problem frame perspectives agree, without significant differences, on the problem frame statement that “*The lack of agreement on recommendations calling for protection of natural resources in the ATV management process stands in the way of a better ATV system in MN for the future*” (statement no. 18, Tables 8 and 9). Additionally, all three perspectives unanimously, but varyingly, agree with the following statements: (i) there are too many uncoordinated factions (feds, state, county) who make ATV rules and that is confusing to riders (statement no. 27, Table 9); (ii) ATVs are useful for hunting and the retrieval of game carcasses from hard-to-get-to areas (statement no. 19); (iii) One of the major issues with ATVs is that the motorized and non-motorized factions have unhealthy, deep suspicions and mistrusts of each others' motives (statement no. 42); and (iv) All forms of recreational trail use carry with them the potential for negative environmental effects (statement no. 50).

Similarly, all three problem perspectives disagree, though varyingly so, with the following statements: (i) we don't need trail signs everywhere because area boundaries are typically well-defined and easily recognizable to ATV users (statement no. 23); (ii) The current permitted uses in state/federal forest roads and trails are clear and easy to know what is allowed where (statement no. 26); (iii) I don't think the level of non-motorized use justifies the current acreage reserved for it (statement no. 8); (iv) There is no place for motorized recreation in Minnesota public forests (statement no. 40). In total, there is some level of consensus, among all three perspectives, on 9 of the 60 statements about the problem(s) with ATV use in MN state forest lands. See Table 9 for finer distinctions and similarities among perspectives.

There are three highly contentious issues with the problem frames. The first one is with regards to the behavior of ATV riders and the social and ecological costs of ATV activity. Perspectives 1 and 2 strongly believe that ‘ATV riders do not pay the true cost of their sport’ and that ATV riders’ feeling of entitlement to ATV use is not matched by a corresponding responsibility for ATV-caused damages; perspective 3 strongly disagrees with these claims. While perspectives 1 and 2 strongly disagree with claims that ATV-caused damages are ‘overrated’, perspective 3 somewhat agrees with that claim. A second area of contention is with regard to the role that the DNR plays in the ATV management process and whether such role sufficiently protects the environment and is not tainted by political and economic influences. Perspectives 2 and 3 see the DNR’s role as favorable while perspective 1 is highly critical of the DNR’s role in the planning and management of ATVs in state forest lands. The third contentious issue is the claim that ‘there are enough places for solitude-like experiences in MN’; perspectives 1 and 2 strongly disagree with this claim, while perspective 3 somewhat agrees with it.

After spending over fifty hours with various stakeholders, it was obvious that the ATV conflict is not just about facts, social values, and politics but also about myths. One of the strengths of Q methodology is that it enables stakeholders to check their understanding of an issue with those of

other stakeholders. During the course of the study, we were able to identify and verify some myths about the ATV conflict pertaining to those who participated in the study.

Myth #1: *Non-motorized forest recreationists and environmentalists do not accept a place for ATVs in MN state forest lands.*

**Reality:** All perspectives in the problem frame disagree with the statement that “There is no place for motorized recreation in MN public forests.” This is particularly important because it suggests that the question is not whether we should have ATVs in state forest lands but under what conditions.

Myth #2: *Environmentalists are the champions of an anti-ATV movement.*

**Reality:** Although all four individuals who identified themselves as environmental advocates loaded negatively on perspective 3 of the problem frame, none of those loadings were statistically significant. The same is true for the two environmental advocates who load negatively on perspectives B and C of the management frame. That is, although these individuals disagree with some perspectives, their disagreements are relatively insignificant. It is worth noting that 4 individuals is a relatively small number to make generalizations beyond those who participated in this study. However, these individuals were identified as some of the most environmental and anti-ATV activity on MN public forests lands. On the contrary, those at the extreme opposing ends of the conflict continuum appear (based on their significantly negative loading scores on the problem and management frame perspectives) to be members of ATV clubs, high recreational use ATV riders, and members of the DNR parks and trails, trails section, on one hand, and private land owners on the other. On one hand, members of ATV clubs, high recreational use ATV riders, and members of the DNR parks and trails, trails section, disagree significantly with perspectives 1 and perspective A of the problem and management frames, respectively. On the other hand, the private land owners who disagree significantly with perspective 3 of the problem frame do not significantly disagree with any management frame perspective. The major issues of contention between these two extremes are related to the sufficiency of places for solitude like experiences and the role that the DNR plays in managing ATVs, including claims and counter claims that such role is tainted with political and economic influences.

Perspective 3 of the problem frames, where 14 of the 20 defining sorts are either ATV club members or high recreational ATV users, strongly disagree with the statements that “I don’t think that the level of non-motorized use justifies the current acreage reserved for it.” (See statement no. 8, Table 6). This disagreement somewhat disputes the myth that: *ATV riders think that there is too much land available for non-motorized recreation.*

# Introduction

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All Terrain Vehicle (ATV) use in Minnesota (MN) state forest lands is highly controversial and challenged by long-standing tensions that appear to defy resolution. The conflict persists despite consensus-building and administrative efforts by the MN Department of Natural Resources (MNDNR) together with political and legislative initiatives. Stakeholders variously describe the conflict as complex, irresolvable, difficult to manage, and stubborn. The conflict is dynamic (Hunter, 1989); stakeholders often see the possibilities for resolution differently at different times. These attributes make the ATV conflict apparently intractable (Lewicki et al., 2003).

The MNDNR continues to make efforts to better understand, plan, and manage ATV use and associated conflict in Minnesota (MN) state forest lands. This study is part of such efforts; it provides structure to the ATV controversy by offering stakeholders the opportunity to re-frame their perceptions of the problem with, and management of, ATV use in MN state forest lands. The study provides a framework for stakeholders to better understand each other and to enhance planning and management efforts. This study uses a social science technique called Q Methodology to (i) re-frame stakeholder viewpoints and perceptions of the problem, (ii) provide insights into stakeholder-preferred management options, (iii) outline areas of consensus and conflict, and (iv) facilitate the development of a common view toward planning and managing ATV use in MN state forest lands.

## Q Methodology

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### *Background*

Q methodology, often simply referred to as Q, is an alternative to survey-based research in the social sciences (generally called R methodology). Although Q and R factor analyses are both used to reveal latent similarities in data, or check similarities, R factor analysis reduces data about individuals into traits while Q identifies common patterns of traits, resulting in a taxonomy of perspectives, perceptions, or frames (Clarke, 2002). A factor analysis is a way of identifying a fewer number of underlying variables that account for changes among a much larger number of variables; in our case, the variables are the stakeholders and the fewer number of underlying variables are called perspectives, viewpoints, or discourses. Thus, Q attempts to analyze subjectivity in a structured and statistically interpretable form (Brown, 1980; Stephenson, 1935); it is pre-occupied with the production of sets of perspectives explaining the attitudes existing in and among people regarding an issue (Addams & Proops, 2000; Barry & Proops, 2000). Q seeks to identify shared views among individuals, rather than variables; it measures people's affinity with those views including similarities and differences among individuals and across groups. Consequently, Q has additional capacity to reveal underlying and/or unrecognized perspectives

representing other agendas connected to an issue. Q methodology is especially suited for contentious issues (Eden et al., 2005), such as ATV use in MN state forest lands. Thus Q allows planners, managers, policy makers, and other stakeholders to understand, or check their understanding vis-à-vis, the perspectives or belief structures of other stakeholders (Stephenson, 1935). Q is viewed as more democratic and egalitarian than other means of analyzing public perspectives (Dryzek, 1990, 182). This is especially the case when statements used are derived directly from stakeholders and their “raw verbiage” is taken back to them for sorting (Brown, 2002). This approach allows stakeholders to speak for themselves, making Q an interactive, stakeholder-driven process (Dryzek & Berejikian, 1993).

## *Method*

In Q methodology, research subjects are asked to rank a set of statements or other stimuli into a grid of numbered columns across a agree-disagree continuum (see Appendix A, Figures A-1 and A-2 for the grids used in this study). The ranking process is called sorting and the resulting patterns are then analyzed to produce a set of shared views about the topic. In this study, this process was undertaken in several phases. First we generated a concourse, i.e., a set of statements pertinent to ATV use in MN state forest lands. We collected most of the statements from comments submitted by stakeholders to ATV planners and managers as part of the Off Highway Vehicle (OHV) public participatory planning process. Records of the public participatory planning process were obtained from MN DNR staff, Brian McCain, Jack Olson, and Bill Johnson. Statements from these records were supplemented with those from newspaper articles, and other literature, including the 2003 Motorized Trail Task Force Report. We stopped collecting statements when further statements did not add new information to those already collected. In total, we had about 1000 statements.

Second, the concourse was qualitatively analyzed and sampled. A preliminary analysis of the concourse revealed two major categories of issues; statements about what the problem is with ATVs and what ATVs are good for. We called that group of statements (about 600 of them) the problem frame concourse. The second group of about 400 statements consisted of statements about how we should or should not manage ATVs; the management frame concourse. For each concourse, a thematic analysis was conducted. Examples of themes for problem frames include: ecological protection and damage; the social, economic and ecological benefits of ATVs; access equity and justice; ATV regulation and enforcement; ATV trail signage, connectivity and maintenance; political and economic influences on ATV planning and management; the behaviors of ATV riders; the attitudes of anti-ATV groups. Examples of management frame themes included: no management; user fee increases; improved signage, connectivity and trail maintenance; improved dialogue and organizational structure of management; increased education, regulation and enforcement; avoiding economic and political influences on planning and management; separation of ATV activity from other forms of forest recreation; balanced and/or multiple use of state forest lands; sustainability.

We drew a sample of statements such that each theme and sub-theme was represented and replicated at least once. Five volunteers participated in a test run of the sorting exercise. Based on the feedback of these volunteers, statements were added and some removed to ensure that the concourse was more comprehensive. We also re-worded some statements, to ensure balance of negative and positively phrased statements. In re-wording these statements, efforts were made to retain the essence of stakeholders' 'raw verbiage.' We ended up with 60 and 55 statements from the problem and management frame concourses, respectively. These statements were each printed on a colored business-sized card; a deck of 60 blue cards for the first set of 60 problem frame statements, and a deck of 55 orange cards for the set of 55 management frame statements.

Third, we identified and invited stakeholders to participate in the study. In Q methodology, the participants (or stakeholders) are the variables, i.e., the various opinions and perspectives that inform the issue being studied. To ensure that research subjects' privacy and other concerns were protected, we submitted the study to the University of Minnesota's Institutional Review Board for review and approval. We selected people who: (i) are recently or currently active in the ATV planning and management process, (ii) are active users of MN state forest lands, (iii) represent interest groups pertinent to ATV use in state forest lands, (iv) own private property in neighboring ATV-active public forest lands, and (v) studied various aspects of ATV use in MN. A list of potential participants was obtained from the Division of Trails and Parks, Trails section and supplemented by other sources, including a list of private land owners around state forests with ATV activity. Brian McCain, Jack Olson, and Bob Moore helped recruit some stakeholders. We contacted participants via email or telephone, introduced them to the study, explained why they were selected, and told them about Q methodology and the Q sort exercise. Over 200 stakeholders were invited to participate in the study. Typically, Q methodology uses fewer numbers of participants (research subjects) but we wanted to enable coarse comparisons within categories of stakeholders. As the study progressed, invitations were either withdrawn or augmented based on numbers of already completed sorts from any given category of stakeholders. Non-DNR stakeholders, excluding two county recreation staff members who were directly invited by us, received a \$50 honorarium for participating in the study.

Fourth, stakeholders conducted the sorting exercise between March and June, 2009. Participants were provided with and asked to read and sign a consent form before beginning the sorting process (see Appendix A). A total of 117 individuals (25 females and 90 males) from 17 major categories of stakeholders participated in the study. Some sorts were unusable because participants did not fill in the grids correctly, statements were placed in more than one box or were omitted completely. The final data input resulted in 96 and 97 useable sorts for the problem and management frames, respectively (Table 1). Other sub-categories embedded within the 17 major ones included people with physical disabilities who use ATVs to access state forest lands, private business owners who serve the ATV community, and 5 members of the 2003 Motorized Trail Task Force.

*Table 1: Major Categories of Stakeholders and Numbers of Useable Sorts from Each Category.*

|     | Participant Category   | Number of Useable Sorts |                    |
|-----|--|-------------------------|--------------------|
|     |  | Problem Frames          | Management Options |
| 1.  | DNR Office of Management & Budget Services, and Management Resources (OMBS)  | 5                       | 4                  |
| 2.  | DNR Fish & Wildlife (FAW)  | 7                       | 10                 |
| 3.  | DNR Enforcement (ENF)  | 7                       | 7                  |
| 4.  | DNR Forestry (FOR)   | 8                       | 10                 |
| 5.  | DNR Parks & Trails (Trails) (PATT)   | 7                       | 4                  |
| 6.  | DNR Parks & Trails (Parks) (PATP)  | 3                       | 3                  |
| 7.  | DNR Ecological Resources (ECR)   | 4                       | 4                  |
| 8.  | County Recreation Planner/Manager  | 3                       | 4                  |
| 9.  | ATV Club Members   | 11                      | 8                  |
| 10. | Non-motorized forest recreationists  | 7                       | 8                  |
| 11. | Private land owners  | 6                       | 6                  |
| 12. | Practical Riders, Low Recreational Use   | 9                       | 10                 |
| 13. | Practical Riders, High Recreational Use  | 4                       | 4                  |
| 14. | Balanced Riders, High Recreational Use   | 5                       | 5                  |
| 15. | Balanced Riders, Low Recreational Use  | 3                       | 2                  |
| 16. | Environmental Advocates  | 4                       | 4                  |
| 17. | Researchers in Academia and Federal Agencies who have recently studied some aspect of ATV use in MN state forest lands | 3                       | 4                  |
|     | Total  | 96                      | 97                 |

Sorting was scheduled at several locations at the convenience of participants. The US Forest Service hosted a series of group sorting sessions during weekends, and scheduled sorting meetings with individuals during weekdays. Scheduled sorting meetings with individuals and small groups were also held at the DNR Central Office cafeteria and other meeting rooms. We traveled to participants' residents for some sorts while others were hand delivered to respondents, some of whom completed the sorts and mailed them to us. Mary Straka helped recruit and administer some sorts to participants who could not attend the scheduled meetings outside the Twin Cities. Sorting sessions outside the Twin Cities area were held at the Cloquet Forestry Center, the Brainerd Public Library, and DNR Regional Offices in Brainerd, Grand Rapids, Bemidji and Hibbing.

Participants were each handed three decks of cards; a deck of 60 blue cards for the problem frames; a deck of 55 orange cards for the management options; and a third deck of 38 cards for a second set of problem frame statements. Participants were asked, first, to pick a deck of cards and read through each card and sort them into three piles: a pile each for statements they agreed with, disagreed with, and were either neutral or inconsequential to their thinking about all the statements in that deck. Then, they were asked to sort the cards into the grids, shown in Figure 1,

according to their agreement or disagreement with the statements on each card. This procedure allowed participants to weigh the merits of each statement and to select the most preferable ones; a process referred to as ‘re-framing’ in environmental conflicts (Lewicki et al., 2003). Participants were asked to move cards around as they saw fit and their sorts were not collected until they affirmed their satisfaction with the sorting. Participants were also asked to comment on the study and to provide socio-demographic information; see Appendix A for the set of instructions, Q sorts, response sheets, and score grids. The same procedure was repeated for the second and third decks of cards. It took an average of two hours to complete all three sorts. Some participants thought the exercise was time consuming but interesting and stimulated their thinking. Participants reported that the exercise was an introspective one, enabling them to reflect on the fact that there are multiple ways to view the ATV issue. Most importantly, our goal of enabling stakeholders to re-frame the problem (perceive the exercise as a negotiation with other stakeholders in absentia) was confirmed by many participants. In total, we spent over 50 hours with various stakeholders during the course of the study.

Data were entered and analyzed using PQMethod version 2.11 software. For the problem frame sorts, a correlation matrix of all 96 sorts was generated. The matrix was subjected to principal component factor analysis resulting in eight un-rotated factors (perspectives), all of which had Eigen values  $\geq 1.0$ . These perspectives were rotated using VARIMAX orthogonal method, following Stephenson (1953, 1964) and Brown (1980). The same procedure was repeated for the management options. Three perspectives were retained based on their respective explanatory values of  $\geq 7\%$ , following Weber & Tuler (2001). Each perspective is the same as a unique Q sort making it possible to compute individuals’ loading scores for each perspective. A loading score is a measure of the strength of association of each participant’s Q-sort to that perspective (see Tables 4 and 11). The loading score ranges from +1.00 (when the individual’s sort exactly matches the perspective) to -1.00 (when the individual’s sort is the exact opposite of that perspective). The significance of a loading score is determined by the Equation: Loading Score =  $2.5 * \text{Standard Error}$  (Brown, 1980). Loading scores with an X indicates defining sorts, i.e., individuals whose sorts define that perspective. For the problem frame, loading scores  $\geq 0.32$  are significant, while for the management frames, loading scores  $\geq 0.34$  are significant. The higher the positive loading score, the more the individual agrees with that perspective and the higher the negative score, the more that individual disagrees with that perspective.

The analysis of data using Q methodology results in a variety of outputs. Relevant to this study, we report the following:

- A table of normalized (Z-scores) scores, one for each perspective. A Z-score is the number of standard deviations from the mean; Z-scores are computed to enable finer distinctions between statements with the same Q sort rank, i.e., all three statements with a Q sort rank of 5 will have slightly different Z-scores. The table of normalized Z scores defines the various perspectives.

- A table of loading scores for all perspectives; this table shows the degree to which each individual agrees or disagrees with each perspective.
- A table of inter-perspective correlations which enables us to tell the degree to which perspectives are similar. The correlations range from +1.00 (indicating perfect agreement) to -1.00 (indicating complete disagreement).
- A table of all statements ranked in descending order of consensus vs. agreement, and a table of consensus statements. These tables make possible the comparisons of various perspectives.

## Results

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The results of this study, as in all Q studies, are not generalizable beyond those who participated in the study. However, we made considerable efforts to ensure that we had more than required person sample. Most importantly we ensured that those who participated in the study were well versed, and had deep and prolonged involvement, with the issues. Thus, although the findings can not be extrapolated to the general public, it represents well-informed perspectives on the problem and management frames.

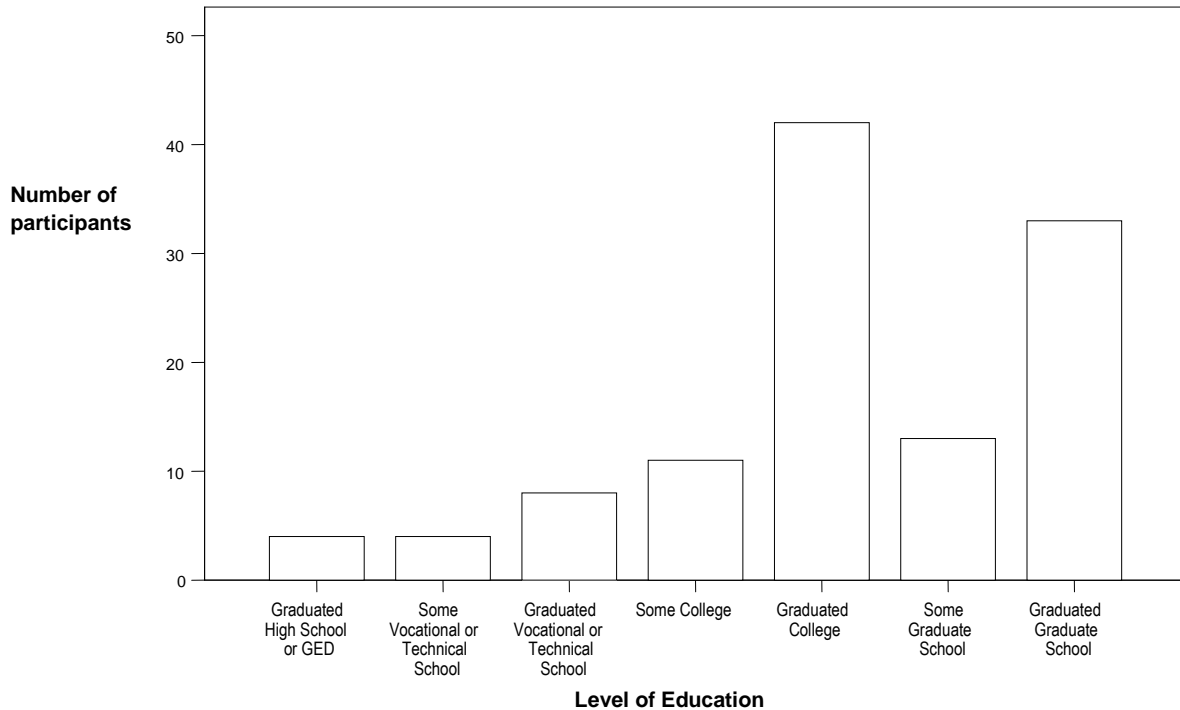
### Stakeholders Characteristics

Table 2 and Figure 1 show the summary of participant characteristics. The mean age of participants was 51 years; the minimum age was 20 years and the maximum was 78 years young. More than half of the participants are, at least, college graduates. The median age was 53 years. Participant demographics are somewhat skewed towards the older and more educated. There were 52 non-DNR and non-county participants whose sorts were usable for the problem frames; of these 52 participants, 32 of them owned and rode ATVs for various purposes. Similarly, for the management frame, about 57 % of usable sorts were from participants who owned and rode ATVs in MN state forest lands. There were 41 DNR participants whose sorts were usable for the problem frames; of these 41 participants, 33 of them owned and rode ATVs for various purposes. DNR participation including representatives from the following programs: DNR Forestry (FOR); DNR Fish & Wildlife (FAW); DNR Office of Management & Budget Services, and Management Resources (OMBS); DNR Parks & Trails, Trails section (PATT); DNR Parks & Trails, Parks section (PATP); DNR Enforcement , all of them field conservation officers (ENF); DNR Ecological Resources (ECR)

Table 2: Characteristics of Study participants.

| Characteristic       | Frequency | Percent |
|----------------------|-----------|---------|
| Non DNR participants | 67        | 57.3    |
| DNR participants     | 50        | 42.7    |
| Females              | 25        | 21.4    |
| Males                | 92        | 78.6    |

Figure 1: Distribution of Participants' Level of Education



The application of Q methodology resulted in three significantly different but partially overlapping perspectives on what the problem is with ATV use in MN state forest lands. Similarly, analysis of the management frame sorts led to three distinct perspectives on how we should or should not manage ATVs in MN state forest lands. In the sections that follow, and for each of the problem and management frames, we present: (i) brief interpretations of the three major perspectives; (ii) stakeholders associated with the three major perspectives; (iii) comparisons of perspectives, outlining areas of consensus and disagreement. Then, we report general findings of both problem and management frames.

## Problem Frames: Three Perspectives

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### *Perspective 1: ATV Activity Problems: Poor Resource Protection and Management*

People who hold this perspective believe ATV activity causes significant environmental damage; the riders do not consider the true (full) cost of ATV riding on the environment and other values; the MN DNR has been complicit in causing this damage through poor management of ATVs including inadequate enforcement and ineffective penalties for ATV violations. They are skeptical that ATVs will be managed to protect the environment given political pressure from powerful interest groups (“big business,” “money talks”). They think that without explicit priority given to environmental protection, the problems with ATV use will persist. They believe there are not enough places for quiet (non-motorized) recreation and this is a sign to them that we as humans have lost something important. This perspective emphasizes the inability of ATV riders to meet their claims of ‘policing their members’ and matching their ‘feeling of entitlement’ with the ‘responsibility’ for ATV-caused damages. See Table 3 for the statements that define this perspective. Note that both the large positive and large negative Z-scores in Table 3 define the “Poor Resource Protection and Management” view.

*Table 3: Normalized Scores for Perspective 1*

| No. | Statement   | Z-Scores |
|-----|---|----------|
| 34. | ATV riders do not pay the true cost of their sport: erosion, water quality, wildlife etc.   | 1.673    |
| 22. | The MN DNR create problems and increase ATV damage to our forest trails by designating far more miles of trails than they have resources to enforce.  | 1.642    |
| 31. | ATV groups claim that they can police their members, but the unrestrained damage caused by riders shows that ATV groups are ineffective in policing their members.                                  | 1.563    |
| 13. | The DNR has given into the "big business" and "money talks" pressures that come from the manufacturers of these machines and those who can afford to ride them.                                     | 1.523    |
| 45. | As humans, we have lost something if we cannot maintain the peaceful solitude of the forest.  | 1.520    |
| 7.  | Part of the problem with ATVs is the feeling of entitlement on the part of ATV users without a corresponding acceptance of responsibility for damage caused to the environment.                     | 1.519    |
| 12. | The answers to ATV problems seem obvious but no one is bold enough to make the decisions without being politically swayed.  | 1.397    |
| 60. | The DNR and environmental groups have done endless research, but in the end, ATV decisions are just up to someone with political gains to make.   | 1.393    |
| 10. | The pleas of ATV riders, bolstered by industry backed lobby, is enough to sway career natural resource experts to compromise forest ecological integrity and the legitimate rights of silent users. | 1.319    |
| 44. | The penalties for ATV violations are not severe enough to prevent ATV riders'   | 1.266    |

|     |  |        |
|-----|--|--------|
|     | misbehaviors.  |        |
| 21. | There is inadequate enforcement of ATV abuses, so violators have little incentive to obey laws.  | 1.242  |
| 43. | Without a clear statement that says the DNR must put the environment first, the ATV program will continue to face criticism, opposition and obstruction from environmentalists.          | 1.235  |
| 57. | No respect by ATV riders is a big problem, especially the teenage to upper 30-year-old thrill seekers.   | 1.041  |
| 46. | Having motorized and silent users share the same recreational areas in state forests show either ignorance or disregard for the user conflict and the obvious solutions to the conflict. | 0.972  |
| 23. | We don't need trail signs everywhere because area boundaries are typically well-defined and easily recognizable to ATV users.  | -1.056 |
| 5.  | Road and trail closure from ATV use discourages outdoor enthusiasts of a certain age and physical condition from enjoying nature.  | -1.087 |
| 56. | The MN DNR has improved its commitment to ensure that better control of ATV use in state lands is indeed fulfilled.  | -1.336 |
| 9.  | I am painfully aware that ATV recreation does not have the numbers or the dollars that the enviro-extremists groups throw at this issue to sway the outcome.                             | -1.343 |
| 29. | The DNR is looking to our future and is committed to protecting the integrity of Minnesota public forests.   | -1.373 |
| 28. | I am impressed with the preparation and diligence of DNR personnel to ensure that ATV riders and other public land users co-exist.   | -1.410 |
| 41. | The fanatics are trying to keep ATVs away just so they can say that they saved the forest from uses other than what they view as right for the forest.                                   | -1.447 |
| 48. | Too much shutting down of ATV access in proposed areas is unfair because we have places like the Boundary Waters Canoe Area for remote wilderness experiences.                           | -1.547 |
| 58. | The DNR uses sound natural resource and recreation management principles in addressing recreational challenges.  | -1.579 |
| 15. | Ideally, there should be zero miles of rutted trails but the ruts are not as bad as ATV opponents would like people to believe; the damage caused by ATVs is highly overrated.           | -1.598 |
| 11. | There are enough places for "solitude-like" experiences in MN because State parks, and other units (Wildlife Management and Natural Areas), provide better opportunities for solitude.   | -1.746 |

*Stakeholders Associated with Perspective 1: “Poor Resource Management and Protection”*

Those stakeholders whose sorts closely define the “poor resource management and protection” perspective include, all four environmental advocates, two conservation officers (COs), four low recreational use ATV riders, three non-motorized forest recreationists, one member PATP, three members each from the DNR Fish & Wildlife (FAW); and DNR Forestry (FOR), three private land owners, and two members of the DNR Office of Management & Budget Services, and Management Resources (OMBS). In general, 40 participants significantly agree with this perspective. Those who significantly disagree with this perspective include five of the seven

members of DNR Parks & Trails, Trails section (PATT), two ATV club members, and three high recreational use ATV riders.

See Table 4 for loadings of defining sorts (marked X) and individuals who significantly agree or disagree with this perspective (in bold; a positive loading signifies agreement while a negative loading signifies disagreement).

*Table 4: Table of Loading Scores; X Indicates Defining Sorts; Bold Indicates Significant Loadings*

|     | Q Sorts/Participants<br>Perspectives | Loadings     |              |              |
|-----|--------------------------------------|--------------|--------------|--------------|
|     |                                      | 1            | 2            | 3            |
| 1.  | DNR OMBS 01                          | <b>0.34</b>  | <b>0.80X</b> | 0.15         |
| 2.  | DNR OMBS 02                          | <b>0.70X</b> | <b>0.38</b>  | 0.03         |
| 3.  | DNR OMBS 03                          | <b>0.34</b>  | <b>0.33</b>  | 0.27         |
| 4.  | DNR OMBS 04                          | 0.26         | <b>0.72X</b> | 0.04         |
| 5.  | DNR OMBS 05                          | <b>0.69X</b> | 0.28         | -0.04        |
| 6.  | DNR FAW 01                           | <b>0.48</b>  | <b>0.58X</b> | -0.12        |
| 7.  | DNR FAW 02                           | <b>0.80X</b> | 0.04         | -0.07        |
| 8.  | DNR FAW 03                           | 0.20         | 0.15         | -0.10        |
| 9.  | DNR FAW 05                           | -0.03        | <b>0.75X</b> | 0.19         |
| 10. | DNR FAW 06                           | <b>0.66X</b> | 0.17         | -0.26        |
| 11. | DNR FAW 08                           | <b>0.57</b>  | <b>0.59</b>  | 0.13         |
| 12. | DNR FAW 10                           | <b>0.58X</b> | <b>0.44</b>  | -0.12        |
| 13. | “ ENF01                              | <b>0.53</b>  | <b>0.51</b>  | -0.13        |
| 14. | “ ENF02                              | -0.04        | <b>0.55</b>  | <b>0.36</b>  |
| 15. | “ ENF03                              | <b>0.53X</b> | 0.18         | 0.13         |
| 16. | “ ENF04                              | 0.15         | <b>0.78X</b> | 0.05         |
| 17. | “ ENF05                              | 0.10         | <b>0.40</b>  | 0.15         |
| 18. | “ ENF07                              | <b>0.86X</b> | -0.06        | -0.16        |
| 19. | “ ENF08                              | -0.01        | <b>0.34</b>  | <b>0.46</b>  |
| 20. | “ FOR01                              | 0.04         | 0.02         | <b>0.64X</b> |
| 21. | “ FOR02                              | -0.01        | <b>0.48X</b> | <b>0.38</b>  |
| 22. | “ FOR03                              | -0.30        | 0.12         | <b>0.69X</b> |
| 23. | “ FOR04                              | 0.03         | <b>0.46</b>  | <b>0.34</b>  |
| 24. | “ FOR05                              | <b>0.57X</b> | 0.07         | -0.08        |
| 25. | “ FOR07                              | <b>0.67X</b> | <b>0.41</b>  | -0.31        |
| 26. | “ FOR08                              | <b>0.53X</b> | 0.25         | -0.08        |
| 27. | “ FOR11                              | -0.15        | 0.07         | <b>0.54</b>  |
| 28. | “ PATT01                             | <b>-0.35</b> | 0.30         | <b>0.65X</b> |
| 29. | “ PATP03                             | <b>0.81X</b> | 0.10         | -0.26        |
| 30. | “ PATP04                             | -0.02        | <b>0.70X</b> | 0.05         |
| 31. | “ PATP05                             | -0.02        | 0.30         | 0.18         |
| 32. | “ PATT06                             | <b>-0.40</b> | 0.29         | <b>0.51</b>  |
| 33. | “ PATT07                             | -0.10        | <b>0.58</b>  | <b>0.55</b>  |
| 34. | “ PATT08                             | <b>-0.43</b> | 0.16         | <b>0.63X</b> |
| 35. | “ PATT09                             | <b>-0.42</b> | <b>0.34</b>  | <b>0.60</b>  |
| 36. | “ PATT10                             | <b>-0.46</b> | <b>0.44</b>  | <b>0.66</b>  |

|     |   |              |              |              |
|-----|---|--------------|--------------|--------------|
| 37. | “ PATT12                                  | -0.12        | <b>0.38</b>  | <b>0.65X</b> |
| 38. | “ ECR01                                   | <b>0.45</b>  | <b>0.59X</b> | 0.13         |
| 39. | “ ECR02                                   | <b>0.58</b>  | <b>0.46</b>  | -0.31        |
| 40. | “ ECR03                                   | <b>0.50</b>  | <b>0.62X</b> | -0.13        |
| 41. | “ ECR04                                   | 0.23         | <b>0.64X</b> | -0.01        |
| 42. | County Recreation Manager/Planner 01      | -0.14        | <b>0.40</b>  | <b>0.56</b>  |
| 43. | County Recreation Manager/Planner 02      | <b>0.40</b>  | <b>0.34</b>  | <b>0.42</b>  |
| 44. | County Recreation Manager/Planner 03      | -0.13        | 0.18         | <b>0.44</b>  |
| 45. | ATV Club Member 01                        | -0.26        | 0.06         | <b>0.66X</b> |
| 46. | ATV Club Member 02                        | -0.17        | 0.23         | <b>0.67X</b> |
| 47. | ATV Club Member 03                        | -0.08        | 0.15         | <b>0.46</b>  |
| 48. | ATV Club Member 04                        | -0.03        | 0.02         | <b>0.63X</b> |
| 49. | ATV Club Member 05                        | <b>-0.38</b> | 0.10         | <b>0.61X</b> |
| 50. | ATV Club Member 06                        | -0.07        | -0.004       | <b>0.65X</b> |
| 51. | ATV Club Member 07                        | <b>-0.33</b> | 0.18         | <b>0.71X</b> |
| 52. | ATV Club Member 08                        | -0.17        | -0.21        | <b>0.63X</b> |
| 53. | ATV Club Member 09                        | -0.30        | 0.09         | <b>0.72X</b> |
| 54. | ATV Club Member 10                        | 0.07         | -0.0001      | <b>0.52</b>  |
| 55. | ATV Club Member 12                        | -0.27        | 0.22         | <b>0.60</b>  |
| 56. | Non-motorized forest recreationist 03     | <b>0.75X</b> | 0.17         | 0.01         |
| 57. | Non-motorized forest recreationist 04     | 0.07         | <b>0.40X</b> | -0.05        |
| 58. | Non-motorized forest recreationist 05     | -0.01        | <b>0.56X</b> | <b>0.39</b>  |
| 59. | Non-motorized forest recreationist 06     | -0.13        | 0.22         | <b>0.33</b>  |
| 60. | Non-motorized forest recreationist 07     | <b>0.64X</b> | 0.22         | -0.28        |
| 61. | Non-motorized forest recreationist 09     | <b>0.81X</b> | 0.003        | -0.31        |
| 62. | Non-motorized forest recreationist 11     | 0.24         | <b>0.65X</b> | 0.27         |
| 63. | Private land owner 2                      | <b>0.78X</b> | 0.06         | -0.25        |
| 64. | Private land owner 3                      | 0.26         | <b>0.71X</b> | 0.30         |
| 65. | Private land owner 4                      | <b>0.39</b>  | <b>0.40</b>  | -0.02        |
| 66. | Private land owner 5                      | <b>0.54</b>  | 0.22         | -0.15        |
| 67. | Private land owner 6                      | <b>0.79X</b> | -0.03        | -0.32        |
| 68. | Private land owner 7                      | <b>0.74X</b> | 0.14         | <b>-0.34</b> |
| 69. | Practical Rider, Low Recreational Use 01  | -0.19        | 0.17         | <b>0.75X</b> |
| 70. | Practical Rider, Low Recreational Use 02  | <b>0.56</b>  | <b>0.45</b>  | 0.24         |
| 71. | Practical Rider, Low Recreational Use 03  | 0.23         | 0.31         | <b>0.60X</b> |
| 72. | Practical Rider, Low Recreational Use 05  | -0.05        | 0.10         | <b>0.45</b>  |
| 73. | Practical Rider, Low Recreational Use 06  | -0.11        | -0.06        | <b>0.82X</b> |
| 74. | Practical Rider, Low Recreational Use 07  | <b>0.50</b>  | <b>0.61X</b> | 0.09         |
| 75. | Practical Rider, Low Recreational Use 08  | <b>0.74X</b> | 0.03         | -0.22        |
| 76. | Practical Rider, Low Recreational Use 09  | <b>0.83X</b> | -0.11        | -0.21        |
| 77. | Practical Rider, Low Recreational Use 10  | <b>0.59X</b> | 0.26         | 0.11         |
| 78. | Practical Rider, High Recreational Use 01 | <b>-0.38</b> | 0.27         | <b>0.52</b>  |
| 79. | Practical Rider, High Recreational Use 02 | -0.28        | 0.21         | <b>0.35</b>  |
| 80. | Practical Rider, High Recreational Use 03 | <b>0.59</b>  | 0.24         | <b>-0.49</b> |
| 81. | Practical Rider, High Recreational Use 04 | 0.06         | 0.15         | <b>0.69X</b> |
| 82. | Balanced Rider, High Recreational Use 01  | <b>-0.33</b> | 0.24         | <b>0.60X</b> |
| 83. | Balanced Rider, High Recreational Use 02  | -0.02        | 0.28         | 0.29         |
| 84. | Balanced Rider, High Recreational Use 03  | <b>-0.33</b> | 0.01         | <b>0.64X</b> |
| 85. | Balanced Rider, High Recreational Use 04  | -0.02        | -0.07        | <b>0.36</b>  |

|     |  |              |              |              |
|-----|--|--------------|--------------|--------------|
| 86. | Balanced Rider, High Recreational Use 05 | -0.23        | 0.10         | <b>0.80X</b> |
| 87. | Balanced Rider, Low Recreational Use 01  | 0.10         | <b>0.54X</b> | 0.22         |
| 88. | Balanced Rider, Low Recreational Use 02  | -0.02        | <b>0.68X</b> | 0.20         |
| 89. | Balanced Rider, Low Recreational Use 03  | <b>0.76X</b> | -0.05        | -0.27        |
| 90. | Environmental Advocate 01                | <b>0.80X</b> | 0.09         | -0.26        |
| 91. | Environmental Advocate 02                | <b>0.79X</b> | 0.18         | -0.31        |
| 92. | Environmental Advocate 04                | <b>0.85X</b> | 0.16         | -0.08        |
| 93. | Environmental Advocate 05                | <b>0.86X</b> | 0.04         | -0.23        |
| 94. | ATV Researcher 02                        | <b>0.54</b>  | <b>0.48</b>  | <b>0.39</b>  |
| 95. | ATV Researcher 03                        | 0.12         | <b>0.66X</b> | <b>0.41</b>  |
| 96. | ATV Researcher 04                        | 0.10         | <b>0.47</b>  | <b>0.41</b>  |
|     | % Explanatory power                      | 20           | 14           | 17           |

### *Perspective 2: ATV Activity Problems: Stakeholder Mistrust*

Like the first perspective, people who hold this perspective believe ATV riders do not consider the true (full) ecological costs of ATV activity, including harmful effects on wildlife and humans. They believe ATV riders' feeling of entitlement to ATV use is not balanced with responsibility to protect the environment; that the damage caused by ATVs is not overrated. However, those who hold this perspective are comfortable with the statutory definition of state forest lands and acknowledge a place there for motorized recreation, including claims that 'many environmentally friendly people' are ATV riders. They believe the MN DNR has improved its commitment, and worked diligently and responsibly, to manage ATV use. In addition, they think the DNR has got a long way to go to adequately manage MN's ATV system. To them, 'mistrust' between 'factions' in the ATV debate is a key part of the problem. While recognizing that all forms of recreational trail use are potentially harmful to the environment, they do not think that there are enough opportunities for quiet recreation which, to them, signifies that we as humans have lost something of importance. In as much as they acknowledge the social and economic benefits of ATV recreation, they strongly disagree with claims that limited ATV access is unfair to forest users of certain age and physical condition. See Table 5 for statements defining this perspective.

*Table 5: Normalized Scores for Perspective 2*

| No. | Statement   | Z Scores |
|-----|---|----------|
| 34. | ATV riders do not pay the true cost of their sport: erosion, water quality, wildlife etc.   | 1.663    |
| 7.  | Part of the problem with ATVs is the feeling of entitlement on the part of ATV users without a corresponding acceptance of responsibility for damage caused to the environment. | 1.554    |
| 50. | All forms of recreational trail use carry with them the potential for negative environmental effects.   | 1.531    |
| 29. | The DNR is looking to our future and is committed to protecting the integrity of Minnesota public forests.  | 1.496    |
| 45. | As humans, we have lost something if we cannot maintain the peaceful solitude of the forest.  | 1.451    |

|     |   |        |
|-----|---|--------|
| 17. | ATV use has tourist-based economic benefits to local businesses and communities.  | 1.371  |
| 42. | One of the major issues with ATVs is that the motorized and non-motorized factions have unhealthy, deep suspicions and mistrusts of each others' motives.   | 1.359  |
| 56. | The MN DNR has improved its commitment to ensure that better control of ATV use in state lands is indeed fulfilled.   | 1.249  |
| 38. | Many environmentally friendly people ride ATVs in Minnesota public forests.   | 1.226  |
| 28. | I am impressed with the preparation and diligence of DNR personnel to ensure that ATV riders and other public land users co-exist.  | 1.175  |
| 1.  | Excessive noise of ATVs may result in harmful effects on animals and humans.  | 1.143  |
| 58. | The DNR uses sound natural resource and recreation management principles in addressing recreational challenges.   | 1.114  |
| 32. | I am comfortable with the fact that state forests are roaded and accessible, and have traditionally hosted a mix of motorized and non-motorized recreational opportunities.                         | 1.068  |
| 10. | The pleas of ATV riders, bolstered by industry backed lobby, is enough to sway career natural resource experts to compromise forest ecological integrity and the legitimate rights of silent users. | -0.961 |
| 33. | Minnesota's system of providing trails is bound to fail because anytime a new type of motorized recreation vehicle is created there is an automatic demand for their own special trail.             | -1.011 |
| 54. | There are as many conflicts between other forest road users, like hunters and horseback riders, hikers, etc.  | -1.101 |
| 5.  | Road and trail closure from ATV use discourages outdoor enthusiasts of a certain age and physical condition from enjoying nature.   | -1.102 |
| 36. | ATV trails provides a place for deer, coyotes and wolves to walk more easily.   | -1.204 |
| 60. | The DNR and environmental groups have done endless research, but in the end, ATV decisions are just up to someone with political gains to make.   | -1.210 |
| 15. | Ideally, there should be zero miles of rutted trails but the ruts are not as bad as ATV opponents would like people to believe; the damage caused by ATVs is highly overrated.                      | -1.241 |
| 8.  | I don't think the level of non-motorized use justifies the current acreage reserved for it.   | -1.267 |
| 41. | The fanatics are trying to keep ATVs away just so they can say that they saved the forest from uses other than what they view as right for the forest.  | -1.417 |
| 11. | There are enough places for "solitude-like" experiences in MN because State parks, and other units (Wildlife Management and Natural Areas), provide better opportunities for solitude.              | -1.577 |
| 23. | We don't need trail signs everywhere because area boundaries are typically well-defined and easily recognizable to ATV users.   | -1.686 |
| 9.  | I am painfully aware that ATV recreation does not have the numbers or the dollars that the enviro-extremists groups throw at this issue to sway the outcome.  | -1.706 |
| 40. | There is no place for motorized recreation in Minnesota public forests.   | -1.756 |
| 48. | Too much shutting down of ATV access in proposed areas is unfair because we have places like the Boundary Waters Canoe Area for remote wilderness experiences.                                      | -1.945 |

### *Stakeholders Associated with Perspective 2: “Stakeholder Mistrust”*

Those stakeholders whose sorts closely define the second perspective include, two members of the DNR office of management & budget services, one conservation officer, two members of DNR fish and wildlife, a private land owner, three low recreational use ATV riders, an ATV researcher, three non-motorized forest recreationists, three of the four members from DNR ecological resources, and a member of DNR forestry. Generally, 39 participants significantly agree with this perspective; there were no significant disagreements with this perspective. Refer to Table 4 for loadings of defining sorts (marked X) and individuals who significantly agree with this perspective.

### *Perspective 3: A Few Bad Apples: Unclear Rules/Signs*

This perspective believes that ATV riding is a legitimate use of public lands and is a source of family fun, economic benefits, and practical uses. The problem is with a small minority of irresponsible ATV riders and their “unlawful behaviors.” The MN DNR has generally done a good job managing ATV use, but there is significant room for improvement in clarifying permitted uses, clearer trail signs, etc. They think that unclear distinctions between minimum maintenance roads, ATV trails, and forest system roads partially explain ATV trail violations. They deny claims that ATV riders do not consider the true (full) ecological and social costs of ATV activity, including harmful effects on animals and humans, a viewpoint that markedly situates this perspective at odds with the other two. See Table 6 for statements defining this perspective.

*Table 6: Normalized Scores for Perspective 3*

| <b>No.</b> | <b>Statement</b>  | <b>Z-Scores</b> |
|------------|---|-----------------|
| 37.        | ATV riding, to many people, is not about slinging mud or tearing it up; it often means a vacation, a family outing.   | 1.785           |
| 17.        | ATV use has tourist-based economic benefits to local businesses and communities.  | 1.761           |
| 39.        | Like everything else, a few ATV riders give ATV riding a bad name.  | 1.719           |
| 38.        | Many environmentally friendly people ride ATVs in Minnesota public forests.   | 1.635           |
| 35.        | Walkers, bird watchers, etc. enjoy the forest and so should someone riding responsibly on an ATV.   | 1.625           |
| 32.        | I am comfortable with the fact that state forests are roaded and accessible, and have traditionally hosted a mix of motorized and non-motorized recreational opportunities. | 1.305           |
| 50.        | All forms of recreational trail use carry with them the potential for negative environmental effects.   | 1.272           |
| 49.        | The problem is not so much about having ATVs in the forest; it is about the unlawful behaviors of some riders.  | 1.204           |
| 19.        | ATVs are useful for hunting and the retrieval of game carcasses from hard-to-get-to areas.  | 1.135           |
| 4.         | I believe in preservation of our woods and wetlands, but not to the exclusion of  | 1.055           |

|     |   |        |
|-----|---|--------|
|     | other taxpayers.  |        |
| 47. | A few passing ATVs does not drive wildlife out of the area; wildlife only go a short distance into the forest.  | 1.035  |
| 25. | Some ATV trail violations are because the distinction between forest minimum maintenance roads, ATV trails, and forest system roads are not clear to ATV riders.                                    | 0.983  |
| 31. | ATV groups claim that they can police their members, but the unrestrained damage caused by riders shows that ATV groups are ineffective in policing their members.                                  | -0.950 |
| 6.  | The motorized to non motorized mileage ratio for state forests is heavily weighted towards motorized proponents.  | -1.045 |
| 10. | The pleas of ATV riders, bolstered by industry backed lobby, is enough to sway career natural resource experts to compromise forest ecological integrity and the legitimate rights of silent users. | -1.067 |
| 1.  | Excessive noise of ATVs may result in harmful effects on animals and humans.  | -1.073 |
| 24. | Trail signs are clear as to where ATVs are allowed and not allowed.   | -1.139 |
| 33. | Minnesota's system of providing trails is bound to fail because anytime a new type of motorized recreation vehicle is created there is an automatic demand for their own special trail.             | -1.142 |
| 13. | The DNR has given into the "big business" and "money talks" pressures that come from the manufacturers of these machines and those who can afford to ride them.                                     | -1.203 |
| 59. | Most ATV riders are from the Twin Cities; why does northern MN have to provide the playground for them?   | -1.408 |
| 22. | The MN DNR create problems and increase ATV damage to our forest trails by designating far more miles of trails than they have resources to enforce.  | -1.445 |
| 26. | The current permitted uses in state/federal forests roads and trails are clear and easy to know what is allowed where.  | -1.475 |
| 34. | ATV riders do not pay the true cost of their sport: erosion, water quality, wildlife etc.   | -1.600 |
| 23. | We don't need trail signs everywhere because area boundaries are typically well-defined and easily recognizable to ATV users.   | -1.612 |
| 40. | There is no place for motorized recreation in Minnesota public forests.   | -2.113 |

### *Stakeholders Associated with Perspective 3: "A Few Bad Apples"*

Those whose sorts closely define perspective three include, three low recreational use ATV riders, four high recreational use riders, eight ATV club members, two members from FOR, and three members of PATT. In general, 44 participants significantly agree with this perspective. Those who significantly disagree with this perspective include two private land owners and a high recreational use ATV rider. Refer to Table 4 for loadings of defining sorts (marked X) and individuals who significantly agree or disagree with this perspective.

### *Comparing Problem Frames*

For the problem frame perspectives, there were 28 multiple positive loaders, i.e., 28 individuals who saw more than one side of the issue. Two were triple positive loaders, i.e., individuals who significantly agreed with all three perspectives; a county recreation planner and an ATV

researcher. They were 26 double positive loaders, i.e., 26 individuals who significantly agreed with two perspectives. Of the 26 double positive loaders, 14 significantly agreed with both perspectives 1 and 2, while 12 agreed with both perspectives 2 and 3. Of the 26 double positive loaders, 20 were from the DNR, 60% of whom agreed with both perspectives 1 and 2, and 40% with perspectives 2 and 3. There were three non-loaders, i.e., individuals who did not significantly agree or disagree with any perspective, we contemplated using manual or judgmental rotation to bring these individuals' perspectives into focus (following Brown, 1980) but decided to exclude the researchers' subjectivity from the outcome. Refer to Table 4 for individuals with multiple loadings.

Besides the triple loaders, none of the participants agreed with both perspectives 1 and 3, highlighting the high level of disagreement between these two perspectives (highly negative inter-perspective association). Perspective 2 is somewhat in the middle, agreeing with both perspectives 1 and 2 (somewhat positive inter-perspective associations with both perspectives 1 and 3). See Table 7 for inter-perspective correlations. These correlations are computed from the standardized Z-scores for each perspective.

*Table 7: Inter-Perspective Correlation*

| <b>Perspective</b> | <b>1</b>     | <b>2</b> | <b>3</b> |
|--------------------|--------------|----------|----------|
| <b>1</b>           | 1.00         |          |          |
| <b>2</b>           | 0.33         | 1.00     |          |
| <b>3</b>           | <b>-0.45</b> | 0.26     | 1.00     |

All three perspectives agree with the statement that “The lack of agreement on recommendations calling for protection of natural resources in the ATV management process stands in the way of a better ATV system in MN for the future.” Although the level of agreement is low (see Tables 8 and 9 for Z scores for each perspective), this was the only Q-defined consensus statement for the problem frame. According to Q, a consensus is reached when all perspectives unanimously agree or disagree with a statement and their levels of agreement or disagreement are significantly indifferent.

*Table 8: Consensus Statements; Those That Do Not Distinguish Between ANY Pair of Perspectives; Statement is Non-Significant at  $P > .01$ ; \* indicates statement is also Non-Significant at  $P > .05$ .*

| <b>No.</b> | <b>Statement</b>  | <b>Perspective:</b>      |                          |                          |
|------------|---|--------------------------|--------------------------|--------------------------|
|            |   | <b>1<br/>Z<br/>Score</b> | <b>2<br/>Z<br/>Score</b> | <b>3<br/>Z<br/>Score</b> |
| 18.        | * The lack of agreement on recommendations calling for protection of natural resources in the ATV management process stands in the way of a better ATV system in MN for the future. | 0.54                     | 0.52                     | 0.45                     |

In practice, people might have a consensus without necessarily having the same level of agreement or disagreement. Thus, besides the Q-defined consensus, all three perspectives

unanimously, but varyingly, agree with the following statements: (i) there are too many uncoordinated factions (feds, state, county) who make ATV rules and that is confusing to riders (statement no. 27, Table 9); (ii) ATVs are useful for hunting and the retrieval of game carcasses from hard-to-get-to areas (statement no. 19); (iii) One of the major issues with ATVs is that the motorized and non-motorized factions have unhealthy, deep suspicions and mistrusts of each others' motives (statement no. 42); and (iv) All forms of recreational trail use carry with them the potential for negative environmental effects (statement no. 50).

All three perspectives disagree, though varyingly so, with the following statements: (i) we don't need trail signs everywhere because area boundaries are typically well-defined and easily recognizable to ATV users (statement no. 23); (ii) The current permitted uses in state/federal forest roads and trails are clear and easy to know what is allowed where (statement no. 26); (iii) I don't think the level of non-motorized use justifies the current acreage reserved for it (statement no. 8); (iv) There is no place for motorized recreation in Minnesota public forests (statement no. 40). In total, there is some level of consensus, among all three perspectives, on 9 of the 60 statements about the problem(s) with ATV use in MN state forest lands. See Table 9 for finer distinctions and similarities among perspectives.

There are three highly contentious issues with the problem frames. The first one is with regards to the behavior of ATV riders and the social and ecological costs of ATV activity. Perspectives 1 and 2 strongly believe that 'ATV riders do not pay the true cost of their sport' and that ATV riders' feeling of entitlement to ATV use is not matched by a corresponding responsibility for ATV-caused damages; perspective 3 strongly disagrees with these claims. While perspectives 1 and 2 strongly disagree with claims that ATV-caused damages are 'overrated', perspectives 3 somewhat agrees with that claim. A second area of contention is with regard to the role that the DNR plays in the ATV management process and whether such role sufficiently protects the environment and is not tainted by political and economic influences. Perspectives 2 and 3 see the DNR's role as favorable while perspective 1 is highly critical of the DNR's role in the planning and management of ATVs in state forest lands. The third contentious issue is the claim that 'there are enough places for solitude-like experiences in MN'; perspectives 1 and 2 strongly disagree with this claim, while perspective 3 somewhat agrees with it.

*Table 9: Normalized Values for Statements sorted by Consensus vs. Disagreement.*

|            | <b>Perspectives</b>   | <b>1</b>           | <b>2</b>           | <b>3</b>           |
|------------|---|--------------------|--------------------|--------------------|
| <b>No.</b> | <b>Statement</b>  | <b>Z<br/>Score</b> | <b>Z<br/>Score</b> | <b>Z<br/>Score</b> |
| 18.        | The lack of agreement on recommendations calling for protection of natural resources in the ATV management process stands in the way of a better ATV system in MN for the future. | 0.54               | 0.52               | 0.45               |
| 20.        | ATV users sometimes trespass because there are no connecting roads to get to the trails, especially when other roads and trails are nearby.                                       | -0.12              | -0.001             | 0.29               |
| 3.         | For people who want to visit their buddy down the road at the cabin, ATVs are a lot cheaper and cleaner way to travel than using a car.   | -0.49              | -0.20              | 0.16               |

|     |  |       |       |       |
|-----|--|-------|-------|-------|
| 23. | We don't need trail signs everywhere because area boundaries are typically well-defined and easily recognizable to ATV users.  | -1.06 | -1.69 | -1.61 |
| 30. | We can't make thousands more miles of trails, but overly limited riding areas get torn up faster and riders look even worse to the environmentalists.  | -0.45 | -0.19 | 0.32  |
| 27. | There are too many uncoordinated factions (feds, state, county) who make ATV rules and that is confusing to riders.  | 0.07  | 0.34  | 0.89  |
| 19. | ATVs are useful for hunting and the retrieval of game carcasses from hard-to-get-to areas.   | 0.20  | 0.45  | 1.14  |
| 26. | The current permitted uses in state/federal forests roads and trails are clear and easy to know what is allowed where.   | -0.79 | -0.52 | -1.47 |
| 8.  | I don't think the level of non-motorized use justifies the current acreage reserved for it.  | -0.78 | -1.27 | -0.28 |
| 2.  | Motorized recreation helps maintain the logging trails and fire prevention roads.  | -0.85 | -0.41 | 0.16  |
| 42. | One of the major issues with ATVs is that the motorized and non-motorized factions have unhealthy, deep suspicions and mistrusts of each others' motives.                                    | 0.38  | 1.36  | 0.45  |
| 24. | Trail signs are clear as to where ATVs are allowed and not allowed.  | -0.48 | 0.05  | -1.14 |
| 25. | Some ATV trail violations are because the distinction between forest minimum maintenance roads, ATV trails, and forest system roads are not clear to ATV riders.                             | -0.16 | 0.08  | 0.98  |
| 52. | People who hunt with ATVs can carry bait deeper into the forest, which gives them unfair advantage over other hunters.   | 0.16  | 0.17  | -0.93 |
| 54. | There are as many conflicts between other forest road users, like hunters and horseback riders, hikers, etc.   | -0.65 | -1.10 | 0.16  |
| 5.  | Road and trail closure from ATV use discourages outdoor enthusiasts of a certain age and physical condition from enjoying nature.  | -1.09 | -1.10 | 0.02  |
| 14. | Limiting ATV use to certain dates (Memorial Day to Labor Day) irrespective of on-the-ground conditions is unfair; it significantly shortens the season and hurts a wonderful family pastime. | -0.79 | -0.49 | 0.51  |
| 55. | Sure there are few bad apples in the ATV riding crowd, but that applies to any vehicle, piece of machinery, or material object that can be used.   | -0.54 | -0.09 | 0.85  |
| 51. | I think lack of enforcement of ATV riders is the biggest problem.  | 0.63  | 0.04  | -0.83 |
| 49. | The problem is not so much about having ATVs in the forest; it is about the unlawful behaviors of some riders.   | -0.24 | 0.73  | 1.20  |
| 50. | All forms of recreational trail use carry with them the potential for negative environmental effects.  | 0.14  | 1.53  | 1.27  |
| 36. | ATV trails provides a place for deer, coyotes and wolves to walk more easily.  | -0.54 | -1.20 | 0.29  |
| 53. | Private land owners in neighboring public forests are subjected to excessive ATV abuse on their property.  | 0.69  | 0.58  | -0.67 |
| 57. | No respect by ATV riders is a big problem, especially the teenage to upper 30-year-old thrill seekers.   | 1.04  | 0.68  | -0.41 |
| 33. | Minnesota's system of providing trails is bound to fail because anytime a new type of motorized recreation vehicle is created there is an automatic demand for their own special trail.      | 0.26  | -1.01 | -1.14 |
| 43. | Without a clear statement that says the DNR must put the   | 1.23  | 0.00  | -0.28 |

|     |  |       |       |       |
|-----|--|-------|-------|-------|
|     | environment first, the ATV program will continue to face criticism, opposition and obstruction from environmentalists.   |       |       |       |
| 40. | There is no place for motorized recreation in Minnesota public forests.  | -0.54 | -1.76 | -2.11 |
| 35. | Walkers, bird watchers, etc. enjoy the forest and so should someone riding responsibly on an ATV.  | -0.04 | 0.62  | 1.63  |
| 59. | Most ATV riders are from the Twin Cities; why does northern MN have to provide the playground for them?  | 0.25  | -0.80 | -1.41 |
| 4.  | I believe in preservation of our woods and wetlands, but not to the exclusion of other taxpayers.  | -0.35 | -0.48 | 1.05  |
| 32. | I am comfortable with the fact that state forests are roaded and accessible, and have traditionally hosted a mix of motorized and non-motorized recreational opportunities.              | -0.32 | 1.07  | 1.31  |
| 21. | There is inadequate enforcement of ATV abuses, so violators have little incentive to obey laws.  | 1.24  | 0.51  | -0.52 |
| 38. | Many environmentally friendly people ride ATVs in Minnesota public forests.  | -0.13 | 1.23  | 1.64  |
| 46. | Having motorized and silent users share the same recreational areas in state forests show either ignorance or disregard for the user conflict and the obvious solutions to the conflict. | 0.97  | -0.41 | -0.79 |
| 16. | It is ironic that there is a special trail for every type of motorized recreation vehicle, yet solitude recreationists are expected to share the forest with ATV riders.                 | 0.92  | 0.54  | -0.88 |
| 44. | The penalties for ATV violations are not severe enough to prevent ATV riders' misbehaviors.  | 1.27  | 0.67  | -0.61 |
| 6.  | The motorized to non motorized mileage ratio for state forests is heavily weighted towards motorized proponents.   | 0.80  | 0.35  | -1.05 |
| 12. | The answers to ATV problems seem obvious but no one is bold enough to make the decisions without being politically swayed.   | 1.40  | -0.10 | -0.43 |
| 37. | ATV riding, to many people, is not about slinging mud or tearing it up; it often means a vacation, a family outing.  | -0.20 | 0.70  | 1.79  |
| 17. | ATV use has tourist-based economic benefits to local businesses and communities.   | -0.15 | 1.37  | 1.76  |
| 39. | Like everything else, a few ATV riders give ATV riding a bad name.   | -0.20 | 0.16  | 1.72  |
| 47. | A few passing ATVs does not drive wildlife out of the area; wildlife only go a short distance into the forest.   | -0.86 | -0.70 | 1.04  |
| 41. | The fanatics are trying to keep ATVs away just so they can say that they saved the forest from uses other than what they view as right for the forest.                                   | -1.45 | -1.42 | 0.40  |
| 9.  | I am painfully aware that ATV recreation does not have the numbers or the dollars that the enviro-extremists groups throw at this issue to sway the outcome.                             | -1.34 | -1.71 | 0.45  |
| 45. | As humans, we have lost something if we cannot maintain the peaceful solitude of the forest.   | 1.52  | 1.45  | -0.54 |
| 48. | Too much shutting down of ATV access in proposed areas is unfair because we have places like the Boundary Waters Canoe Area for remote wilderness experiences.                           | -1.55 | -1.94 | 0.30  |
| 1.  | Excessive noise of ATVs may result in harmful effects on animals and humans.   | 0.85  | 1.14  | -1.07 |
| 15. | Ideally, there should be zero miles of rutted trails but the ruts are not  | -1.60 | -1.24 | 0.67  |

|     |   |       |       |       |
|-----|---|-------|-------|-------|
|     | as bad as ATV opponents would like people to believe; the damage caused by ATVs is highly overrated.  |       |       |       |
| 31. | ATV groups claim that they can police their members, but the unrestrained damage caused by riders shows that ATV groups are ineffective in policing their members.                                  | 1.56  | 0.47  | -0.95 |
| 11. | There are enough places for "solitude-like" experiences in MN because State parks, and other units (Wildlife Management and Natural Areas), provide better opportunities for solitude.              | -1.75 | -1.58 | 0.54  |
| 7.  | Part of the problem with ATVs is the feeling of entitlement on the part of ATV users without a corresponding acceptance of responsibility for damage caused to the environment.                     | 1.52  | 1.55  | -0.71 |
| 28. | I am impressed with the preparation and diligence of DNR personnel to ensure that ATV riders and other public land users co-exist.  | -1.41 | 1.18  | 0.51  |
| 10. | The pleas of ATV riders, bolstered by industry backed lobby, is enough to sway career natural resource experts to compromise forest ecological integrity and the legitimate rights of silent users. | 1.32  | -0.96 | -1.07 |
| 60. | The DNR and environmental groups have done endless research, but in the end, ATV decisions are just up to someone with political gains to make.   | 1.39  | -1.21 | -0.61 |
| 56. | The MN DNR has improved its commitment to ensure that better control of ATV use in state lands is indeed fulfilled.   | -1.34 | 1.25  | 0.72  |
| 58. | The DNR uses sound natural resource and recreation management principles in addressing recreational challenges.   | -1.58 | 1.11  | 0.27  |
| 13. | The DNR has given into the "big business" and "money talks" pressures that come from the manufacturers of these machines and those who can afford to ride them.                                     | 1.52  | -0.92 | -1.20 |
| 29. | The DNR is looking to our future and is committed to protecting the integrity of Minnesota public forests.  | -1.37 | 1.50  | 0.85  |
| 22. | The MN DNR create problems and increase ATV damage to our forest trails by designating far more miles of trails than they have resources to enforce.  | 1.64  | -0.60 | -1.45 |
| 34. | ATV riders do not pay the true cost of their sport: erosion, water quality, wildlife etc.   | 1.67  | 1.66  | -1.60 |

# Management Frames: Three Options

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The question as to how we should or should not manage ATVs in MN state forest lands was also framed into three distinct management options, discussed in this section.

## *Perspective A: Professional, Scientific Management*

This is a pro-management perspective and includes strong disagreement with the view that the ATV issue will fix itself with time. Those who hold this perspective believe ATV trail planning and management should be informed by ecological expertise and ought to include setting aside large ATV-free areas. They believe that effective management and minimization of ecological damage requires avoiding political influences; sufficient enforcement; adequate funding; including ATV user fees for trail maintenance and enforcement. Holders of this perspective believe the idea of multiple uses is unreasonable, and the environment and other types of forest recreation could be negatively affected by increased ATV activity. To avoid the spread of illegal trails, those who hold this perspective believe it is better to post signs on trails that are open rather than those that are closed.

Holders of this perspective are against the “managed” designation, and creating more trails and loops, including ATV use of logging roads, to minimize ATV damages. They do not support multiple use of trails by ATVs and snowmobiles (summer and winter, respectively), and are against the idea that trails signs should be posted only where necessary because the biophysical setting of forest lands facilitates trail recognition by ATV riders. Those who hold this perspective do not think that overly stringent restrictions on ATV activity will have negative economic consequences. See Table 10 for normalized scores for the statements that define this perspective.

*Table 10: Normalized Scores for Perspective A*

| No. | Statement  | Z Score |
|-----|--|---------|
| 10. | It is wisest to allow ATV traffic only in areas that professional foresters and ecologists designate as suitable.  | 1.862   |
| 12. | We need to set aside large ATV-free areas, as has been done in some federal parks and forests.   | 1.780   |
| 36. | To find a good statewide solution to the ATV problem, we need to be bold enough to make the decisions without being politically swayed.  | 1.759   |
| 5.  | Sufficient enforcement is needed to prohibit unauthorized ATV use.   | 1.510   |
| 17. | Opening more areas to ATV traffic will only increase violations and cause more environmental destruction.  | 1.484   |
| 26. | When an ATV goes off-trail it creates a new trail and if that new trail is unmarked, other ATVs will follow, so it is better to post trails that are open for ATV use rather than those which are not. | 1.463   |
| 44. | Without adequate funding, the DNR will not be able to implement any of the badly needed improvements in trail maintenance, repair and enforcement.   | 1.022   |

|     |  |        |
|-----|--|--------|
| 38. | If ATV use is further encouraged in forests, other types of recreation and the revenue generated from them could suffer.   | 0.998  |
| 1.  | Fees should be charged to all ATV users for trail upkeep and enforcement.  | 0.986  |
| 51. | The notion of ‘multiple uses’, or sharing public lands, is not a reasonable way to manage ATV riders and other forest users.   | 0.950  |
| 13. | Low-maintenance roads connecting to sections of higher standard roads to create loops and destination points will help reduce ATV damage and off-trail violations.         | -0.983 |
| 18. | If creating more ATV trails meant it would keep them off other public roadways, town roads, and county roads, I would be supportive.                                       | -1.142 |
| 41. | The Managed designation is the best for all parties involved because this way if the DNR feels the trails are too wet or have been used too much they can close them down. | -1.169 |
| 25. | Signs should be posted only where necessary because area boundaries are typically well defined and easily recognizable to ATV riders.                                      | -1.201 |
| 23. | I support multiple uses of trails by snowmobiles and ATVs; in the summer ATV use trails to help keep brush down and in winter snowmobiles use them.                        | -1.222 |
| 29. | Other forest users need to get the message that these forests are multi-use and that certain areas are going to have some noise and erosion from ATV use.                  | -1.541 |
| 19. | Recreational use of abandoned logging roads should be allowed; it will reduce ATV traffic and impacts as legal trails are becoming fewer and fewer.                        | -1.572 |
| 16. | Enough trails would help keep ATV use out of ditches, wetlands, and other sensitive areas.   | -1.638 |
| 37. | In times of economic hardship like now, the economic impact would be huge if overly stringent restrictions are placed on ATV riding.                                       | -1.683 |
| 43. | The ATV issue will self-correct in future years.   | -2.113 |

*Stakeholders Associated with Perspective A: “Professional, Scientific Management”*

There were 29 defining sorts, including three low recreational riders, three non-motorized forest recreationists, all four environmental advocates, five members of DNR fish & wildlife, three of the four members of DNR ecological resources, a member of DNR office of management & budget services, three private land owners, two DNR conservation officers, a member of DNR forestry, two members of DNR parks and trails, parks section, a high recreational ATV rider, and a county recreation planner/manager. In general, 50 individuals significantly agree with this perspective; six individuals significantly disagree, including a high recreational ATV rider, a low recreational ATV rider, three ATV club members and a member of DNR parks and trails, trails section. See Table 11 for loadings of defining sorts (marked X) and individuals who significantly agree or disagree with this perspective (in bold; a positive loading signifies agreement while a negative loading signifies disagreement).

Table 11: Table of Loading Scores; X Indicate Defining Sorts; Bold Indicate Significant Loadings

| No. | Q Sorts/Participants                 | A            | B            | C            |
|-----|--------------------------------------|--------------|--------------|--------------|
|     | Perspectives                         |              |              |              |
| 1.  | DNR OMBS 02                          | <b>0.72X</b> | 0.05         | -0.08        |
| 2.  | DNR OMBS 03                          | <b>0.43</b>  | 0.30         | -0.24        |
| 3.  | DNR OMBS 04                          | <b>0.47</b>  | <b>0.58X</b> | 0.18         |
| 4.  | DNR OMBS 05                          | 0.28         | 0.12         | 0.06         |
| 5.  | DNR FAW 01                           | <b>0.72X</b> | 0.14         | 0.13         |
| 6.  | DNR FAW 02                           | <b>0.63X</b> | -0.01        | 0.13         |
| 7.  | DNR FAW 03                           | <b>0.37</b>  | 0.02         | 0.13         |
| 8.  | DNR FAW 04                           | <b>0.61X</b> | 0.21         | <b>0.34</b>  |
| 9.  | DNR FAW 05                           | -0.001       | 0.23         | 0.19         |
| 10. | DNR FAW 06                           | <b>0.70X</b> | -0.10        | 0.08         |
| 11. | DNR FAW 07                           | <b>0.83X</b> | 0.01         | -0.01        |
| 12. | DNR FAW 08                           | <b>0.46</b>  | 0.20         | 0.16         |
| 13. | DNR FAW 10                           | <b>0.48</b>  | 0.15         | 0.04         |
| 14. | DNR FAW 11                           | 0.17         | <b>0.57X</b> | -0.07        |
| 15. | “ ENF01                              | <b>0.54X</b> | 0.17         | 0.17         |
| 16. | “ ENF03                              | <b>0.44</b>  | -0.15        | <b>0.43</b>  |
| 17. | “ ENF04                              | <b>0.51</b>  | 0.30         | 0.12         |
| 18. | “ ENF05                              | <b>0.34</b>  | 0.14         | <b>0.41</b>  |
| 19. | “ ENF06                              | 0.05         | <b>0.72X</b> | 0.26         |
| 20. | “ ENF07                              | <b>0.66X</b> | -0.002       | <b>0.43</b>  |
| 21. | “ ENF08                              | <b>0.37</b>  | 0.20         | 0.31         |
| 22. | “ FOR01                              | 0.08         | 0.26         | <b>0.67X</b> |
| 23. | “ FOR02                              | 0.32         | 0.16         | 0.29         |
| 24. | “ FOR03                              | 0.23         | 0.07         | <b>0.64X</b> |
| 25. | “ FOR04                              | 0.29         | 0.22         | <b>0.37</b>  |
| 26. | “ FOR05                              | 0.28         | -0.08        | 0.01         |
| 27. | “ FOR06                              | 0.23         | 0.20         | 0.21         |
| 28. | “ FOR07                              | <b>0.66X</b> | <b>-0.42</b> | 0.13         |
| 29. | “ FOR08                              | <b>0.60</b>  | 0.02         | <b>0.45</b>  |
| 30. | “ FOR09                              | 0.15         | <b>0.34</b>  | 0.13         |
| 31. | “ FOR11                              | -0.14        | -0.05        | 0.30         |
| 32. | “ PATT01                             | -0.28        | <b>0.43</b>  | <b>0.65X</b> |
| 33. | “ PATP03                             | <b>0.66X</b> | -0.10        | 0.04         |
| 34. | “ PATP04                             | <b>0.54X</b> | 0.004        | 0.17         |
| 35. | “ PATP05                             | 0.21         | 0.18         | <b>0.42</b>  |
| 36. | “ PATT06                             | <b>-0.37</b> | 0.32         | <b>0.52</b>  |
| 37. | “ PATT07                             | 0.16         | 0.25         | <b>0.53</b>  |
| 38. | “ PATT09                             | 0.08         | <b>0.67X</b> | 0.29         |
| 39. | “ ECR01                              | 0.29         | 0.26         | 0.19         |
| 40. | “ ECR02                              | <b>0.83X</b> | -0.01        | 0.06         |
| 41. | “ ECR03                              | <b>0.68X</b> | 0.11         | -0.01        |
| 42. | “ ECR04                              | <b>0.61X</b> | 0.09         | 0.03         |
| 43. | County Recreation Manager/Planner 01 | -0.13        | <b>0.60X</b> | 0.19         |
| 44. | County Recreation Manager/Planner 02 | 0.19         | 0.13         | <b>0.59X</b> |

|     |   |              |               |              |
|-----|---|--------------|---------------|--------------|
| 45. | County Recreation Manager/Planner 03      | 0.16         | 0.21          | <b>0.38</b>  |
| 46. | County Recreation Manager/Planner 04      | <b>0.48X</b> | 0.03          | 0.13         |
| 47. | ATV Club Member 01                        | <b>-0.37</b> | <b>0.49</b>   | 0.32         |
| 48. | ATV Club Member 02                        | 0.10         | <b>0.37</b>   | <b>0.61X</b> |
| 49. | ATV Club Member 05                        | -0.15        | <b>0.73X</b>  | 0.26         |
| 50. | ATV Club Member 06                        | 0.16         | 0.31          | 0.05         |
| 51. | ATV Club Member 07                        | -0.05        | <b>0.49</b>   | 0.26         |
| 52. | ATV Club Member 09                        | <b>-0.35</b> | <b>0.62X</b>  | <b>0.35</b>  |
| 53. | ATV Club Member 10                        | -0.18        | 0.27          | -0.06        |
| 54. | ATV Club Member 13                        | <b>-0.35</b> | <b>0.51X</b>  | -0.02        |
| 55. | Non-motorized forest recreationist 03     | <b>0.73X</b> | 0.10          | 0.06         |
| 56. | Non-motorized forest recreationist 04     | <b>0.50</b>  | 0.03          | 0.10         |
| 57. | Non-motorized forest recreationist 05     | 0.004        | <b>0.37</b>   | 0.14         |
| 58. | Non-motorized forest recreationist 06     | -0.03        | <b>0.39</b>   | <b>0.34</b>  |
| 59. | Non-motorized forest recreationist 07     | <b>0.76X</b> | -0.22         | -0.07        |
| 60. | Non-motorized forest recreationist 09     | <b>0.85X</b> | -0.15         | 0.01         |
| 61. | Non-motorized forest recreationist 10     | <b>0.47</b>  | -0.15         | -0.05        |
| 62. | Non-motorized forest recreationist 11     | <b>0.40</b>  | 0.26          | 0.01         |
| 63. | Private land owner 1                      | <b>0.68X</b> | 0.05          | -0.12        |
| 64. | Private land owner 2                      | <b>0.78X</b> | -0.13         | -0.15        |
| 65. | Private land owner 3                      | 0.29         | <b>0.40</b>   | 0.06         |
| 66. | Private land owner 5                      | <b>0.34</b>  | -0.28         | 0.004        |
| 67. | Private land owner 6                      | <b>0.70X</b> | -0.09         | -0.06        |
| 68. | Private land owner 7                      | <b>0.51</b>  | -0.11         | 0.27         |
| 69. | Practical Rider, Low Recreational Use 01  | -0.14        | <b>0.50</b>   | 0.11         |
| 70. | Practical Rider, Low Recreational Use 02  | <b>0.42</b>  | 0.18          | 0.04         |
| 71. | Practical Rider, Low Recreational Use 03  | 0.33         | 0.28          | <b>0.35</b>  |
| 72. | Practical Rider, Low Recreational Use 05  | 0.13         | -0.01         | 0.09         |
| 73. | Practical Rider, Low Recreational Use 06  | <b>-0.39</b> | <b>0.45</b>   | 0.03         |
| 74. | Practical Rider, Low Recreational Use 07  | <b>0.47</b>  | 0.02          | 0.06         |
| 75. | Practical Rider, Low Recreational Use 08  | <b>0.59X</b> | -0.06         | 0.06         |
| 76. | Practical Rider, Low Recreational Use 09  | <b>0.87X</b> | -0.11         | -0.10        |
| 77. | Practical Rider, Low Recreational Use 10  | <b>0.47</b>  | 0.07          | 0.09         |
| 78. | Practical Rider, Low Recreational Use 11  | -0.25        | <b>0.58</b>   | -0.07        |
| 79. | Practical Rider, High Recreational Use 01 | -0.08        | <b>0.69X</b>  | 0.20         |
| 80. | Practical Rider, High Recreational Use 02 | -0.25        | 0.13          | -0.003       |
| 81. | Practical Rider, High Recreational Use 03 | <b>0.60X</b> | -0.08         | -0.02        |
| 82. | Practical Rider, High Recreational Use 04 | -0.11        | <b>0.58 X</b> | -0.11        |
| 83. | Balanced Rider, High Recreational Use 01  | -0.11        | <b>0.56X</b>  | 0.08         |
| 84. | Balanced Rider, High Recreational Use 02  | 0.05         | <b>0.50 X</b> | 0.10         |
| 85. | Balanced Rider, High Recreational Use 03  | <b>-0.43</b> | <b>0.59</b>   | 0.06         |
| 86. | Balanced Rider, High Recreational Use 04  | -0.19        | <b>0.37</b>   | <b>0.37</b>  |
| 87. | Balanced Rider, High Recreational Use 05  | -0.26        | <b>0.38</b>   | <b>0.53X</b> |
| 88. | Balanced Rider, Low Recreational Use 01   | <b>0.44</b>  | 0.20          | 0.13         |
| 89. | Balanced Rider, Low Recreational Use 03   | <b>0.80X</b> | -0.15         | 0.10         |
| 90. | Environmental Advocate 01                 | <b>0.78X</b> | -0.22         | 0.10         |
| 91. | Environmental Advocate 03                 | <b>0.84X</b> | 0.02          | 0.01         |
| 92. | Environmental Advocate 04                 | <b>0.74X</b> | -0.20         | -0.05        |
| 93. | Environmental Advocate 05                 | <b>0.76X</b> | 0.02          | 0.17         |

|     |                     |             |              |             |
|-----|---------------------|-------------|--------------|-------------|
| 94. | ATV Researcher 01   | -0.001      | <b>0.67X</b> | 0.27        |
| 95. | ATV Researcher 02   | <b>0.39</b> | 0.23         | 0.21        |
| 96. | ATV Researcher 03   | <b>0.38</b> | <b>0.62X</b> | 0.07        |
| 97. | ATV Researcher 04   | 0.25        | <b>0.67X</b> | <b>0.36</b> |
|     | % Explanatory power | 22          | 11           | 7           |

### *Perspective B: Fair, Balanced Sustainable Management*

Like perspective A, this perspective is pro-management; they strongly disagree that the ATV issue will fix itself with time. They emphasize fairness, balanced multiple use, and sustainable management. According to this perspective, ATV riding is a legitimate use of public lands that can be balanced with other uses through good management and compromise. All types of ATV riding (e.g., multiple skill levels, including challenging riding areas) should be accommodated on public lands.

Like perspective A, they disagree with claims that signs are not needed everywhere because the biophysical setting of forest lands facilitates ATV trail recognition. This perspective strongly disagrees with the idea that foresters and ecologists should inform trail designation. They think that more ATV activity will not increase ecological destruction or have negative impacts on other forms of forest recreation. See Table 12 for the Z scores of statements defining this perspective.

### *Stakeholders Associated with Perspective B “Fair, Balanced Sustainable Management”*

There were 15 defining sorts: three ATV club members, a DNR conservation officer, four high recreational ATV riders, three of four ATV researchers, a member of DNR parks and trails, trails section, a county recreation planner/manager, a member of DNR office of management & budget services, and a member of DNR fish & wildlife. In total, 30 individuals significantly agree with this perspective; one individual from FOR significantly disagreed with this perspective. Table 11 shows loadings of defining sorts (marked X) and individuals who significantly agree or disagree with this perspective.

*Table 12: Normalized Scores for Perspective B*

| No. | Statement   | Z Scores |
|-----|---|----------|
| 27. | I would like a balance of uses for all peoples' enjoyment and in a respectful manner. The Minnesota forest is a beautiful area and should be enjoyed by all.        | 2.044    |
| 54. | The most important goal should be sustainable resource management while being fair to all public forest users.  | 1.931    |
| 46. | The DNR should provide a system of environmentally sustainable trails that accommodates multiple skill levels and provides access to suitable riding opportunities. | 1.571    |
| 30. | Compromises can be found with enough ATV trails and solitude areas while protecting natural resources for future generations.                                       | 1.538    |

|     |   |        |
|-----|---|--------|
| 22. | Challenging riding areas should be located in all corners of the state, not just in north-central Minnesota, to disperse rather than concentrate severe impacts.                | 1.275  |
| 11. | The DNR should develop a system that spreads ridership throughout the state as a means to protect natural resources and meet appropriate recreational expectations.             | 1.027  |
| 55. | The statewide plan is too large; plans should be implemented on a local level by thinking globally and acting locally.  | -1.031 |
| 10. | It is wisest to allow ATV traffic only in areas that professional foresters and ecologists designate as suitable.   | -1.064 |
| 3.  | Thrill seeking ATV users should pay a thrill fee to support enforcement and trail repairs.  | -1.309 |
| 53. | Only normal ATV riding should be allowed in state forests; thrill riders should be restricted to private property.  | -1.398 |
| 17. | Opening more areas to ATV traffic will only increase violations and cause more environmental destruction.   | -1.435 |
| 38. | If ATV use is further encouraged in forests, other types of recreation and the revenue generated from them could suffer.  | -1.460 |
| 25. | Signs should be posted only where necessary because area boundaries are typically well defined and easily recognizable to ATV riders.   | -1.724 |
| 51. | The notion of 'multiple uses', or sharing public lands, is not a reasonable way to manage ATV riders and other forest users.  | -2.019 |
| 39. | In the spirit of free enterprise and entrepreneurship, we should limit ATV use to private lands; it will create jobs and confine ATVs to areas controlled by private interests. | -2.152 |
| 43. | The ATV issue will self-correct in future years.  | -2.191 |

### *Perspective C: Enforcement and Balanced/Multiple Use*

According to this perspective, stringent management, and sufficient enforcement and funding are needed for proper management of ATV use on public lands. Balance and compromise between motorized and non-motorized uses and users of public lands should be pursued. Like perspective B, management should provide a sustainable trail system, and emphasize fairness to all users of public lands. Holders of this perspective support connecting trails to local businesses to make obvious the economic contributions of ATV recreation. They would like ATV trails to be developed in urban areas; they advocate multiple use of trails for ATVs and snowmobiles, accommodation of multiple skill levels, and improving the accuracy of current ATV trail maps. They are for harmonization of the otherwise confusing rules where trails transcend federal, state, and county boundaries.

This perspective is against environmental assessment of trails and setting aside large ATV-free areas. Those who hold perspective C oppose citizen involvement in ATV management and the use of logging roads for ATV recreation. They do not think that increased ATV activity will have negative effects on the environment or on other forms of forest recreation. Like the other two perspectives, this one does not think that trail signs should not be posted everywhere because biophysical conditions facilitate ATV trail recognition by riders. See Table 13 for the Z-scores of statements defining this perspective.

*Stakeholders Associated with Perspective C “Enforcement & Balanced/Multiple Use”*

The sorts of six participants define this perspective including two members of DNR forestry, one from DNR parks & trails, trails section, an ATV club member, a county recreation planner/manager, and a high recreational ATV rider. In general, 21 individuals significantly agree with this perspective; no participants significantly disagree with this perspective. See Table 11 for loadings of defining sorts (marked X) and individuals who significantly agree or disagree with this perspective (in bold).

*Table 13: Normalized Scores for Perspective C*

| <b>No.</b> | <b>Statement</b>  | <b>Z Scores</b> |
|------------|---|-----------------|
| 5.         | Sufficient enforcement is needed to prohibit unauthorized ATV use.  | 1.761           |
| 54.        | The most important goal should be sustainable resource management while being fair to all public forest users.  | 1.713           |
| 27.        | I would like a balance of uses for all peoples' enjoyment and in a respectful manner. The Minnesota forest is a beautiful area and should be enjoyed by all.  | 1.654           |
| 15.        | Trails should include access to local businesses so that ATV riders can readily contribute to the local economy (gas, lodging, dining, etc.).   | 1.552           |
| 30.        | Compromises can be found with enough ATV trails and solitude areas while protecting natural resources for future generations.   | 1.340           |
| 28.        | Develop ATV trails in the urban areas.  | 1.292           |
| 23.        | I support multiple uses of trails by snowmobiles and ATVs; in the summer ATV use trails to help keep brush down and in winter snowmobiles use them.   | 1.279           |
| 31.        | In areas where the forest transcends federal, state and county boundaries, a committee of officials from the respective governments should be formed to harmonize the confusing rules that state, federal, and county governments make. | 1.263           |
| 6.         | ATV management should be stringent, with no gray areas.   | 1.160           |
| 46.        | The DNR should provide a system of environmentally sustainable trails that accommodates multiple skill levels and provides access to suitable riding opportunities.   | 1.157           |
| 24.        | The current maps of ATV trails are a good start but they will need to be improved to make them as accurate as possible.   | 1.117           |
| 44.        | Without adequate funding, the DNR will not be able to implement any of the badly needed improvements in trail maintenance, repair and enforcement.  | 1.096           |
| 12.        | We need to set aside large ATV-free areas, as has been done in some federal parks and forests.  | -0.985          |
| 39.        | In the spirit of free enterprise and entrepreneurship, we should limit ATV use to private lands; it will create jobs and confine ATVs to areas controlled by private interests.   | -1.005          |
| 48.        | A balanced citizens committee that meets regularly to consider ATV issues would help instill respect for different opinions and reduce mistrust of others' motives.   | -1.050          |
| 37.        | In times of economic hardship like now, the economic impact would be huge if overly stringent restrictions are placed on ATV riding.  | -1.194          |
| 3.         | Thrill seeking ATV users should pay a thrill fee to support enforcement and   | -1.295          |

|     |  |        |
|-----|--|--------|
|     | trail repairs.   |        |
| 32. | A permanent, balanced citizen committee made up of people willing to set aside suspicion and mistrust, which reports regularly to the legislature and the DNR about ATV issues, will help. | -1.303 |
| 19. | Recreational use of abandoned logging roads should be allowed; it will reduce ATV traffic and impacts as legal trails are becoming fewer and fewer.  | -1.318 |
| 38. | If ATV use is further encouraged in forests, other types of recreation and the revenue generated from them could suffer.   | -1.452 |
| 51. | The notion of ‘multiple uses’, or sharing public lands, is not a reasonable way to manage ATV riders and other forest users.   | -1.576 |
| 33. | A thorough environmental assessment of all state forest trails is essential to get those opposed to ATVs to be comfortable with trails development.  | -1.640 |
| 17. | Opening more areas to ATV traffic will only increase violations and cause more environmental destruction.  | -1.905 |
| 25. | Signs should be posted only where necessary because area boundaries are typically well defined and easily recognizable to ATV riders.  | -1.954 |

### *Comparing Management Options*

For the problem frame perspectives, there were 16 double positive loaders, i.e., 16 individuals who saw two sides of the issue. Of the 16 double positive loaders, six significantly agreed with both perspectives A and B, 18 agreed with both perspectives B and C, and two agreed with both perspectives A and B. Of the 16 double positive loaders, eight are from the DNR; five agreed with both perspectives A and C, two agreed with both perspectives B and C, and one agreed with both perspectives A and B. There were 11 non-loaders, i.e., individuals who did not significantly agree or disagree with any perspective. We did not use manual or judgmental rotation to bring these individuals’ perspectives into focus (following Brown, 1980) because we wanted the results to be free of our judgments. Refer to Table 4 for individuals with multiple loadings.

In general, there is a slight (but insignificant) disagreement between perspectives A and B; perspective 2 is somewhat in the middle, agreeing very strong with perspective C and somewhat with perspective A (positive inter-perspective associations with both perspectives A and C). See Table 14 for inter-perspective correlations, computed from the standardized Z-scores for each perspective.

*Table 14: Inter-Perspective Correlations*

|   | A     | B    | C    |
|---|-------|------|------|
| A | 1.00  |      |      |
| B | -0.01 | 1.00 |      |
| C | 0.06  | 0.62 | 1.00 |

There were four Q-defined consensus statements for management options. All three perspectives agree that: (i) there should be ATV speed limits where people feel it is dangerous or unsafe (statement no. 9); (ii) without adequate funding, the DNR will not be able to implement any of the badly needed improvements in trail maintenance, repair and enforcement (statement no. 44);

(iii) user fees to help manage the ATV problem would be great (statement no. 52). All perspectives disagree with the idea that signs to call DNR enforcement in case of an ATV violation will be helpful (statement no. 45). See Tables 15 and 16 for Z-scores for each perspective.

*Table 15: Consensus Statements: Those That Do Not Distinguish Between ANY Pair of Perspectives; All Listed Statements are Non-Significant at  $P > .01$ ; those with an \* are also Non-Significant at  $P > .05$ .*

| No. | Statement  | Perspective:    |                 |                 |
|-----|--|-----------------|-----------------|-----------------|
|     |  | A<br>Z<br>Score | B<br>Z<br>Score | C<br>Z<br>Score |
| 9   | *There should be ATV speed limits where people feel it is dangerous or unsafe.   | 0.61            | 0.57            | 0.47            |
| 44. | * Without adequate funding, the DNR will not be able to implement any of the badly needed improvements in trail maintenance, repair and enforcement. | 1.02            | 0.79            | 1.10            |
| 45. | Signs to call DNR enforcement in case of an ATV violation would help reduce misbehavior of ATV riders.   | -0.02           | -0.03           | -0.47           |
| 52. | User fees to help manage the ATV problem would be great.   | 0.49            | 0.18            | 0.01            |

Besides the Q-defined consensus statements, all three perspectives unanimously, but varyingly, agree with the views that effective management would entail: (i) that opening and closing dates for ATV activity be determined by on-the-ground conditions (statement no. 42, Table 16); (ii) sufficient enforcement (no. 5); (iii) harmonization of confusing rules in areas where trails transcend federal, state, and county boundaries (no. 31); (iv) avoidance of political influences on ATV planning and management efforts (no. 36); (v) improved accuracy of ATV trail maps (no. 24); (vi) that sustainable resource management, while being fair to all forest users, should be the most important goal (no. 54); and (vii) a balance of uses for the enjoyment of all (statement no. 27, Table 16).

All three perspectives unanimously disagree, though varyingly so, with claims that: (i) ATV issues will self-correct with time (statement no. 43, Table 16); (ii) that enough trails will eliminate ATV destruction (no. 16); (iii) thrill seekers should pay a thrill-seeking fee to support enforcement and trail maintenance (no. 3); (iv) the managed designation is the best approach (no. 41); (v) creating more ATV trails (no. 18); (vi) overly stringent restrictions on ATV activity will have huge economic impact (no. 37); (vii) the statewide plan is too large (no. 55); and (viii) signs should be posted only where necessary because area boundaries are typically well defined (no. 25). In total, there is varied level of consensus, among all three perspectives, on 19 of the 55 issues with how we should or not manage ATVs in MN state forest lands. See Table 16 for finer distinctions and similarities among perspectives.

There are two major contentious areas in the management frame. The first regards claims that increased ATV activity will increase violations and negatively impact other forms of forest

recreation. Perspective A strongly agrees with these claims while perspectives B and C strongly disagree with them. The second area of quarrel in the management frame is with regards to the notion of ‘multiple use’, where ATVs should be allowed and under what conditions. Perspectives B and C very much support the notion of multiple use while perspective A is somewhat against it. Perspectives A and C agree that ATV traffic should be allowed only in areas judged as suitable by professional foresters and ecologists’ while perspective B disagrees with it. Perspectives A and C strongly disagrees with claims that ATV use of abandoned logging roads will help minimize ATV damage while perspective B somewhat agrees with this claim. Perspectives B and C will like ATV trails to include access to local businesses to facilitate riders’ contribution to local economies while perspective A is against it. Perspectives A and B both agree that it is better to post signs on trails that are open rather than those which are closed because when an ATV goes off-trail it creates an unmarked new trail; perspective C disagrees with these claims. Perspectives A and C agree that ‘ATV management should be stringent with no grey areas’ while perspective B disagrees with that request. Perspective B and C are in support of, an ambassador type program to assist with safety, education and monitoring and, the development of a system spreading ridership throughout the state as a means to protect resources and meet recreational demands. Perspective A is against these two claims.

*Table 16: Normalized Scores for Statements sorted by Consensus vs. Disagreement*

|            | <b>Perspectives:</b>   | <b>A</b> | <b>B</b> | <b>C</b> |
|------------|--|----------|----------|----------|
| <b>No.</b> | <b>Statement</b>   |          |          |          |
| 9.         | There should be ATV speed limits where people feel it is dangerous or unsafe.  | 0.61     | 0.57     | 0.47     |
| 44.        | Without adequate funding, the DNR will not be able to implement any of the badly needed improvements in trail maintenance, repair and enforcement.                   | 1.02     | 0.79     | 1.10     |
| 52.        | User fees to help manage the ATV problem would be great.   | 0.49     | 0.18     | 0.01     |
| 45.        | Signs to call DNR enforcement in case of an ATV violation would help reduce misbehavior of ATV riders.   | -0.02    | -0.03    | -0.47    |
| 35.        | Enforcement of ATVs is difficult, so education is our best bet.  | -0.54    | 0.12     | -0.06    |
| 8.         | The DNR should increase its commitment to ATV education.   | 0.10     | -0.12    | 0.56     |
| 42.        | Opening and closing dates for ATV riding season are better dictated by seasonal on the ground conditions, rather than the fixed Memorial Day to Labor Day datelines. | 0.55     | 0.78     | 0.08     |
| 4.         | Snowmobilers took great pains to address some of their problems - ATV riders should do the same.   | -0.15    | 0.56     | 0.37     |
| 25.        | Signs should be posted only where necessary because area boundaries are typically well defined and easily recognizable to ATV riders.                                | -1.20    | -1.72    | -1.95    |
| 55.        | The statewide plan is too large; plans should be implemented on a local level by thinking globally and acting locally.   | -0.54    | -1.03    | -0.26    |
| 37.        | In times of economic hardship like now, the economic impact would be huge if overly stringent restrictions are placed on ATV riding.                                 | -1.68    | -0.80    | -1.19    |
| 14.        | If trails were maintained properly and frequently the damage   | -0.69    | 0.04     | 0.14     |

|     |   |       |       |       |
|-----|---|-------|-------|-------|
|     | from ATVs would be less visually distasteful and provocative to non-motorized recreationists.   |       |       |       |
| 5.  | Sufficient enforcement is needed to prohibit unauthorized ATV use.  | 1.51  | 0.87  | 1.76  |
| 31. | In areas where the forest transcends federal, state and county boundaries, a committee of officials from the respective governments should be formed to harmonize the confusing rules that state, federal, and county governments make. | 0.34  | 0.74  | 1.26  |
| 18. | If creating more ATV trails meant it would keep them off other public roadways, town roads, and county roads, I would be supportive.  | -1.14 | -0.23 | -0.30 |
| 41. | The Managed designation is the best for all parties involved because this way if the DNR feels the trails are too wet or have been used too much they can close them down.  | -1.17 | -0.49 | -0.12 |
| 36. | To find a good statewide solution to the ATV problem, we need to be bold enough to make the decisions without being politically swayed.   | 1.76  | 0.87  | 0.77  |
| 24. | The current maps of ATV trails are a good start but they will need to be improved to make them as accurate as possible.   | 0.04  | 0.74  | 1.12  |
| 49. | Without continued dialogue about the issues facing the ATV program, there is great concern about an environmentally acceptable ATV program existing in Minnesota.   | 0.70  | 0.48  | -0.34 |
| 40. | Restricting ATV use is no different than that of fishing "seasons", "bag limits" or non use of motors in some lakes.  | 0.66  | -0.44 | 0.27  |
| 54. | The most important goal should be sustainable resource management while being fair to all public forest users.  | 0.87  | 1.93  | 1.71  |
| 20. | Trails should be designated for either non-motorized use or any motorized vehicle with a width of so many inches, rather than having separate trails for each type of motorized vehicle.  | -0.43 | -0.68 | 0.42  |
| 2.  | Additional fees on all ATV users would be unfair to those who ride responsibly; instead, stringent fees and penalties should apply to renegade riders.  | -0.82 | 0.39  | -0.01 |
| 3.  | Thrill seeking ATV users should pay a thrill fee to support enforcement and trail repairs.  | -0.23 | -1.31 | -1.30 |
| 1.  | Fees should be charged to all ATV users for trail upkeep and enforcement.   | 0.99  | -0.26 | 0.19  |
| 48. | A balanced citizens committee that meets regularly to consider ATV issues would help instill respect for different opinions and reduce mistrust of others' motives.   | 0.03  | 0.25  | -1.05 |
| 21. | Make provisions to accommodate big game hunting using ATVs.   | -0.86 | 0.33  | -0.90 |
| 50. | Rut-causing tire types should be regulated to reduce the severity of ruts.  | 0.62  | -0.75 | -0.44 |
| 16. | Enough trails would help keep ATV use out of ditches, wetlands, and other sensitive areas.  | -1.64 | -0.51 | -0.25 |
| 43. | The ATV issue will self-correct in future years.  | -2.11 | -2.19 | -0.85 |
| 34. | A trail ambassador type program to assist in safety, environmental education, and monitoring trails on public lands would be one good way to limit ATV destruction of public lands.   | -0.73 | 0.65  | 0.56  |
| 47. | An ATV management process that recommends protection of   | 0.92  | -0.34 | -0.49 |

|     |  |       |       |       |
|-----|--|-------|-------|-------|
|     | natural resources is more likely to evade criticisms from environmental groups, lawsuits, delays and frustrations over the best way to get trails on the ground.                                       |       |       |       |
| 7.  | The forest is quieter than the cities so forest ATV use should have tougher noise regulation than elsewhere.   | 0.71  | -0.81 | -0.45 |
| 32. | A permanent, balanced citizen committee made up of people willing to set aside suspicion and mistrust, which reports regularly to the legislature and the DNR about ATV issues, will help.             | -0.19 | 0.25  | -1.30 |
| 13. | Low-maintenance roads connecting to sections of higher standard roads to create loops and destination points will help reduce ATV damage and off-trail violations.                                     | -0.98 | 0.62  | -0.06 |
| 28. | Develop ATV trails in the urban areas.   | -0.05 | -0.21 | 1.29  |
| 11. | The DNR should develop a system that spreads ridership throughout the state as a means to protect natural resources and meet appropriate recreational expectations.                                    | -0.90 | 1.03  | 0.59  |
| 6.  | ATV management should be stringent, with no gray areas.  | 0.77  | -0.78 | 1.16  |
| 27. | I would like a balance of uses for all peoples' enjoyment and in a respectful manner. The Minnesota forest is a beautiful area and should be enjoyed by all.   | 0.08  | 2.04  | 1.65  |
| 26. | When an ATV goes off-trail it creates a new trail and if that new trail is unmarked, other ATVs will follow, so it is better to post trails that are open for ATV use rather than those which are not. | 1.46  | 0.53  | -0.63 |
| 46. | The DNR should provide a system of environmentally sustainable trails that accommodates multiple skill levels and provides access to suitable riding opportunities.                                    | -0.46 | 1.57  | 1.16  |
| 53. | Only normal ATV riding should be allowed in state forests; thrill riders should be restricted to private property.   | 0.77  | -1.40 | -0.29 |
| 22. | Challenging riding areas should be located in all corners of the state, not just in north-central Minnesota, to disperse rather than concentrate severe impacts.                                       | -0.90 | 1.28  | 0.46  |
| 29. | Other forest users need to get the message that these forests are multi-use and that certain areas are going to have some noise and erosion from ATV use.  | -1.54 | 0.32  | 0.46  |
| 30. | Compromises can be found with enough ATV trails and solitude areas while protecting natural resources for future generations.  | -0.49 | 1.54  | 1.34  |
| 39. | In the spirit of free enterprise and entrepreneurship, we should limit ATV use to private lands; it will create jobs and confine ATVs to areas controlled by private interests.                        | 0.20  | -2.15 | -1.00 |
| 15. | Trails should include access to local businesses so that ATV riders can readily contribute to the local economy (gas, lodging, dining, etc.).  | -0.79 | 0.83  | 1.55  |
| 23. | I support multiple uses of trails by snowmobiles and ATVs; in the summer ATV use trails to help keep brush down and in winter snowmobiles use them.  | -1.22 | 0.47  | 1.28  |
| 33. | A thorough environmental assessment of all state forest trails is essential to get those opposed to ATVs to be comfortable with trails development.  | 0.79  | 0.42  | -1.64 |
| 19. | Recreational use of abandoned logging roads should be allowed; it will reduce ATV traffic and impacts as legal trails are  | -1.57 | 0.82  | -1.32 |

|     |  |      |       |       |
|-----|--|------|-------|-------|
|     | becoming fewer and fewer.  |      |       |       |
| 12. | We need to set aside large ATV-free areas, as has been done in some federal parks and forests.                               | 1.78 | 0.22  | -0.99 |
| 38. | If ATV use is further encouraged in forests, other types of recreation and the revenue generated from them could suffer.     | 1.00 | -1.46 | -1.45 |
| 10. | It is wisest to allow ATV traffic only in areas that professional foresters and ecologists designate as suitable.            | 1.86 | -1.06 | 0.86  |
| 51. | The notion of ‘multiple uses’, or sharing public lands, is not a reasonable way to manage ATV riders and other forest users. | 0.95 | -2.02 | -1.58 |
| 17. | Opening more areas to ATV traffic will only increase violations and cause more environmental destruction.                    | 1.48 | -1.43 | -1.91 |

## Comparing Problem and Management Frames

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Several insights can be gained from comparing the problem and management frames. Most notably, there is a strong association between problem frame one and management frame A; about 78 percent (31 of 40) of those who significantly agree with problem perspective 1 also significantly agree with management perspective A. Similarly, 51.3 percent (20 of 39) of those who significantly agree with problem perspective 2 also significantly agree with management perspective A, while 6.8 percent (3 of 44) of those who significantly agree with problem perspective 3 also significantly agree with management perspective A. There were also somewhat strong associations between problem perspectives 3 and management frames B and C. About forty-six (45.5%) percent (20 of 44) of those who significantly agree with problem perspective 3 also significantly agree with management frame B, while 36.4 percent (16 of 44) of those who significantly agree with problem perspective 3 also significantly agree with management perspective C.

The relatively low levels of significant disagreements across problem and management frames were also insightful. The largest association of significant disagreements was among those who significantly disagree with problem perspective 1. Twenty percent (2 of 10) of those who significantly agree with problem perspective 1 also significantly disagree with management perspective A, while 11.4 percent (5 of 44) of those who significantly agree with perspective 3 of the problem frame significantly disagree with management perspective A. Only one of 40 individuals who significantly agree with perspective 1 of the problem frame significantly disagrees with perspective B of the management frame, the only individual of all participants who significantly disagree with this management frame.

## Discussion and Conclusions

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There is a higher negative inter-perspective association among problem frame perspectives (Table 7) than among management frame perspectives (Table 14 i.e., there are stronger disagreements (between perspectives 1 and 2) about what the problem is with ATV use in state-administered lands than there is about any pair of perspectives about how we should manage ATVs in state-administered lands). Stakeholders found some level of consensus on only 9 of the

60 statements about what the problem is with ATV use in MN state forest lands. On the management front, however, stakeholders found some level of consensus on 19 of the 55 statements about how we should or should not manage ATV use in MN state forests. Additionally, only seven individuals significantly disagreed with one management frame perspective or the other, while 14 individuals significantly disagree with one problem frame or the other.

These results suggest that stakeholders disagree less about how to manage ATVs than they do about what the problem is with ATV use in MN state forest lands. This phenomenon is somewhat comparable to Maier's (1967) idea of "solution mindedness," i.e.,

*"... an anxiety to reach a solution to the problem as given..., which tends to inhibit the exploration of novel avenues of attack on the problem and the generation of new and inventive ideas about the problem."*

Solution mindedness is said to be one of the major reasons why environmental conflicts are so hard to resolve (Bardwell, 1991). However, results suggest that the conflict intensifies with the shift from deliberating management options to problem identification.

After spending over fifty hours with various stakeholders, it was obvious that the ATV conflict is not just about facts, social values, and politics but also about myths. One of the strengths of Q methodology is that it enables stakeholders to check their understanding of an issue with those of other stakeholders. During the course of the study, we were able to identify and verify some myths about the ATV conflict pertaining to those who participated in the study.

**Myth #1: *Non-motorized forest recreationists and environmentalists do not accept a place for ATVs in MN state forest lands.***

**Reality:** All perspectives in the problem frame disagree with the statement that "There is no place for motorized recreation in MN public forests." This is particularly important because it suggests that the question is not whether we should have ATVs in state forest lands but under what conditions.

**Myth #2: *Environmentalists are the champions of an anti-ATV movement.***

**Reality:** Although all four individuals who identified themselves as environmental advocates loaded negatively on perspective 3 of the problem frame, none of those loadings were statistically significant. The same is true for the two environmental advocates who load negatively on perspectives B and C of the management frame. That is, although these individuals disagree with some perspectives, their disagreements are relatively insignificant. On the contrary, those at the extreme opposing ends of the conflict continuum appear (based on their significantly negative loading scores on the problem and management frame perspectives) to be members of ATV clubs, high recreational use ATV riders, and members of the DNR parks and trails, trails section, on one hand, and private land owners on the other. On one hand, members of ATV clubs,

high recreational use ATV riders, and members of the DNR parks and trails, trails section, disagree significantly with perspectives 1 and perspective A of the problem and management frames, respectively. On the other hand, the private land owners disagree significantly with perspective 3 of the problem frame but do not significantly disagree with any management frame perspective. The major issues of contention between these two extremes are related to the sufficiency of places for solitude like experiences and the role that the DNR plays in managing ATVs, including claims and counter claims that such role is tainted with political and economic influences.

Perspective 3 of the problem frames, where 14 of the 20 defining sorts are either ATV club members or high recreational ATV users, strongly disagree with the statements that “I don’t think that the level of non-motorized use justifies the current acreage reserved for it.” (See statement no. 8, Table 6). This disagreement somewhat disputes the myth that: *ATV riders think that there is too much land available for non-motorized recreation.*

Besides the mythology of the ATV conflict, several lessons for management are obvious. All perspectives disagree with claims that:

- i. “We don’t need trail signs everywhere because area boundaries are typically well-defined and easily recognizable to ATV users” (problem frame statement no. 23, and a similar management frame statement no. 25); and
- ii. “The current permitted uses in state/federal forests roads and trails are clear and easy to know what is allowed where” (problem frame statement no. 26).

Efforts to improve signage and clarify permitted uses will be welcomed by all sides of the ATV issue.

Similarly, all stakeholders agree with the management frame statements that:

- i. On-the-ground conditions, rather than some pre-determined dates, should determine opening and closing dates for ATV activity (statement no. 42, Table 16);
- ii. Sufficient enforcement is required (statement no. 5);
- iii. ATV rules are confusing in areas where trails transcend federal, state, and county boundaries (statement no. 31);
- iv. Avoidance of political influences on ATV planning and management efforts (statement no. 36);
- v. The accuracy of ATV trail maps should be improved (statement no. 24);
- vi. Sustainable resource management, while being fair to all forest users, should be the most important goal (statement no. 54); and
- vii. A balance of uses for the enjoyment of all is desirable (statement no. 27, Table 16).

It is insightful to see that all three problem frame perspectives agree, without significant differences, on the problem frame statement that “*The lack of agreement on recommendations calling for protection of natural resources in the ATV management process stands in the way of a better ATV system in MN for the future*” (statement no. 18, Tables 8 and 9).

The fact that there were so many multiple positive loaders speaks to the notion that participant perspectives about ATV problems and management options are not “carved in stone.” Additionally, most of these multiple loaders are from the DNR, evidence of the existence of considerable flexibility among DNR ATV-related staff in perceiving the ATV controversy and the important role that this flexibility might be playing in buffering the intensity of the conflict.

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# APPENDIX A: Study Materials

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## (i) Consent Form

### From Debate to Dialogue on ATV Use in Minnesota Public Forests: Frames from Stakeholder Insights

You are invited to be in a research study about All Terrain Vehicle (ATV) use in MN public forests. You are selected because we find your perspective of interest to our understanding and management of ATVs in Minnesota public forests. We ask that you read this form and ask any questions you may have before participating in the study.

This study is being conducted by: Stanley Asah and Kristen Nelson of the Department of Forest Resources, University of Minnesota, and David Bengston of the US Forest Service in St. Paul, and Leif DeVaney, graduate student at the University of Minnesota.

#### **Background Information**

The purpose of this study is to understand how Minnesota public forest stakeholders frame ATV problems and management options.

#### **Procedures:**

If you agree to be in this study, we would ask you to do the following things: You will be provided with three decks of cards containing statements about ATVs. These statements were selected from comments solicited through ATV open house meetings, and from newspaper articles and blogs about ATVs, and interviews with various public forest users, planners, and managers. For each deck, you'll be asked to carefully read all the statements to fully understand the range of ideas contained in the deck of cards. After reading each set of cards, you'll be asked to begin sorting the statements in three piles (those that you agree with, disagree with, or are neutral about).

Upon completion of the three piles, you'll be asked to make finer distinctions and rankings of the statements from each deck by placing card numbers into a chart that you'll be provided. After placing the card numbers in the slots on the chart provided, you'll be asked to briefly discuss the sorting activity. You may also be contacted for clarification of your sorting sometime after the study is completed. The entire study (ranking of 3 decks of cards) might take anywhere between 20 minutes to 1 hour.

#### **Risks and Benefits of being in the Study**

The benefits to participation are that it will help planners and managers improve ATV management in Minnesota public lands.

#### **Compensation:**

In appreciation of your time participating in the study, you will receive a cash compensation of up to \$50.00 as soon as you completely rank the sets of cards. This benefit will be prorated due to early withdrawal. We expect you to acknowledge receipt of the cash compensation by signing a sheet of paper provided. Your signature is only needed for accounting purposes and will not be associated with your responses.

#### **Confidentiality:**

The records of this study will be kept private. In any report we might publish, we will not include any information that will make it possible to identify you. Research records will be stored securely and only researchers will have access to the records.

**Voluntary Nature of the Study:**

Participation in this study is voluntary. Your decision about whether or not to participate will not affect your current or future relations with the University of Minnesota, MN DNR, or US Forest Service. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

**Contacts and Questions:**

The researchers conducting this study are: Stanley Asah, David Bengston, Kristen Nelson, and Leif DeVaney. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact them at all or any of the following:

Stanley Asah at 651-259-5562; [asah0002@umn.edu](mailto:asah0002@umn.edu)  
David Bengston at 651-649-5162; [dbengston@fs.fed.us](mailto:dbengston@fs.fed.us)

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher(s), **you are encouraged** to contact the Research Subjects’ Advocate Line, D528 Mayo, 420 Delaware St. Southeast, Minneapolis, Minnesota 55455; (612) 625-1650.

*You will be given a copy of this information to keep for your records.*

**Statement of Consent:**

I have read the above information. I have asked questions and have received answers. I consent to participate in the study.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Signature of Investigator: \_\_\_\_\_ Date: \_\_\_\_\_

Signature of Investigator: \_\_\_\_\_ Date: \_\_\_\_\_

## (ii) Preliminary Survey

Before proceeding with the study we will like you to answer the following short questions.

1. Many people are concerned about environmental problems because of the consequences that may result. However, people differ in the consequences that concern them the most. Please rate the following items from 1 (not important) to 7 (important) in response to the question: I am concerned about environmental problems because of the consequences for \_\_\_\_.

Plants                       Me                       People in my community  
 Marine life                       My lifestyle                       All People  
 Birds                       My health                       Children  
 Animals                       My future                       Future Generations

|  | Never | Rarely | Sometimes | Often | Very Often | Don't know |
|--|-------|--------|-----------|-------|------------|------------|
| I ride ATVs on private lands and private trails  | 0     | 1      | 2         | 3     | 4          | 5          |
| I ride ATVs on public roads and right-of-ways including roadside ditches               | 0     | 1      | 2         | 3     | 4          | 5          |
| I ride ATVs on public lands and public trails (this excludes public road right-of-way) | 0     | 1      | 2         | 3     | 4          | 5          |
| I ride my ATV for fun  | 0     | 1      | 2         | 3     | 4          | 5          |
| I ride my ATV for practical purposes (like transportation, hunting, etc)               | 0     | 1      | 2         | 3     | 4          | 5          |
| I see people riding ATVs   | 0     | 1      | 2         | 3     | 4          | 5          |
| I spend time in Minnesota state forests  | 0     | 1      | 2         | 3     | 4          | 5          |
| I read about ATVs  | 0     | 1      | 2         | 3     | 4          | 5          |
| I hear/talk about ATVs   | 0     | 1      | 2         | 3     | 4          | 5          |

2. Do you own an ATV? (\_\_\_) Yes or (\_\_\_) No  
 3. In what year were you born? \_\_\_\_\_  
 4. Are you: (\_\_\_) Female or ( \_\_\_)Male  
 5. Highest level of education you have completed? (check one)  
 Some high school                       Graduated High school or GED  
 Some vocational or technical school                       Graduated voc or technical school  
 Some College                       Graduated College  
 Some graduate school                       Graduated graduate school

What is your occupation? \_\_\_\_\_

If you work for the DNR, please specify division: \_\_\_\_\_

### (iii) Instructions for Sort #01:

#### (Similar Instructions were provided for the other sorts)

These instructions will guide you through the survey step by step. Please read each step to the end before you start carrying it out.

1. Take the deck of cards, a pencil with an eraser, and the score sheets and sit at a table. Lay down the score sheet in front of you. Each card contains a statement about ATVs. These statements were selected from comments solicited through ATV open houses, newspaper articles and blogs about ATVs, and interviews with public forest users, planners, and managers. Our request to you is to answer the following question: "To what extent do you agree with the following statements?" There are no wrong or right answers. We would like you to rank-order these statements from your own point of view. The numbers on the cards (from 1 to 60) have been assigned to the cards randomly and are only relevant for recording your response.
2. Read all 60 statements carefully and split them up into three piles: a pile for statements you tend to **disagree** with, a pile for those you tend to **agree** with, and a pile for those you **neither agree nor disagree with, or that are not relevant or applicable to you**. When you have finished laying down the cards in three piles, count the number of cards in each pile and write down this number in the corresponding box on the score sheet: Box #1: number of cards in the agree pile; Box #2: number of cards the neutral or not applicable pile, and Box #3: number of cards in the disagree pile. Again, we are interested in your point of view, so there is no right or wrong answer. Please check whether the numbers in the three boxes add up to 60.
3. Take the cards from the AGREE pile and read them again. Select three statements you most agree with and write the card numbers in the 3 boxes on column K of the score sheet; it does not matter which number goes on top or below. Next, from the remaining cards in the agree pile, select 5 statements you most agree with and write the card numbers in the 5 boxes in column J of the score sheet. Next, from the remaining cards in the agree pile, select another set of 5 statements that you most agree with and write the card numbers on the 5 boxes in column I. Follow this procedure for all cards in the agree pile.
4. Now take the cards from the DISAGREE pile and read them again. Select 3 statements you most disagree with and write their numbers in the 3 boxes on column A of the score sheet. Next, from the remaining cards in the disagree pile, select 5 statements that you most disagree with and write their numbers in the 5 boxes on column B. Follow this procedure for all cards in the DISAGREE pile.
5. Finally, take the remaining cards (neutral or not applicable pile) and read them again. Arrange the cards in the remaining open boxes of the score sheet as they fit your agreement or disagreement. It is ok to put statements in columns F that you slightly agree or disagree with.
6. When you have written the numbers of all cards on the score sheet, please go over your distribution once again and erase and re-write card numbers if you want to make changes. Please make sure that all boxes are filled and that no card number is in more than one box.

**(iv) Figure A-1. Score Grid for Problem Frames: Deck of 60 Cards (statements)**

Strongly Disagree ← Neutral → Strongly Agree

| -5<br>Column A           | -4<br>Column B           | -3<br>Column C           | -2<br>Column D           | -1<br>Column E           | 0<br>Column F            | +1<br>Column G           | +2<br>Column H           | +3<br>Column I           | +4<br>Column J           | +5<br>Column K           |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
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|                          |                          |                          |                          |                          |                          |                          |                          | <input type="checkbox"/> | <input type="checkbox"/> |                          |
|                          |                          |                          |                          |                          |                          |                          |                          |                          | <input type="checkbox"/> |                          |
|                          |                          |                          |                          |                          |                          |                          |                          |                          |                          | <input type="checkbox"/> |

**DISAGREE BOX**

Count \_\_\_\_\_

**NEUTRAL OR NOT RELEVANT BOX**

Count \_\_\_\_\_

**AGREE BOX**

Count \_\_\_\_\_

**(v) Additional Responses to Sort 1  
(Similar questions were asked for sort #2)**

1. Please explain why you agree most with the 3 statements you have placed in column K.

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2. Please explain why you disagree most with the 3 statements you have placed in column A.

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3. Any other comments about ATVs and about this exercise?

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4. Are you, or have you ever been, involved with ATVs in any way? If yes, please describe.

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**(vi) Figure A-2. Score Grid for Sort #2: Deck of 55 Cards about Management Options**

|  | -4<br>Column A  | -3<br>Column B  | -2<br>Column C  | -1<br>Column D  | 0<br>Column E   | +1<br>Column F  | +2<br>Column G  | +3<br>Column H  | +4<br>Column I  |
|--|---|---|---|---|---|---|---|---|---|
|  | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> |
|  | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> |
|  | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> |
|  |   | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> |   |
|  |   | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> |   |
|  |   |   | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> |   |   |
|  |   |   | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> |   |   |
|  |   |   |   | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> |   |   |
|  |   |   |   |   | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> |   |   |
|  |   |   |   |   |   | <input style="width: 40px; height: 20px;" type="text"/> | <input style="width: 40px; height: 20px;" type="text"/> |   |   |
|  |   |   |   |   |   |   | <input style="width: 40px; height: 20px;" type="text"/> |   |   |
|  |   |   |   |   |   |   |   | <input style="width: 40px; height: 20px;" type="text"/> |   |
|  |   |   |   |   |   |   |   |   | <input style="width: 40px; height: 20px;" type="text"/> |

DISAGREE BOX

Count \_\_\_\_\_

NEUTRAL OR NOT  
RELEVANT BOX

Count \_\_\_\_\_

AGREE BOX

Count \_\_\_\_\_