

Central Minnesota Private Landowner Attitudes Toward Off-Highway Vehicle Access

by

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EXECUTIVE SUMMARY

In 2007, the Central Minnesota Sustainable Development Partnership contracted the Department of Forest Resources at the University of Minnesota to study private landowner perceptions of off-highway vehicle (OHV) use. This study characterizes how private forests and seasonal recreation lands in an eight-county region are used and the willingness of landowners to allow OHV access. The following results provide officials in the Minnesota counties of Becker, Cass, Crow Wing, Hubbard, Morrison, Otter Tail, Todd and Wadena with information about how best to manage for the increasing demand for places to ride OHVs and identifies the scope of conflict and use on private lands.

A survey questionnaire was administered to private landowners in the fall of 2007 to assess their attitudes toward OHV riding, perceptions of the benefits and negative impacts of OHVs informing their access, and land management actions taken in response to OHV impacts. To inform design of the survey, and because little information exists regarding private landowner attitudes and perceptions of OHV access, four focus groups were conducted in the region in the spring of 2007. Results were used to develop the survey instrument reported on in this study.

For the purposes of our study, private lands classified for tax purposes as seasonal recreation or timberlands were used to identify the sample population. Seasonal recreation landowners were selected because their lake cabins or other recreational lands are common in the region, and because their land is owned for the primary purpose of recreation. Timberland owners were selected because they generally possess larger parcels bordering tracts of public land, are frequently accessed by OHVs via state and county highways, and represent areas having key physical attributes desired by OHV riders. These landowners may also be affected by state-designated OHV trails and the nearly 37,000 registered users in the region (MN DNR 2005).

A total of 4,271 timberland and 47,812 seasonal recreation landowners were identified from 2006 county tax records in the study region, representing almost 6.9 million acres. The sample population for the survey questionnaire was stratified by timberland (775 surveys sent) and seasonal recreation landowners (825 surveys sent) achieving a response rate of 60% and 51% respectively, with a sampling error of 5%. The average size of timberland parcels was approximately 95 acres with an average of two parcels owned per landowner (excluding large corporate timberlands). A majority of seasonal recreation properties were less than one acre in size, but the average size of all seasonal properties was 8.2 acres and an average of 1.4 parcels owned per landowner.

Based on the key issues to emerge from the focus groups, the survey questionnaire was organized by: (1) types of land uses, (2) benefits derived from OHVs, (3) negative impacts from OHV use, and (4) management actions taken in response. Our analysis focused on how these factors influence landowner willingness to allow OHV access for family and friends, and for the general public. The key themes that emerged included:

Types of Land Use

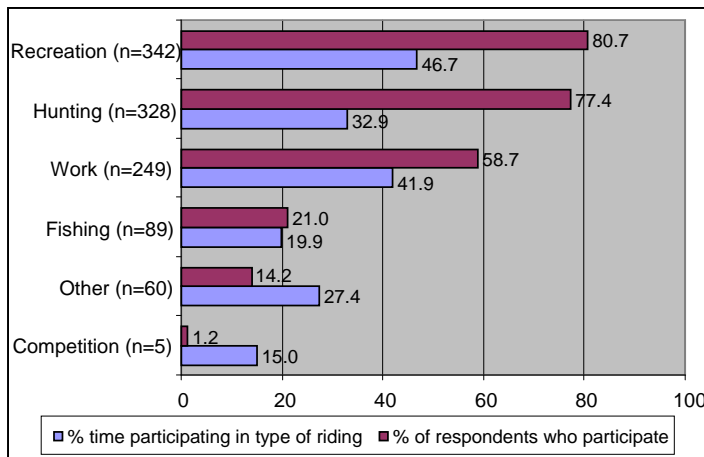
- Timberland owners use their property most for hunting followed by solitude and escape, whereas seasonal recreation landowners use their property most for solitude and escape followed by fishing. ATV and snowmobile use was similar for both landowner types.

Only a small fraction of timberland owners indicated they actively use their property for the production of forest products.

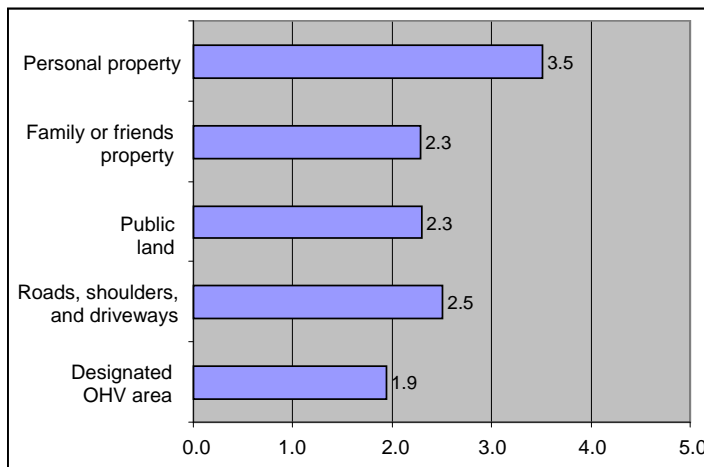
- OHV riders tended to use their property most for hunting followed by solitude and escape, and nonriders use their property most for solitude and escape but also fishing. Predictably, OHV riders used their property more than nonriders for related motor-sport activities. Hunting was seldom done on seasonal recreation lands.

Benefits Derived from OHVs

- When asked about the percentage of time participating in different types of OHV riding, recreational riding was the most frequent type, followed by riding for hunting and work-related activities, which is consistent with past studies.
- When assessed by type of landowner, timberland owners were found to spend most of their time using OHVs for work-related activities (45%). But when compared by the total number of users, the greatest number engaged in riding for hunting (52%) and general recreation (50%).



Percent of time using OHVs for various activities among landowners who ride.



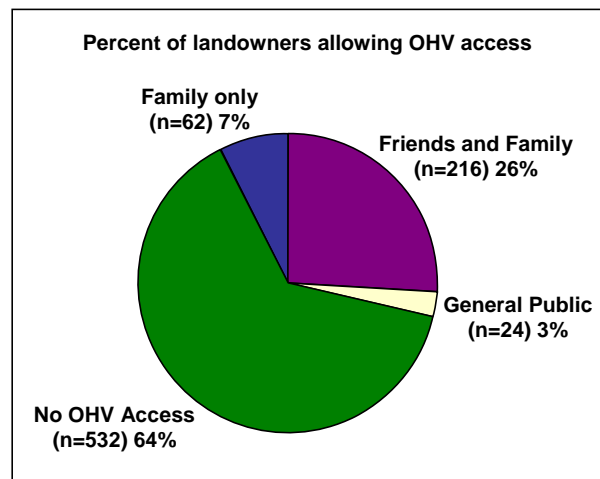
Frequency of OHV use (scale: 1=never, 2=rarely, 3=sometimes, 4=often, 5=very often).

Negative Impacts from OHVs

- The challenge faced by many landowners in the eight-county study region, regardless of type or whether they allow riding on their property, is in managing for the negative impacts caused by OHVs. County and state land managers are challenged in providing adequate places to ride OHVs safely, free from interfering nonmotorized activities and from causing excessive environmental damage.
- Landowners were most concerned about damage caused to soils, wetlands, and vegetation. They were also concerned about interference to wildlife and hunting, particularly among OHV riders and timberland owners.
- Factors such as vandalism, the spread of invasive weeds, roadside damage and interference with other motorized and nonmotorized recreation were also key concerns but were not consistent among landowner types.
- A majority of respondents have not personally experienced negative impacts on their property. It was revealed that most impacts are either not observed at all, are experienced by neighbors, or are more common on public lands. This suggests that perceptions of impacts and riding behaviors, rather than experiences, are driving landowners' attitudes towards OHV riders and concerns for their property.
- Of those impacts most commonly experienced, littering, wildlife and hunting disturbance, damage to driveways, and to soils and vegetation were the most prevalent. Spread of invasive plants, threats to personal safety, interference with personal OHV riding, and damage to crops were among the least reported.

Willingness to Allow Access

- 64% of landowners currently prohibit OHV access. Of those who do allow access, 72% permit family and friends (26% of all landowners) to ride on their property, but only 8% of the general public (3% of all landowners).
- Timberland owners were more willing to allow OHV access than seasonal recreation landowners, particularly when speeds are below 10 mph, group size is less than four people, riders are older than 16 years of age, access is fewer than five times per year, and noises are low.
- Of concern among all landowners was the young age of riders, high speeds, loud noises, riding on steep slopes, and through water-crossings or wetlands. This was confirmed in the factor analysis that willingness to allow access significantly increased when these situations were avoided, for both family and friends and to the general public.
- Seeking permission to ride on private property factored highly in determining willingness to allow access to the general public, as did riding along roadsides and away from buildings. Adherence to these constraints increased willingness to 12% for timberland and seasonal recreation landowners, 17% among landowners who ride OHVs, and 6% of non-OHV riding landowners. This indicates that the behaviors and characteristics of OHV riders have an important influence on landowners' attitudes toward access.



Landowner Management Actions

- Of landowners surveyed, 27% indicate that OHVs are accessing their property without permission, most of which are thought to be coming from neighboring private lands as opposed to public lands or designated trails.
- Timberland owners reported a higher percentage of unauthorized access than seasonal recreation landowners.
- The most frequent actions taken in response to unauthorized access were to post signs or erected physical barriers. These were also perceived to be the most effective techniques. Actions to encourage responsible behavior like selling or leasing a portion of one's property, charging fees, having riders sign liability waivers, and providing trash bins were the least used and were also considered to be among the least effective.
- Among landowners having taken action, the average number of days over the previous three years for planning, maintenance and related repairs was 4.5 days. The average amount of money spent over the same period was less than \$100. This low expenditure of resources is also consistent with the low number of respondents who report experiencing impacts on their property.

Private landowners fit prominently into OHV management considerations in Minnesota with private lands comprising more than 75% of all land in the state (MN DNR 2008). Any trail system of reasonable size will likely border private lands and may seek to utilize them as key connectors between adjacent public lands. The results of this study identifies both the types of situations where landowners might be willing to grant access, and also the types of concerns landowners have regarding the use of their property, location of impacts, and types of impacts caused. These findings are critical to the designation of state and local trails and for officials in the eight-county region who are responsible for road maintenance and repair, enforcement, and general natural resource management.

Percent of landowners willing to allow OHV access by type, 2007.¹

	----- FRIENDS and FAMILY -----				----- GENERAL PUBLIC -----			
	Seasonal rec	Timberland	OHV rider	Nonrider	Seasonal rec	Timberland	OHV rider	Nonrider
Speed of Riders								
Less than 10 mph	41.0 (154)	56.8 (242)	75.1 (292)	25.1 (98)	9.2 (35)	8.7 (38)	13.6 (55)	4.3 (17)
10-20 mph	26.8 (99)	39.0 (161)	53.2 (201)	13.9 (53)	7.1 (27)	6.5 (28)	10.3 (41)	3.3 (13)
More than 20 mph	11.9 (43)	19.1 (77)	25.5 (95)	7.0 (26)	2.9 (11)	3.3 (14)	4.5 (18)	1.8 (7)
Number of Riders								
One rider	39.2 (142)	55.7 (225)	73.4 (268)	24.1 (91)	8.3 (31)	9.0 (39)	13.0 (51)	4.6 (18)
Two or three riders	30.0 (109)	44.7 (186)	61.7 (237)	14.7 (55)	8.7 (33)	8.5 (37)	13.6 (55)	3.6 (14)
Four or more riders	15.2 (54)	24.5 (99)	34.6 (128)	6.8 (25)	7.1 (27)	5.1 (22)	9.3 (37)	3.1 (12)
Age of Riders								
Less than 12 years of age	9.1 (33)	14.4 (58)	18.6 (68)	6.1 (23)	3.2 (12)	3.4 (15)	4.8 (19)	1.8 (7)
12-15 years of age	21.6 (79)	28.6 (115)	40.9 (152)	10.5 (39)	5.3 (20)	5.3 (23)	7.8 (31)	3.1 (12)
16-25 years of age	36.1 (133)	49.9 (209)	68.5 (265)	18.3 (69)	9.2 (35)	6.9 (30)	11.7 (47)	4.6 (18)
Older than 25 years of age	40.5 (145)	58.4 (240)	77.5 (292)	22.5 (83)	10.1 (38)	9.1 (40)	14.7 (60)	4.4 (17)
Frequency of Riding								
Less than five times per year	37.5 (133)	55.0 (224)	72.0 (265)	22.9 (85)	8.2 (31)	8.3 (36)	12.5 (50)	4.1 (16)
Five to ten times per year	26.3 (93)	39.1 (158)	51.4 (190)	15.7 (57)	6.7 (25)	6.2 (27)	10.2 (40)	2.8 (11)
More than ten times per year	21.4 (76)	28.2 (114)	42.1 (157)	8.5 (31)	6.1 (23)	4.8 (21)	8.5 (34)	2.6 (10)
Location of Riding								
Woodlands	34.1 (122)	48.7 (210)	65.3 (260)	18.5 (68)	10.6 (40)	8.2 (36)	14.3 (58)	4.6 (18)
Prairies	21.7 (72)	31.2 (119)	44.2 (151)	11.2 (39)	8.4 (31)	3.8 (16)	8.0 (31)	3.6 (14)
Water crossings or wetlands	12.2 (41)	14.2 (56)	20.4 (73)	6.9 (24)	5.1 (19)	2.8 (12)	5.6 (22)	2.1 (8)
On steep inclines	8.6 (29)	13.0 (51)	17.4 (62)	5.1 (18)	3.5 (13)	2.6 (11)	4.3 (17)	1.6 (6)
On driveways or along roads	37.2 (132)	45.9 (186)	62.8 (236)	20.9 (76)	9.1 (34)	8.3 (36)	14.3 (57)	3.1 (12)
½-mile or less from buildings	27.2 (90)	35.2 (132)	45.8 (162)	13.9 (50)	7.6 (28)	5.6 (24)	10.8 (42)	2.6 (10)
Size of Riding Area								
Less than ½ square mile used	29.2 (100)	43.1 (170)	56.8 (201)	18.0 (65)	7.0 (26)	6.9 (30)	10.3 (40)	3.8 (15)
½ - 1 square mile used	19.4 (63)	28.9 (107)	42.5 (142)	8.2 (28)	6.9 (25)	5.4 (23)	9.0 (35)	3.4 (13)
More than 1 square mile used	19.1 (62)	27.1 (100)	38.2 (126)	10.2 (35)	7.2 (26)	5.2 (22)	8.6 (33)	3.9 (15)
Time of Year Riding:								
Winter	37.6 (132)	44.3 (183)	61.0 (228)	21.6 (79)	11.4 (43)	9.1 (40)	14.3 (57)	6.1 (24)
Spring	26.1 (92)	36.3 (149)	51.1 (193)	12.7 (46)	8.6 (32)	7.4 (32)	12.0 (48)	4.2 (16)
Summer	36.6 (133)	48.1 (201)	67.1 (261)	19.2 (71)	10.8 (41)	8.7 (38)	15.1 (61)	4.9 (19)
Fall	35.2 (124)	51.3 (217)	67.1 (261)	20.3 (74)	10.9 (41)	8.5 (37)	14.6 (59)	4.9 (19)
During hunting season	26.3 (93)	37.2 (156)	47.5 (184)	16.6 (60)	8.6 (32)	5.7 (25)	9.5 (38)	4.4 (17)
Noise level created by riders								
Low	40.7 (145)	56.1 (240)	73.1 (285)	25.1 (93)	12.2 (46)	9.9 (43)	15.9 (64)	6.2 (24)
Moderate	19.5 (67)	27.6 (109)	37.7 (136)	11.5 (41)	6.3 (23)	5.2 (22)	8.4 (33)	3.4 (13)
High	4.8 (16)	9.5 (37)	11.8 (41)	3.4 (12)	2.2 (8)	2.3 (10)	3.1 (12)	1.6 (6)
Riders sign Liability waiver	20.9 (339)	28.4 (394)	34.7 (125)	15.5 (55)	6.3 (23)	7.9 (34)	10.4 (41)	4.0 (15)
Riders ask for permission	34.3 (362)	44.5 (425)	57.6 (227)	22.6 (84)	10.8 (41)	12.4 (54)	17.0 (69)	6.4 (25)

¹ Number of respondents in parentheses.

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INTRODUCTION

In 2007, the Central Minnesota Sustainable Development Partnership contracted the Department of Forest Resources at the University of Minnesota to study private landowner perceptions of off-highway vehicle (OHV) use. The study characterizes how private forests and seasonal recreation lands in an eight-county region are used for recreation, willingness to allow OHV access, the benefits and negative impacts of OHV use, and management implications. It provides state and county officials with information about how best to management for the increasing demand for places to ride OHVs and identifies the scope of conflict and use on private lands.

The popularity of OHVs has grown substantially in recent years. Registrations of all-terrain vehicles and off-highway motorcycles surged from an 2.92 million across the United States in 1993 to an estimated 8.01 million in 2003 (Cordell et al. 2005). In Minnesota, OHV registrations went from 57,035 in 1994 to 240,254 in 2004, a 321% increase (Kelly 2005) and is projected to increase by an additional 251% by 2014. Nationally, OHV participation is projected to increase 42% during the same time (Cordell et al. 2005). Subsequent demand for places to ride will also increase (Nelson et al. 2000; English et al. 2004; Lord et al. 2004).

Some of that demand will be met with designated public trails on state and federal forests and on county lands (MN DNR 2005), but there is a growing awareness that riders may prefer private lands both for the proximity to places of residence as well as to connect them to trail systems (Schoenecker 2006). As more riders seek private land for OHV use, conflicts with landowners will likely increase but so will opportunities to benefit (Schneider and Schoenecker 2006).

The purpose of this study is to assess private landowner attitudes and management objectives associated with the use of OHVs on private lands and to characterize strategies for managing demand in the central Minnesota counties of Becker, Cass, Crow Wing, Hubbard, Morrison, Otter Tail, Todd, and Wadena (Figure 1.1). In particular, this study provides an assessment of private forest and seasonal recreation landowner perceptions based on the: (1) benefits of OHV riding; (2) negative impacts and concerns of OHV riding; (3) willingness to allow access; and (4) land management actions taken in response to OHVs. Results from focus groups with landowners and county representatives are presented, leading to the development of a survey questionnaire administered to a sample of landowners in the eight-county region. The report is divided into four sections: recreation access on private lands, data collection methods, findings, and management implications.

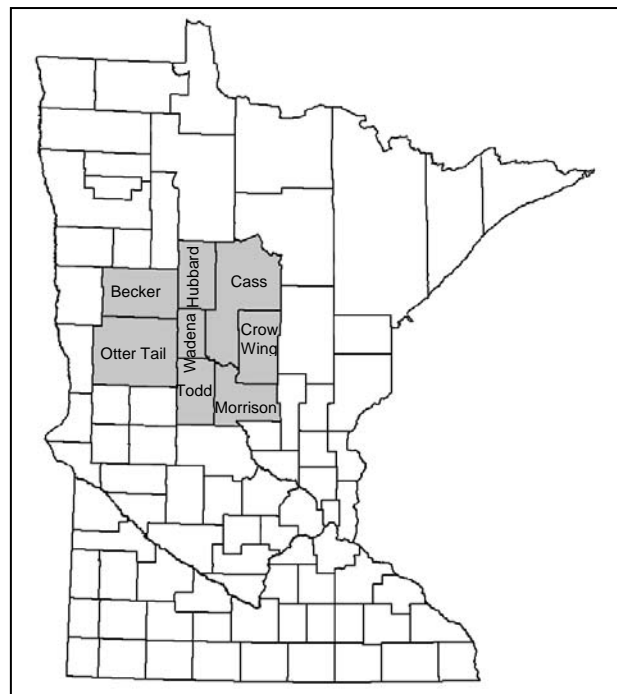


Figure 1. Counties in the Central Minnesota Sustainable Development Partnership.

RECREATION ACCESS ON PRIVATE LANDS

Private land access is increasingly important to supplement public lands for recreation. This presents challenges and opportunities for landowners. The challenges range from illegal access and damage to property to noise nuisances and maintenance of trails. Recreation users may be unfamiliar with local land ownership patterns. They may also seek out private lands for unique physical properties or because of expanded opportunities to participate.

Regardless of user motivations, the burden of responsibility to manage the resource and to mitigate for unintended or undesirable impacts often falls to the landowner, which may influence their willingness to grant access to the public or to family and friends. Landowner beliefs about recreationalists, liability concerns, attitudes regarding appropriateness of a specific recreation form, attributes and vulnerability of the resource base, and opportunities for income or other compensation all influence access decisions (Wright et al. 1990). In a nationwide study of access policies in the 1980s, 47% of Minnesota landowners were found to restrict access to friends, family, and close associates. Another 25% reserved exclusive rights for themselves, while 24% granted open access to the public. Among those with open access policies, consumptive uses like hunting, camping, and OHV riding were prohibited by more than 65% of landowners, while nonconsumptive activities like photography, bird watching, and hiking were allowed by a majority of respondents (Wright et al. 1990).

Benefits of Recreation Access

The benefits of OHV trails and riding on or near private lands are important to consider when assessing landowner attitudes. Beliefs about the appropriateness of OHV riding is influenced by perceptions about the social benefits of riding, such as providing recreation opportunities for physically handicapped, or for transportation purposes. Landowners also may not personally engage in recreational riding but use OHVs for accomplishing work-related tasks or to access remote locations for hunting or fishing (English et al. 2004; USDA Forest Service 2005). These types of personal experiences influence landowners' willingness to allow others to ride on their property.

Even where landowners do not use or own OHVs, the benefits gained through lease of land or fee-based permits can positively influence perceptions. In a study of public access for hunting, government-managed programs like the Walk-in Hunter Access program in which private lands are leased, are increasingly used for opening up private lands to recreation (Kilgore et al. 2008). The landowner receives payment, usually from the state, to allow open access and the managing entity in turn manages access while providing legal immunity to the landowner. The same opportunities exist for OHV access to private property.

Concerns with Private Land Access

Before access is granted, a number of concerns about private land access must be addressed. Specifically, landowners are increasingly concerned about the physical impacts of OHV riding including concern for soil erosion, wetland damage, vegetation loss, sedimentation, and wildlife dislocation (Preisler et al. 2006; Groom et al. 2007; Tull and Brussard 2007). Riding off-trail, through wetlands or mud holes, through areas of loose soil, and jumping ditches are examples of

riding behavior that contribute to these impacts. Repairing damage can be time-consuming and cost-intensive for landowners. Where a result of trespassing or vandalism, landowners are increasingly resistant to allowing OHV access (Teasley et al. 1997).

Unacceptable behavior has also been found to be a significant disincentive for landowners to allow recreation access (Round 1973; Brown 1974; Holecek and Westfall 1977). The behavior in question, however, does not need to be experienced personally, as neighbors or friends who have had negative experiences can also influence landowners' attitudes (Brown and Thompson 1976; Siemer and Brown 1993). Liability for injuries incurred is another worry and riding OHVs may heighten the incidence of injury due to high speeds and maneuverability (Wright et al. 1990). Even though Minnesota and several other states have adopted recreation use statutes that grant landowners immunity from liability (Copeland 1998), the prospect of litigation and associated mental stress, and the potential for lost time have been found to be a strong disincentive for allowing access (Kaiser and Wright 1985, Kozlowski 1986).

Willingness to Allow OHV Access

Perceived benefits and negative impacts from OHV riding combine to form landowners' attitudes toward OHV access. OHV riding behaviors in turn have an affect on the perceived magnitude of benefits and negative impacts. For consumptive recreation types, landowners are susceptible to attitudinal bias where a landowner has an attitude regarding the appropriateness of an activity that affects the landowners' willingness to allow access. As an example, individuals living in an urban environment have been found more likely to have negative attitudes toward hunting than people in rural areas, and the growing rural landowners with urban backgrounds are more likely to post their land for this reason (Brown et al. 2000). Similarly, OHV riding may be incompatible with particular land use practices like agriculture or timber production, causing landowners to restrict access or it may help accomplish certain work tasks (Wright et al. 1990). Inappropriate behaviors like littering, gate or fence damage, and vandalism are also strong indicators of more restrictive access policies (Teasley et al. 1997).

Characteristics relevant to this study include type of OHV riding individuals are engaged in (work or play), location and timing of riding, and preexisting uses of the land. Relationship to the landowner may also influence access decisions. For example, in past studies nearly 50% of the sampled land acreage in Minnesota was found to be restricted to hunting for friends, family, and business associates (Wright et al. 1988). Other members of the public were excluded. Brown and colleagues (1983) found that individuals who use their own land for recreational purposes generally did not allow public access. As landowners increase recreational use of their land, public access decreases.

DATA COLLECTION METHODS

A survey of private landowners in an eight-county region in central Minnesota (Becker, Cass, Crow Wing, Hubbard, Morrison, Otter Tail, Todd and Wadena) was administered to assess landowner's attitudes toward OHV riding, and perceptions of the benefits and negative impacts informing their access and land management decisions. To inform design of the survey, and because little information exists regarding private landowner attitudes and perceptions of OHV

access, four focus groups were conducted in the region in early summer 2007. Results were used to create a survey questionnaire aimed at understanding the motivations of landowner access decisions and to characterize management concerns and approaches.

For the purposes of the study, private lands classified for tax purposes as seasonal recreation or timberlands were used to identify the sample population. Seasonal recreation landowners were selected because their lake cabins or other recreational lands are common in the region, and because their land is owned for the primary purpose of recreation. Timberland owners in the region were selected because they generally possess large parcels bordering tracts of public land, are frequently accessed by OHVs via state and county highways, and represent areas having key physical features desired by OHV riders (Schoenecker 2006; Snyder et al 2008). These landowners also have a reasonable chance to be affected by one of eight state-designated OHV trails and the nearly 37,000 registered ATVs users in the region (MN DNR 2005).

For the focus groups, a third category of participants were invited to participate, county land use planners and administrators. County officials commonly interact with private landowners, are responsible for maintenance of highway right-of-ways impacted by OHVs, and provide resources for enforcement of OHV rules and regulations. Nine individuals representing distinct social and professional networks were identified as having previous experience with OHV issues in the region either as individuals actively involved in OHV management, belonging to an OHV group, or who experienced OHV impacts on their property. They were asked to identify other individuals who would be knowledgeable of OHVs on private lands, could speak to issues germane to seasonal recreation and timberland owners or county officials, and who would be interested in speaking about their OHV experiences. A total of 53 people were invited to participate in six focus groups, of which 15 participants attended four focus groups (Table 1). The focus groups were designed using methods outlined in Krueger and Casey (2000) keeping in mind our objective of informing the scope of issues to be included in the survey (Morgan 1988; Stewart and Shamdasani 1990). Focus group participants included both OHV riders and non-OHV riders to stimulate dialogue.

Table 1. Focus group participants and meeting dates, 2007.

Group type	Date	Time	Location	Participants
Timberland	May 16, 2007	7:00 – 8:30 p.m.	Pine River, MN	4
Timberland	May 25, 2007	11:30 a.m. – 1:30 p.m.	Osage MN	2
Seasonal recreation	May 23, 2007	7:00 – 8:30 p.m.	Perham, MN	6
County officials	May 24, 2007	11:30 a.m. – 1:30 p.m.	Staples, MN	3

A total of 4,271 timberland and 47,812 seasonal recreation landowners were identified using 2006 county tax records in the eight-county region representing almost 6.9 million acres (Table 2). The sample population for the survey questionnaire was stratified by timberland (775 surveys sent) and seasonal recreation landowners (825 surveys sent) achieving a response rate of 60% and 51% respectively, with a sampling error of 5%.

Excluding some of the large corporate land owners in the region, the average size of timberland ownership was approximately 95 acres with an average of two parcels owned per landowner. A majority of seasonal recreation properties were less than 1 acre in size, but the average size of all seasonal properties was 8.2 acres and an average of 1.4 parcels owned per landowner. The

average age of landowner respondents was 59, was typically a Caucasian male, with an average household income of more than \$65,000.

Table 2. Profile of landowners in the Minnesota Sustainable Development Partnership region, 2006

County	Timberland			Seasonal Recreation		
	Landowners	Acres	Parcels	Landowners	Acres	Parcels
Becker	648	51,934	863	4,870	29,383	6,468
Hubbard	468	69,522	1,522	5,553	74,838	8,233
Cass	915	82,362	1,485	11,303	103,116	15,429
Crow Wing	1,164	106,441	3,203	8,515	50,947	13,873
Morrison	52	11,330	156	2,963	47,142	4,992
Todd	26	14,934	225	3,632	5,538	3,730
Wadena	18	2,147,263	252	886	3,966,281	1,137
Otter Tail	980	65,276	1,001	10,090	72,107	10,924
TOTAL	4,271	2,549,062	8,707	47,812	4,349,352	64,786

RESEARCH FINDINGS

The focus group discussions were digitally recorded and analyzed for key themes within and across focus group types. A summary document, along with original focus group notes, was used to analyze the results in the context of attitudinal responses and land management actions taken. Concepts or themes to emerge but not directly related to the research questions were included in the survey as space permitted. Common language used and understood by the participants was also noted for use in the wording of survey questions.

Though the topics of discussion revolved most around attitudes and perceptions regarding access to private lands, focus group discussions were threaded among OHV issues on public lands, enforcement, and landowner-rider responsibilities (Table 3). Findings are grouped into one of four categories: (1) perceived benefits; (2) perceived negative impacts; (3) riding characteristics; and (4) management responses. The focus group findings are further organized by group type, discussion intensity, and whether specific landowner management actions were initiated.

Perceived Landowner Benefits

Focus Group Findings

A high percentage of the focus group participants had ridden or owned OHVs, and nearly all timberland participants owned or used OHVs for work purposes. However, timberland users perceive their use as different and separate from recreational riding, which led to distinctions as to appropriateness of riding behavior and acceptability for where riding takes place. Focus group participants perceived OHVs as a way to increase mobility for daily trips to town or around their property. Discussions related to increased mobility, not only for physically handicapped, led to recognition that designated routes or corridors linking private property to destinations are needed and that maintenance of existing corridors along highways would increase rider safety.

An idea discussed within each focus group was that OHV riders demand different kinds of riding experiences, and that having dedicated riding areas is a means to isolate recreational riding that

subsequently causes conflict with nonmotorized activities. Fee-based programs, or “pay-to-play” as it was commonly referred, were discussed in the context of landowners charging fees for use of their property. Landowners could also lease their land to county or state entities or to corporate OHV manufacturers in the state, who in turn could provide managed access. In terms of economic benefits, OHV riding contributes more than \$600 million annually to Minnesota’s economy (Schneider and Schoenecker 2006). Trailside businesses and private OHV riding areas were discussed as ways to capture economic benefits locally, but it was the seasonal recreational landowners and county officials who thought these most realistic. Timberland owners acknowledged that the ability to benefit financially would be a reasonable incentive to providing access but expressed doubt that they themselves would participate.

Table 3. Focus group results of perceptions and attitudes towards OHV access on private lands.

Attitudinal Responses	Groups that discussed¹	Discussion intensity²	Resulted in landowner action
Perceived Benefits			
Increased efficiency of work tasks	All	High	No
Efficient transportation	All	High	No
Hunting tool to haul game or access trailhead	All	Moderate	No
Contact with family, friends, and neighbors	SR, CO	Moderate	No
Increased tourism and traffic through town	SR, CO	Moderate	No
Access for physical handicapped or challenged	All	Low	No
Income from OHV riding fees or tax credits	All	Low	No
Perceived Negative Impacts			
Driveway approach or road damage	All	High	Yes
Noise interrupting quiet or causing annoyance	All	High	No
Liability of landowner for rider injuries	All	High	No
Interfering nonmotorized recreation	All	High	No
Gate or fence damage; inappropriate use	TB, SR	High	Yes
Wetland plant or soil damage	All	Moderate	Yes
Ground damage or rutting	All	Moderate	No
Spread of invasive plants	All	Low	No
Vegetation loss due to compaction	All	Low	Yes
Soil erosion or compaction	All	Low	Yes
Littering near buildings on or off-trail	TB, SR	Low	No
Riding Characteristics			
Location by land type, slope, and wetness	All	High	Yes
Age of riders	All	High	No
Speed of riders	TB	Moderate	No
Time of year (season)	All	Moderate	No
Number of riders riding together	TB, CO	Low	No
Frequency of riding (times per year)	TB, SR	Low	No
Other Issues			
Lack of effective enforcement	All	High	Yes
Lack clear policies across jurisdictions	All	High	No
Lack of clear trails, rules, signage	All	High	No

¹ Focus group landowner types are seasonal recreation (SR), timberland (TB), and county officials (CO).

² Strong sentiments, emotional expressions, and repeated accounts contribute toward a higher intensity.

Survey Findings

Based on these findings, a number of benefits of OHV riding were included in the survey questionnaire. In particular, we asked respondents to indicate the importance of using OHVs for completing work tasks, transportation, contact with friends and neighbors, hunting assistance,

economic benefit, and handicap access (Appendix A). Results were compared by type of landowner, whether or not they ride OHVs, number of years they have owned their property, and size of ownership.

The results presented in Table 4 show the percentage of respondents perceiving benefits as either “somewhat important” or “very important.” Mean responses indicate that persons who ride OHVs perceive the benefits of OHVs differently than non-OHV riders ($p < 0.05$ level). The results are also statistically different among the size of landowners and the number of years they have owned their property. Only the use of OHVs for transportation, economic gain, and hunter assistance were different between timberland and seasonal recreation landowners.

OHV riders perceive increased work productivity, hunter assistance, and an efficient mode of transportation, as well as a providing a safe place to ride as key benefits of riding on their property. Income generated from the fees paid by riders, access for physically handicapped and contact with friends and neighbors were much less important. Not surprising, significantly fewer non-OHV riders perceived benefits of OHV riding on their property. In terms of how long respondents had owned their property, landowners who have owned their property for less than 10 years perceived the benefits of hunter assistance, increased work productivity, and a safe place for their families to ride as most important. Those owning their parcels the longest also scored high on these benefits though with less frequency. Finally, the size of ownership influenced responses with similar results. Hunter assistance, safe place for family to ride, efficient transportation, and increased work productivity were perceived as the greatest benefits. Those owning a combined 80 acres or more perceived these same benefits but with greater frequency and more than half perceiving them as either somewhat or very important.

When asked about the percentage of time participating in different types of OHV riding, recreational riding was the most frequent type, followed by riding for hunting and work-related activities (Figure 2). This is consistent with participation rates found by Schneider and Schoenecker (2006). When assessed by type of landowner, timberland owners were found to spend most of their time using OHVs for work-related activities (45%). But when compared by the total number of users, the greatest number engaged in OHV riding for hunting (52%) and general recreation (50%). Seasonal recreation landowners most engage in OHV riding for general recreation purposes with approximately 54% of their time in related activities.

In terms of where riders most engaged in riding activities, respondents identified their personal property as the most frequent (3.5 on a scale of 1-5, 5 being “very often” and 1 being “never”) (Figure 3). Timberland owners also like riding along roads, shoulders and driveways, whereas seasonal recreation landowners tend to ride on public lands more than timberland owners and more so along roads, shoulders and driveways. Designated OHV areas were rarely used by either landowner type surveyed (1.9 on the 5-point scale).

Table 4. Percent of landowners perceiving benefits of OHV riding as “somewhat important” or “very important” (N=879), 2007.¹

Landowner Type	Increase work productivity	Efficient transport	Contact with neighbors	Contact with friends	Safe for family	Income from riders	Local economic gain	Access for physically handicapped	Hunter assistance
OHV rider	52.2	55.0	22.5	28.7	59.5	1.8	7.4	17.1	60.9
Non-OHV rider	22.0	16.3	9.5	12.1	18.3	2.1	3.2	14.7	22.5
Owned 0-10 yrs	42.0	39.8	18.3	24.0	43.2	1.8	5.7	20.3	46.6
Owned 11-20 yrs	39.1	39.3	15.4	19.3	41.6	2.2	6.0	14.3	48.1
Owned over 20 yrs	31.6	30.3	13.6	17.4	32.9	1.5	4.0	12.7	34.3
Own 0-5 acres	27.8	23.7	13.1	15.4	25.1	1.5	5.9	14.5	24.5
Own 6-20 acres	42.0	32.4	15.7	22.9	33.8	2.8	8.3	15.5	29.6
Own 21-80 acres	37.7	37.4	16.2	20.7	41.3	1.9	4.1	13.7	49.3
Own over 80 acres	48.5	53.1	19.2	25.8	57.7	2.1	4.6	20.0	61.4

¹All results are statistically significant at the 0.05 level.

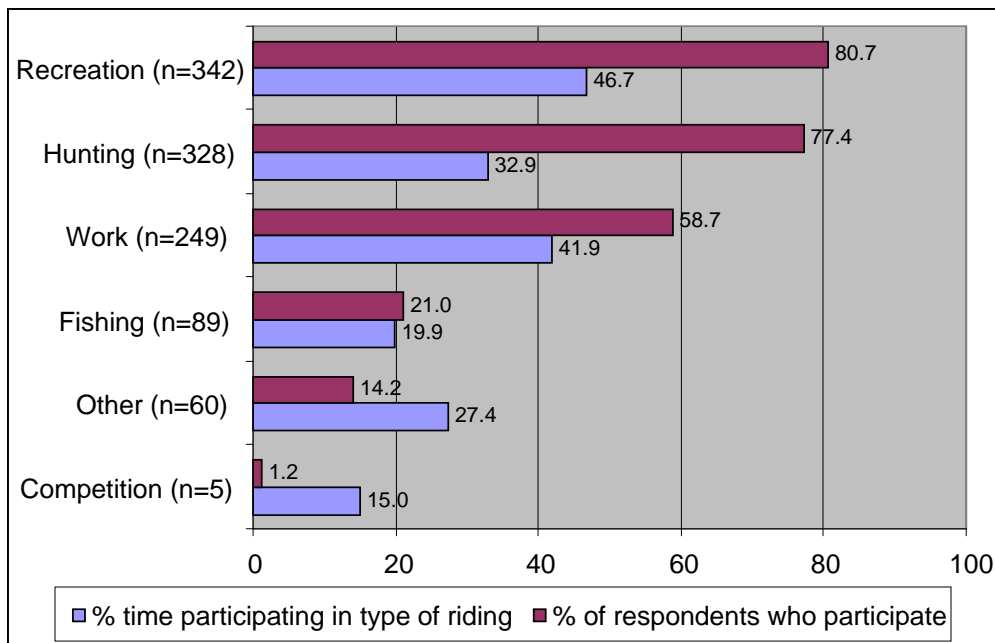


Figure 2. Percent of time using OHVs in various activities among landowners who ride, 2007.

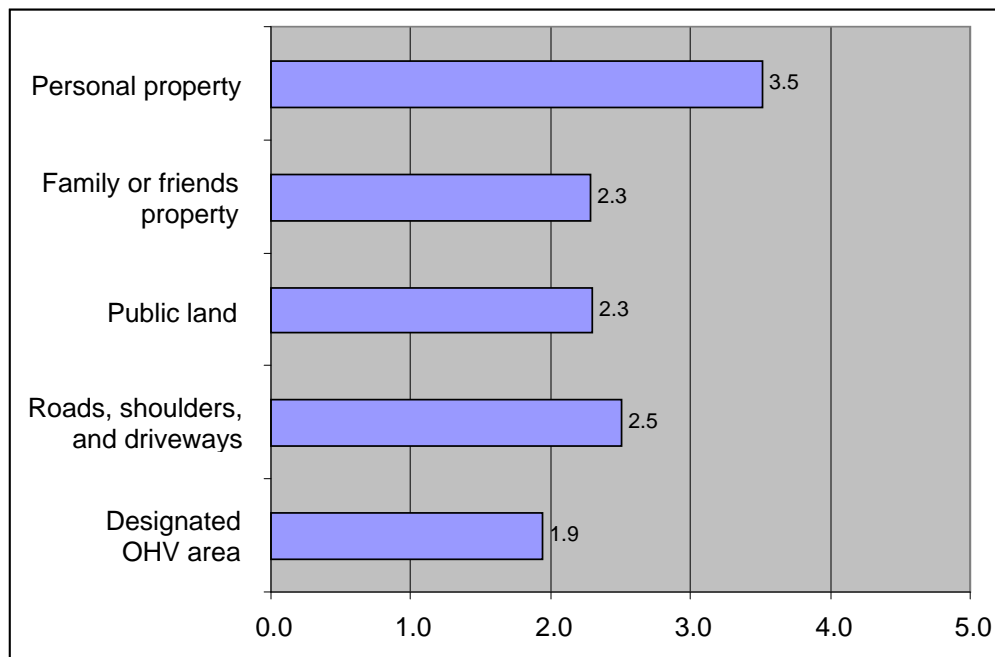


Figure 3. Where landowners use OHVs (scale: 1=never, 2=rarely, 3=sometimes, 4=often, 5=very often) (N= 417), 2007.

Perceived Negative Impacts

Focus Group Findings

Damage to driveway approaches, existing trails, dirt roads, and bituminous shoulders of public highways generated intense discussion among focus group participants (Table 3). These are places where public and private lands intersect, allowing OHVs to traverse across multiple land

types easily. They are also where restrictive action is perhaps the most challenging, and was identified in the focus groups as key areas and vectors of conflict between landowners and OHV riders. Concern was most intense where participants had witnessed first hand or had heard stories of from immediate family, friends, and neighbors about damage caused by OHVs.

Focus group participants were also particularly concerned about noise and the interference with nonmotorized recreation. The possibility of OHVs accessing, consciously or not, private lands from state designated trails or public highways further exasperated areas of conflict. There was also concern, though with less intensity, that OHVs would negatively impact wetlands, soils, vegetation, and increase the spread of invasive plants.

Gate and fence damage was reported by some timberland owners who thought it was likely from OHV riders driving through partially closed gates and vandals taking down fences for easier access. All had been forced at some point to mend fences or repair gates as a result. A related concern was for liability. There existed varying levels of knowledge among participants of the legal rights and responsibilities of landowners, and several stories were told of “someone up the road” who had been successfully sued by an OHV rider who had been injured while trespassing on their property. The timberland focus groups especially perceived this a significant issue.

The word “damage” was used frequently to describe the effects of OHVs without consensus on what constitutes damage. Many participants referred to damage as a physical impact like soil erosion and compaction, or loss of vegetation. Some timberland owners characterized damage in terms of actions necessary to mitigate for impacts such as replanting herbaceous plants or refilling areas where soil had been eroded. Damage was also used to describe a range of negative impacts referencing noise, litter, and interference with other motorized and nonmotorized users.

Survey Findings

Based on these focus group findings, both negative environmental and human impacts of OHV riding were incorporated into the survey design. In particular, we asked survey respondents to indicate damage to natural resources, damage to timber and agriculture crops, damage to roads and structures, and concerns about liability, noise, and interference with hunting and other forms of recreation (Appendix A). Results were compared by type of landowner, whether they ride OHVs, number of years they have owned their property, and size of ownership.

Similar to the findings of benefits, mean responses indicate that persons who ride OHVs perceive negative impacts differently than non-OHV riders ($p < 0.05$) (Table 5). The greatest percentage of riders perceived impacts from OHVs from littering followed closely by vandalism and interference to hunting. Non-OHV riders similarly identified vandalism but identified impacts to soils, wetlands, vegetation, and wildlife as significant, as well as noise and liability concerns. More than 80% of non-OHV riders were concerned about these impacts. In terms of how long respondents had owned their property, impacts to soils and vegetation, spread of invasive species, roadside damage, and interference with OHV riding were statistically different. Damage to soils and vegetation received the greatest concern, and among those owning their property more than 10 years were more concerned than those owning their property for less time. Size of ownership had little influence except for concerns for wildlife and hunting disturbance, noise, and spread of invasive species. Those owning a combined 80 acres or more were most concerned

Table 5. Percent of landowners perceiving negative impacts of OHVs as “moderately concerned” or “very concerned” (N=879), 2007.

Landowner Type	Vegetation damage	Spread of invasives	Soil damage	Timber damage	Crop damage	Wetland damage	Noise	Wildlife disturbance	Hunting Interference
OHV rider	67.4	56.0	75.4	57.3	51.3	74.2	63.7	72.8	77.7
Non-OHV rider	82.6	69.4	85.2	74.1	60.1	80.4	80.3	82.9	69.8
Owned 0-10 yrs	70.4	65.3	75.3	64.6	55.5	75.8	68.5	75.9	74.0
Owned 11-20 yrs	73.0	53.3	81.9	62.5	51.2	77.0	73.5	79.0	74.1
Owned over 20 yrs	79.7	65.3	83.4	68.2	58.8	78.6	72.9	78.4	74.7
Own 0-5 acres	76.6	66.1	79.9	67.1	57.2	77.9	75.7	73.8	61.5
Own 6-20 acres	74.8	64.0	78.0	65.3	57.4	79.2	72.0	81.1	84.8
Own 21-80 acres	73.8	51.6	81.1	69.2	39.0	65.2	66.7	73.0	60.3
Own over 80 acres	73.8	58.9	81.2	64.0	57.3	79.6	69.8	81.2	81.5

Landowner Type	Interfere nonmotorized rec	Interfere OHV riding	Structural damage	Driveway damage	Road damage	Litter	Vandalism	Liability concern	Threat to safety
OHV rider	60.4	47.1	62.8	64.5	54.5	79.4	76.3	74.4	54.8
Non-OHV rider	75.1	33.7	71.0	76.7	68.7	83.7	85.2	80.4	62.3
Owned 0-10 yrs	66.8	43.9	64.2	64.6	59.6	81.5	77.0	77.0	60.3
Owned 11-20 yrs	64.8	36.4	65.1	73.9	61.3	78.9	80.7	75.9	52.1
Owned over 20 yrs	69.2	40.6	69.2	72.7	64.0	82.6	83.2	78.7	60.5
Own 0-5 acres	69.2	38.5	66.5	70.5	62.9	78.1	77.5	72.8	57.8
Own 6-20 acres	66.8	43.0	67.2	71.5	58.0	85.9	83.0	81.0	58.2
Own 21-80 acres	60.0	25.8	50.8	56.9	58.7	74.2	73.4	73.0	54.8
Own over 80 acres	70.2	45.2	71.3	74.3	66.1	81.9	84.7	80.4	61.4

about wildlife disturbances and hunting interference, while those with fewer acres were most concerned about wildlife but also noise.

We also asked about the location of where impacts have been observed to verify them and to assess the degree to which experiences with particular types of impacts influenced personal perceptions. Among respondents indicating they were either “moderately” or “very concerned” about negative impacts, the majority have not personally experienced impacts on their own land. This is consistent with the focus group findings and highlights that most impacts for which people were concerned were either not observed at all or were more common on public lands. Among the impacts experienced most by property owners were liability issues, littering, hunting and wildlife disturbances, and damage to vegetation and soils. Other observed impacts on private property other than their own focused most on damage to driveways, and to soils and vegetation. Spread of invasive plants, threats to personal safety, interference with OHV riding, and damage to crops were among the least observed impacts and of lowest concern.

Willingness to Allow OHV Access

Focus Group Findings

Discussion of OHV riding characteristics was an underlying topic in every focus group. It was important, therefore, to design survey questions to address various types of riding behaviors that might influence landowner access policies. Focus group findings with respect to those behaviors reveal that the age of riders was a primary concern as it relates to safety, maturity of actions, and being of a legal age to drive. Sensitivity to young riders killed or injured in OHV accidents was especially prevalent among seasonal recreation landowners, but all groups expressed concern for young riders who may be inexperienced. Speed was also a primary concern; the faster the machine travels, the less acceptable the behavior.

All groups expressed that the specific location of riding on their property was of concern, whether by the public or by family and friends. The location, be it on trail, steep slope, or through a wetland, made a difference in how timberland focus group participants talked about acceptability of riding, and a few landowners had physically blocked access to specified areas unacceptable for riding. Some seasonal landowners in the focus groups allow OHV riders to travel across their property along trails, access roads, driveways, and other areas. They perceive these areas as key linkage points and that the damage caused by OHVs would be minimal.

In terms of their own riding preferences, both timberland and seasonal recreation landowners said they used trails, roads, driveways, and if off-trail riding was necessary, they preferred forest edges and dry upland areas. Some landowners also described a “herd mentality” among large groups of riders described as “if one of them tears off trail, or jumps a ditch, the rest soon follow.” Others, though, argued that larger groups were more likely to ride slower than groups of two to five because large groups tended to have a wider range of ages and experiences, forcing them to slow down. The interaction of these factors with how property is used and landowner attitudes toward OHVs influences their willingness to allow access, which may differ when compared to family members, friends, and the general public.

Survey Findings

To better understand landowner access policies and how perceptions influence attitudes, it is useful to understand first how landowners use their property and who is currently allowed access. Figure 4 identifies current uses as reported in the survey. The results indicate a correlation between timberland uses and OHV riders, and with seasonal recreation land uses and non-OHV riders. On the one hand, timberland owners use their property most for hunting followed by solitude and escape, whereas seasonal recreation landowners use their property most for solitude and escape followed by fishing, which are significantly greater than for timberland owners ($p < 0.01$). While timberland owners engaged in more hunting and forestry activities than seasonal recreation landowners, they use their property significantly less for fishing and birding. Interestingly, only a small fraction of timberland owners indicated that they use their property for the production of forest products. ATV and snowmobile use was similar for both landowner types. OHV riders tended to use their property most for hunting followed by solitude and escape, and nonriders use their property most for solitude and escape but also fishing. Predictably, OHV riders used their property more than nonriders for related motor-sport activities. Hunting was seldom done on seasonal recreation lands, most of which are less than one acre in size.

Respondents were then asked to identify who they grant OHV access to, if anyone (Figure 5). A majority, regardless of type or number of acres and years owned, do not currently allow OHV access (64%). Of those who do, 72% permitted family and friends to ride on their property (26% of all landowners). Only 8% of respondents allow access to the general public (3% among all landowners). This is generally consistent with Wright et al. (1990), who found in their study that of those allowing recreation access 47% restricted access to friends, family, and close associates; 25% reserved exclusively for themselves; and 24% granted open public access. However, only 35% of those lands open to the public in the Wright et al. (1990) study were open for consumptive uses like OHV riding (or about 8% of all landowners). Our findings show a greater percent of landowners granting access to family and friends, but similar access policies for the general public.

Willingness to allow OHV access to family and friends versus the general public were significantly different. When compared among only family and friends, landowner access policies were also significantly different between timberland and season recreation landowners and between OHV riders and nonriders (Table 6). Timberland owners were either “slightly” or “completely” willing to allow access most in situations where speeds were below 10-mph (41%), the size of riding groups were small (1-3 people) (44.7%), where riders are 16-years of age or older (49.9%), riding five or fewer times per year (55%), riding during the summer or fall (48.1%), and when noises are kept low (56.1%). Seasonal recreation landowners identified a similar order but were less willing than timberland owners to allow OHV access.

When compared to OHV riders, nonriders were predictably less willing to allow access on their property by family and friends, but 25% were still willing to allow access if speed, noise levels, and the number of riders is low, 22% if riders ask permission, are older than 25-years of age, and access their property fewer than five times per year. Landowners who ride OHVs similarly allow access in these instances but with much greater frequency (60-75%). Among the least acceptable instances is where riders are less than 12-years of age, speeds and noise are high, and where riding is on steep slopes and in water-crossings or wetlands.

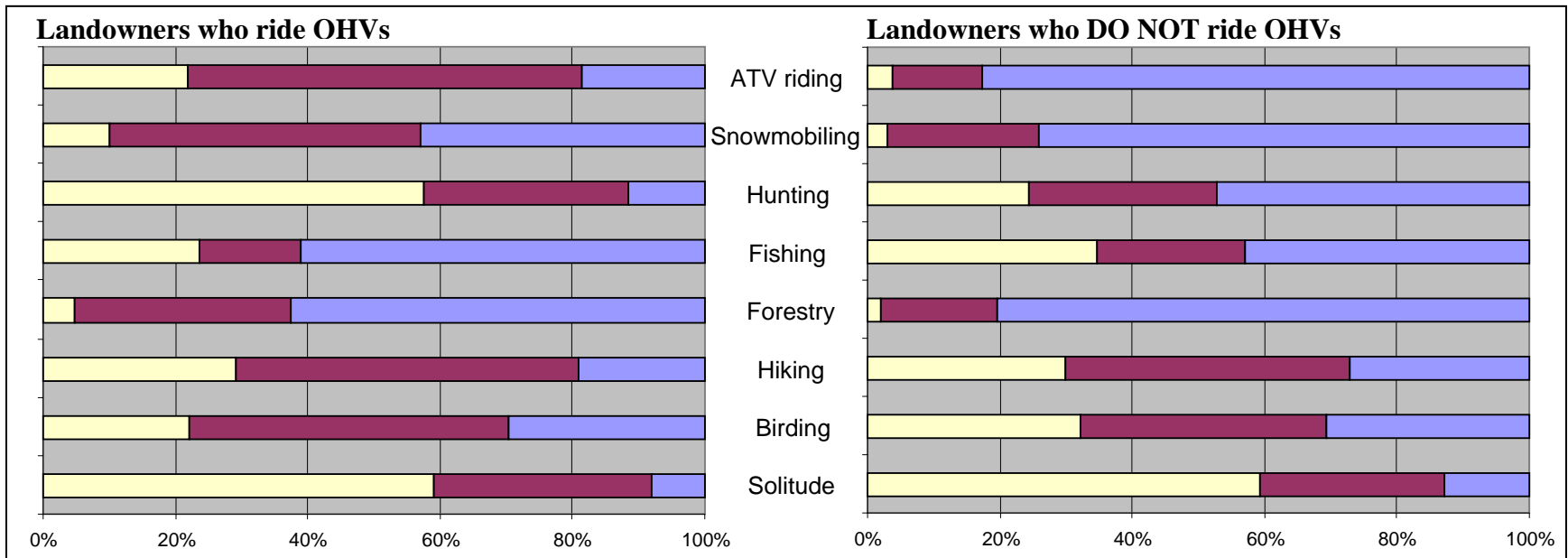
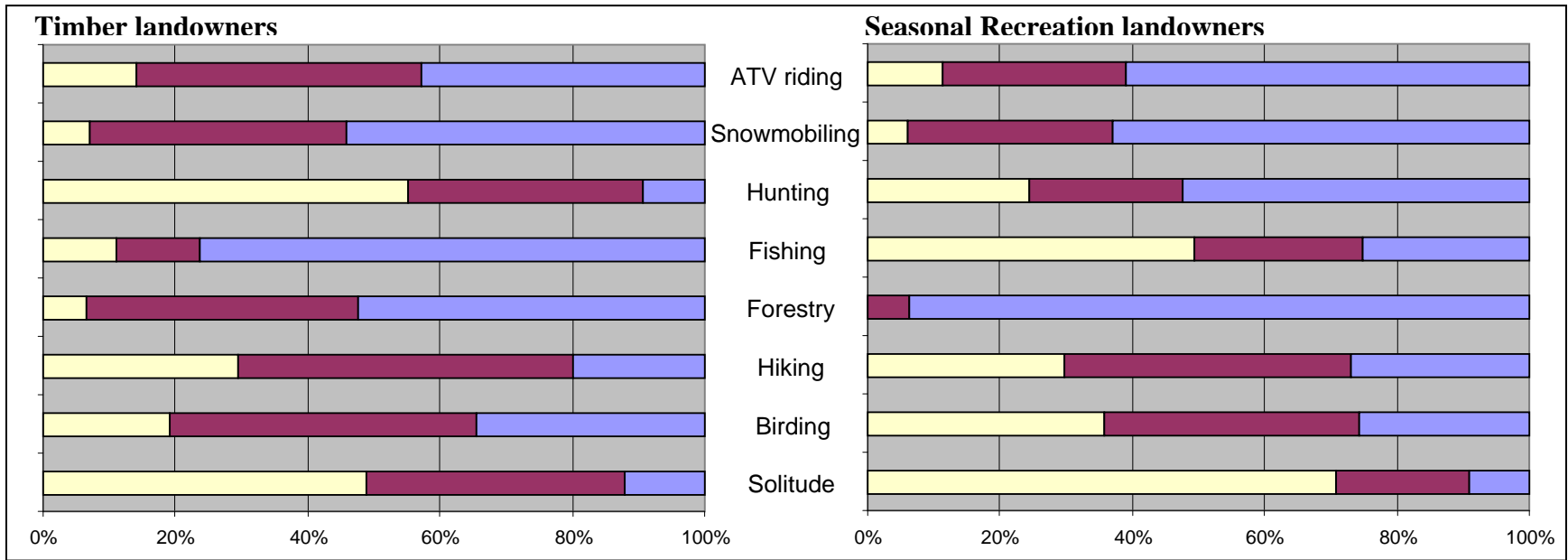
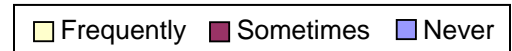


Figure 4. Frequency of land use by type of activity and landowner (N=800), 2007.



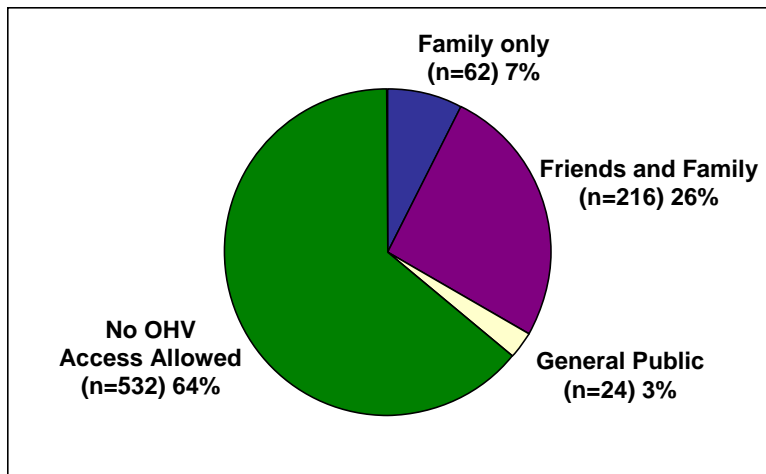


Figure 5. Percent of landowners allowing OHV access by type (N=834), 2007.

Additional analysis reveals that as the number of acres owned increased, landowners were also more willing to allow access ($p < 0.01$). In several instances, willingness to allow access exceeded those opposing it for properties greater than 20 acres, except where riders are less than 16-years of age, accessing property more than five times per year, in wetlands or on steep slopes, impacting more than one square mile, during the spring or hunting season, and high noise levels. Liability was important for some landowners, but overall it appears to be less of an issue than indicated in past studies, within the focus groups, or as opposed to asking for permission.

When compared to length of time of ownership, those owning parcels less than 20 years tended to be more willing to allow OHV access than those owning for longer periods of time, with the exception where riders were under the age of 16 years, riding in prairies or wetlands and on steep slopes, or during the hunting season. Those owning parcels for less time were more willing than not to allow access when speeds were kept below 10 mph, only one rider was present, the age of the rider is 16 years old or older, when access is fewer than five times per year, along driveways during the winter or summer months, and when the rider asks permission.

Landowner willingness to allow OHV access was also assessed for the general public. A significant difference exists between riders and nonriders ($p < 0.01$) but none between timberland and seasonal recreation landowners (Table 7). Similar trends in responses were observed for the general public as for friends and family but with significantly lower willingness to allow access. Most landowners strongly oppose any OHV use on their property by the general public. The greatest areas of concern are again related to the age and speed of riders, location of riding, noise, and if permission was sought. In addition, time of year was an important factor. No significant difference was found among the size of ownership or years owned. Although not a substantial amount, as high as 17% of landowners who ride OHVs indicated they would be willing to allow general public access in specific situations such as those previously identified relating to the age of riders, speed, number or riders, location, noise levels, and if riders ask for permission. This is higher than the number of landowners who currently report to allowing public access and higher than found in previous studies, which indicates that riding behaviors have an important influence on landowners' attitudes toward OHV access and if controlled for may increase landowner willingness to grant access.

Table 6. Percent of landowners willing to allow OHV access to family and friends, 2007.¹

	----- Landowner Type -----			----- OHV Use -----		
	Seasonal rec	Timberland	Asymp. Sig. (2-sided)	Rider	Nonrider	Asymp. Sig. (2-sided)
Speed of Riders						
Less than 10 mph	41.0 (154)	56.8 (242)	0.000	75.1 (292)	25.1 (98)	0.000
10-20 mph	26.8 (99)	39.0 (161)	0.002	53.2 (201)	13.9 (53)	0.000
More than 20 mph	11.9 (43)	19.1 (77)	0.073	25.5 (95)	7.0 (26)	0.000
Number of Riders						
One rider	39.2 (142)	55.7 (225)	0.000	73.4 (268)	24.1 (91)	0.000
Two or three riders	30.0 (109)	44.7 (186)	0.000	61.7 (237)	14.7 (55)	0.000
Four or more riders	15.2 (54)	24.5 (99)	0.010	34.6 (128)	6.8 (25)	0.000
Age of Riders						
Less than 12 years of age	9.1 (33)	14.4 (58)	0.009	18.6 (68)	6.1 (23)	0.000
12-15 years of age	21.6 (79)	28.6 (115)	0.117	40.9 (152)	10.5 (39)	0.000
16-25 years of age	36.1 (133)	49.9 (209)	0.002	68.5 (265)	18.3 (69)	0.000
Older than 25 years of age	40.5 (145)	58.4 (240)	0.000	77.5 (292)	22.5 (83)	0.000
Frequency of Riding						
Less than five times per year	37.5 (133)	55.0 (224)	0.000	72.0 (265)	22.9 (85)	0.000
Five to ten times per year	26.3 (93)	39.1 (158)	0.001	51.4 (190)	15.7 (57)	0.000
More than ten times per year	21.4 (76)	28.2 (114)	0.292	42.1 (157)	8.5 (31)	0.000
Location of Riding						
Woodlands	34.1 (122)	48.7 (210)	0.001	65.3 (260)	18.5 (68)	0.000
Prairies	21.7 (72)	31.2 (119)	0.005	44.2 (151)	11.2 (39)	0.000
Water crossings or wetlands	12.2 (41)	14.2 (56)	0.687	20.4 (73)	6.9 (24)	0.000
On steep inclines	8.6 (29)	13.0 (51)	0.102	17.4 (62)	5.1 (18)	0.000
On driveways or along roads	37.2 (132)	45.9 (186)	0.090	62.8 (236)	20.9 (76)	0.000
½-mile or less from buildings	27.2 (90)	35.2 (132)	0.010	45.8 (162)	13.9 (50)	0.000
Size of Riding Area						
Less than ½ square mile used	29.2 (100)	43.1 (170)	0.000	56.8 (201)	18.0 (65)	0.000
½ - 1 square mile used	19.4 (63)	28.9 (107)	0.011	42.5 (142)	8.2 (28)	0.000
More than 1 square mile used	19.1 (62)	27.1 (100)	0.024	38.2 (126)	10.2 (35)	0.000
Time of Year Riding:						
Winter	37.6 (132)	44.3 (183)	0.154	61.0 (228)	21.6 (79)	0.000
Spring	26.1 (92)	36.3 (149)	0.015	51.1 (193)	12.7 (46)	0.000
Summer	36.6 (133)	48.1 (201)	0.002	67.1 (261)	19.2 (71)	0.000
Fall	35.2 (124)	51.3 (217)	0.000	67.1 (261)	20.3 (74)	0.000
During hunting season	26.3 (93)	37.2 (156)	0.011	47.5 (184)	16.6 (60)	0.000
Noise level created by riders						
Low	40.7 (145)	56.1 (240)	0.000	73.1 (285)	25.1 (93)	0.000
Moderate	19.5 (67)	27.6 (109)	0.008	37.7 (136)	11.5 (41)	0.000
High	4.8 (16)	9.5 (37)	0.031	11.8 (41)	3.4 (12)	0.000
Riders sign liability waiver	20.9 (339)	28.4 (394)	0.056	34.7 (125)	15.5 (55)	0.000
Riders ask for permission	34.3 (362)	44.5 (425)	0.003	57.6 (227)	22.6 (84)	0.000

¹ Number of respondents in parentheses.

Table 7. Percent of landowners willing to allow OHV access to the general public, 2007.¹

	----- Landowner Type -----			----- OHV Use -----		
	Seasonal rec	Timberland	Asymp. Sig. (2-sided)	Rider	Nonrider	Asymp. Sig. (2-sided)
Speed of Riders						
Less than 10 mph	9.2 (35)	8.7 (38)	0.886	13.6 (55)	4.3 (17)	0.000
10-20 mph	7.1 (27)	6.5 (28)	0.301	10.3 (41)	3.3 (13)	0.000
More than 20 mph	2.9 (11)	3.3 (14)	0.896	4.5 (18)	1.8 (7)	0.019
Number of Riders						
One rider	8.3 (31)	9.0 (39)	0.928	13.0 (51)	4.6 (18)	0.000
Two or three riders	8.7 (33)	8.5 (37)	0.769	13.6 (55)	3.6 (14)	0.000
Four or more riders	7.1 (27)	5.1 (22)	0.474	9.3 (37)	3.1 (12)	0.000
Age of Riders						
Less than 12 years of age	3.2 (12)	3.4 (15)	0.950	4.8 (19)	1.8 (7)	0.021
12-15 years of age	5.3 (20)	5.3 (23)	0.753	7.8 (31)	3.1 (12)	0.006
16-25 years of age	9.2 (35)	6.9 (30)	0.476	11.7 (47)	4.6 (18)	0.000
Older than 25 years of age	10.1 (38)	9.1 (40)	0.819	14.7 (60)	4.4 (17)	0.000
Frequency of Riding						
Less than five times per year	8.2 (31)	8.3 (36)	0.995	12.5 (50)	4.1 (16)	0.000
Five to ten times per year	6.7 (25)	6.2 (27)	0.959	10.2 (40)	2.8 (11)	0.000
More than ten times per year	6.1 (23)	4.8 (21)	0.644	8.5 (34)	2.6 (10)	0.000
Location of Riding						
Woodlands	10.6 (40)	8.2 (36)	0.434	14.3 (58)	4.6 (18)	0.000
Prairies	8.4 (31)	3.8 (16)	0.016	8.0 (31)	3.6 (14)	0.001
Water crossings or wetlands	5.1 (19)	2.8 (12)	0.216	5.6 (22)	2.1 (8)	0.005
On steep inclines	3.5 (13)	2.6 (11)	0.521	4.3 (17)	1.6 (6)	0.002
On driveways or along roads	9.1 (34)	8.3 (36)	0.559	14.3 (57)	3.1 (12)	0.000
½-mile or less from buildings	7.6 (28)	5.6 (24)	0.339	10.8 (42)	2.6 (10)	0.000
Size of Riding Area						
Less than ½ square mile used	7.0 (26)	6.9 (30)	0.537	10.3 (40)	3.8 (15)	0.000
½ - 1 square mile used	6.9 (25)	5.4 (23)	0.624	9.0 (35)	3.4 (13)	0.000
More than 1 square mile used	7.2 (26)	5.2 (22)	0.446	8.6 (33)	3.9 (15)	0.000
Time of Year Riding:						
Winter	11.4 (43)	9.1 (40)	0.359	14.3 (57)	6.1 (24)	0.000
Spring	8.6 (32)	7.4 (32)	0.812	12.0 (48)	4.2 (16)	0.000
Summer	10.8 (41)	8.7 (38)	0.572	15.1 (61)	4.9 (19)	0.000
Fall	10.9 (41)	8.5 (37)	0.469	14.6 (59)	4.9 (19)	0.000
During hunting season	8.6 (32)	5.7 (25)	0.263	9.5 (38)	4.4 (17)	0.012
Noise level created by riders						
Low	12.2 (46)	9.9 (43)	0.574	15.9 (64)	6.2 (24)	0.000
Moderate	6.3 (23)	5.2 (22)	0.695	8.4 (33)	3.4 (13)	0.000
High	2.2 (8)	2.3 (10)	0.808	3.1 (12)	1.6 (6)	0.140
Riders sign liability waiver	6.3 (23)	7.9 (34)	0.421	10.4 (41)	4.0 (15)	0.000
Riders ask for permission	10.8 (41)	12.4 (54)	0.384	17.0 (69)	6.4 (25)	0.000

¹ Number of respondents in parentheses.

To reduce confusion with the number of variables considered, attributes of OHV access were factor analyzed. Two factors emerged as important: allowable riding behaviors on private land and unallowable activities (Table 8). These factors explained 74.9% of the variance for family and friends, and 82% of the variance for the general public. Allowable riding behaviors for friends and family included low noise levels, riders 25 years of age or older, single riders, infrequent access (riding fewer than 5 times per year), and speed of riders less than 10 mph. Unallowable activities in order of importance included high noise levels, four or more riders per group, riding on steep inclines or in water-crossings and wetlands, and riding more than 20 mph.

For the general public, allowable riding behaviors were similar to those for family and friends (Table 8). Low noise level was the most important factor followed by the time of year (summer, fall, and winter), proximity to buildings (more than ½-mile), and asking permission. Age of riders, frequency, and number of people in a group were also important factors but not as important for family and friends. Also, having riders sign a liability waiver was more important for the general public. Unallowable activities were also similar with the age and speed of riders being the most significant concerns. Riding in water-crossings or wetlands were significant, followed by high noise and frequency of riding.

Table 8. Factor loadings for important landowner considerations for allowing OHV access, 2007.

Survey Items	--Friends and Family--		--General Public--	
	Allowable behavior	Unallowable activities	Allowable behavior	Unallowable activities
Noise level created by riders is low	0.920		0.859	
Age of riders more than 25 years	0.912		0.801	
Frequency of riding less than 5 per year	0.907		0.794	
Number of riders is one	0.907		0.783	
Speed of riders is less than 10 mph	0.905		0.750	
Riding during the summer	0.853		0.856	
Age of riders 16 – 25 years	0.846		--	
Riders ask for permission	0.833		0.817	
Proximity to buildings more than ½-mile	0.826		0.821	
Riding during the fall	--		0.836	
Riding during the winter	--		0.824	
Riders sign a liability waiver	--		0.793	
Noise level created by riders is high		0.786		0.763
Number of riders is four or more		0.785		0.732
Location of riding on steep inclines		0.775		0.771
Speed of riders is more than 20 mph		0.769		0.833
Riding in water-crossings or wetlands		0.739		0.734
Age of riders less than 12 years		0.705		0.857
Frequency of riding more than 10 per year		0.673		0.750
Age of riders 12-15 years		--		0.768
Eigen Value	17.4	8.8	16.5	12.2
Alpha (α)	0.83	0.83	0.77	0.77
Variance explained (%)	49.6	25.2	47.2	34.8

Landowner Management Actions

Focus Group Findings

Focus group participants were asked about management actions taken by landowners in response to or in anticipation of negative impacts, or to achieve desired benefits. Most items discussed identified ways to minimize negative impacts or actions taken as a result of the negative impacts. For instance, timberland and seasonal recreation landowners commonly described repairing driveway approaches blocked or worn away by OHV ditch riding and jumping (Table 3). County officials also commented that highway crews have difficulty keeping up with OHV damage to bituminous shoulders. Some landowners have placed obstacles such as gates or barriers to prohibit riding in certain locations. Participants also discussed the need to repair damage to wetlands, sensitive soils, and to replace vegetation.

Focus group participants also identified particular actions that state or local authorities could take. For instance, improved signage and increased enforcement were two key areas. The perception was that signage is unclear, is posted sporadically, and is largely absent in most locations. Improved signage would reduce illegal access, but also clarify laws and appropriate riding behavior. Some participants argued that signs announcing “open to motorized vehicles” would be more effective than the current situation, which is open access unless posted otherwise.

In terms of enforcement, most landowner participants did not know which agencies have authority to manage OHV recreation, and therefore with whom they could inquire. County participants argued that some work done by county governments to manage for OHVs should be managed by the state. County costs to maintain rural roads damaged by riders and repair of highway shoulders were specific areas of concern. Both seasonal recreation and timberland owner participants expressed a perceived lack of enforcement effectiveness. Some timberland owners reported having to phone local authorities in response to OHV infractions because they were not comfortable confronting riders on their own. Others suggested that the number of enforcement officers should be increased to meet the increase in motorized recreation. Most focus group participants thought that punishment levels were not severe enough to discourage irresponsible behavior. These concerns and identification of specific management actions were incorporated in the survey instrument (Appendix A).

Survey Findings

Landowner management actions measured in the survey are in response to or in anticipation of negative impacts from OHVs, but also to perceived positive benefits. Impacts may result from personal use, permissible public use, use by friends and associates, or by those gaining access without permission. Of landowners surveyed, 27% indicate that OHVs are accessing their property without permission and an additional 22% are uncertain whether they are or not. The likelihood of access without permission was most often thought to originate from neighboring private lands (3.34 on a scale of 1-5, 5 being “very likely” and 1 being “very unlikely”). Access from neighboring public lands (1.94) and designated OHV trails (1.90) was thought to be much less likely. Also, timberland owners reported a higher percentage of unauthorized access than seasonal recreation landowners.

In terms of the types of management actions taken either to respond to OHV impacts or to discourage access, a variety of actions were assessed (Table 9). Posting signs and erecting physical barriers were the two most frequent actions taken by both timberland and seasonal recreation landowners. Overall, seasonal recreation landowners tended to take fewer actions than timberland owners, and actions to encourage responsible behavior like selling or leasing property, charging fees, having riders sign liability waivers, and providing trash bins were the least likely to be tried by either. They were also among the least considered.

Perceptions of the effectiveness of management actions may also influence landowners’ willingness to consider using them. On a scale of 1 to 5, 5 being “effective” and 1 being “ineffective,” respondents were asked to rate the effectiveness of specific management actions. The results were statistically similar for timberland and seasonal recreation landowners. Landowners perceived erecting of barriers, gates or fencing as the most effective technique to manage OHV use followed by posting signs (Table 9). Proactive actions such as constructing

Table 9. Percent of landowners who have taken or are considering actions for managing use of OHVs on their property, 2007¹

Landowner Management Actions	----- Timberland -----		----- Seasonal Rec -----		Asymp. Sig. (2-sided)	Perceived effectiveness ²
	Have taken action	Considering action	Have taken action	Considering action		
Erecting barriers	15.6 (137)	9.2 (81)	5.3 (47)	6.9 (60)	0.001	3.7
Erecting gates or fencing	8.3 (73)	5.1 (45)	2.0 (18)	5.0 (44)	0.000	3.5
Posting signs	17.2 (151)	7.2 (63)	5.0 (44)	7.4 (65)	0.000	3.4
Construct designated trails	1.6 (14)	3.6 (32)	0.5 (4)	3.2 (28)	0.010	3.2
Personal contact with riders	6.4 (56)	3.4 (30)	2.5 (22)	3.6 (32)	0.005	3.2
Directing riders to authorized routes	5.8 (51)	8.6 (76)	2.7 (24)	7.4 (65)	0.059	3.2
Reporting unauthorized activities	8.3 (73)	7.1 (62)	3.2 (28)	6.5 (57)	0.002	3.1
Linking trails	1.7 (15)	3.6 (32)	0.5 (4)	4.0 (35)	0.019	3.1
Constructing driveway approaches	2.0 (18)	3.2 (28)	1.0 (9)	3.1 (27)	0.238	2.9
Maintaining vegetation cover	4.4 (39)	3.1 (27)	1.6 (14)	3.1 (27)	0.017	2.9
Providing trash bins	0.8 (7)	3.6 (32)	0.3 (3)	3.0 (26)	0.498	2.9
Using guard animals	1.1 (10)	5.2 (46)	0.8 (7)	4.4 (39)	0.794	2.9
Selling portion of property	0.5 (4)	3.8 (33)	0.1 (1)	3.2 (28)	0.375	2.8
Leasing property	0.6 (5)	3.9 (34)	0.1 (1)	3.5 (31)	0.213	2.8
Seeking compensation for damages	0.7 (6)	4.0 (35)	0.0 (0)	3.1 (27)	0.074	2.7
Post contact information	3.8 (33)	4.0 (35)	1.0 (9)	3.0 (26)	0.034	2.7
Riders signing liability waivers	0.3 (3)	4.2 (37)	0.2 (2)	3.4 (30)	0.621	2.6
Charging fees to riders	0.2 (2)	3.5 (31)	0.1 (1)	2.8 (25)	0.590	2.5
Erecting self-pay system	0.2 (2)	3.9 (34)	0.1 (1)	3.1 (27)	0.595	2.3
Other management actions	1.0 (9)	1.6 (14)	0.1 (1)	1.8 (16)	0.026	2.8

¹ Number of respondents reported in parentheses.

² Perceived effectiveness of actions for managing OHV use.

designated trails also rated high along with directing riders to existing trails, and linking to existing trails. Making personal contact with riders or reporting illegal use to authorities was also perceived to be effective management techniques. Among landowners having taken action, the average number of days over the previous three years for planning, maintenance and repairs was approximately 4.5 days. The average amount of money spent over the same period by those taking action was less than \$100.

CONCLUSIONS

The key themes that emerged from the focus groups and survey questionnaire reveal a concern for OHV use on private property. But it was also revealed that OHVs provide an important tool for hunting, work, and recreational riding that will likely continue to increase. The challenge faced by many landowners in the eight-county study region, regardless of type and if they allow riding on their property or not, is in managing for the negative impacts caused by OHVs. County and state land managers are challenged in providing adequate places to ride OHVs safely, free from interfering with nonmotorized activities and from causing excessive environmental damage. As the popularity of OHV riding increases pressures on private lands will also likely increase along with conflicts among the various parties involved.

Based on the key issues to emerge from the focus groups, the survey questionnaire was organized by: (1) types of land uses, (2) benefits derived from OHVs, (3) negative impacts from OHV use, and (4) management actions taken in response. Our analysis focused on how these factors influence willingness to allow OHV access on private property for family and friends, and for the general public. The results indicate that 64% of landowners currently prohibit any type of OHV access. Of those who do allow access, 72% permit family and friends (26% of all landowners) but only 8% of the general public (3% of all landowners). When compared by type of landowner, timberland owners were more willing to allow OHV access than seasonal recreation landowners, particularly when speeds are below 10-mph, group size is less than four people, riders are older than 16-years of age, access is fewer than five times per year, and when noises are kept low.

Of particular concern among all landowners, whether they ride OHVs or not, were for the young age of riders, high speeds, loud noises, and riding on steep slopes, and through water-crossings and wetlands. This was also confirmed in the factor analysis that willingness to allow access to family and friends and as well to the general public significantly increased when these situations were avoided. Where the general public was concerned, seeking permission to ride on private property also factored highly as did riding along roadsides and away from buildings. Adherence to these constraints increased willingness to allow access to the general public to as high as 12% for timberland and seasonal recreation landowners, 17% when compared among landowners who ride OHVs, and 6% of non-OHV riding landowners. These are higher than the percentage of landowners who currently report to allowing public access and higher than found in previous studies, which indicates that the behaviors and characteristics of riders have an important influence on landowners' attitudes towards OHV access.

In terms of negative impacts caused by OHVs, landowners were most concerned about damage caused to soils, wetlands, and vegetation. They were also concerned about interference to

wildlife and hunting, particularly among OHV riders and timberland owners. Other factors such as vandalism, the spread of invasive weeds, roadside damage and interference with other motorized and nonmotorized recreation were also key concerns but not consistently among landowner types. Interestingly, when asked about the location of impacts, a majority of respondents had not personally experienced them on their own land. This was consistent with the focus group findings and reveals that most impacts landowners are concerned about were either not observed at all, were experienced by neighbors, or were more common on public lands. It also suggests that perceptions of impacts and riding behaviors are driving landowners' attitudes toward OHV riders and concerns for their property. Of those impacts most commonly experienced, littering, wildlife and hunting disturbance, damage to driveways, and to soils and vegetation were the most prevalent. Spread of invasive weed, threats to personal safety, interference with personal OHV riding, and damage to crops were among the least observed.

Last, we identified landowner management actions taken in response to OHV impacts or to benefit from OHV access. Of landowners surveyed, 27% indicate that OHVs are accessing their property without permission, most of which are thought to be coming from neighboring private lands as opposed to public lands or designated trails. Timberland owners also reported a higher percentage of unauthorized access than seasonal recreation landowners. The most frequent actions taken in response were to post signs or erected physical barriers. These were also perceived to be the most effective techniques. Actions to encourage responsible behavior like selling or leasing property for OHV use, charging fees, having riders sign liability waivers, and providing trash bins were the least used and were also considered to be among the least effective. Among landowners having taken action, the average number of days over the previous three years for planning, maintenance and related repairs was approximately 4.5 days. The average amount of money spent over the same period was less than \$100.

Private landowners fit prominently into OHV management in Minnesota with private lands comprising more than 75% of all land in the state (MN DNR 2008). Any trail system of reasonable size will likely border private lands and may seek to utilize them as key connectors between adjacent public lands. The results of this study identifies both the types of situations where landowners might be willing to grant access, and also the types of concerns landowners have regarding the use of their property, location of impacts, and types of impacts caused by OHVs. These findings are critical to the designation of state and local trails and for officials in the eight-county region who are responsible for road maintenance and repair, enforcement, and general natural resource management.

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Private Landowner Survey of OHV Access and Use



Greetings,

The University of Minnesota, in cooperation with the Central Minnesota Sustainable Development Partnership, is interested in understanding the use and perceptions of off-highway vehicles (OHVs) on your land. The information we get from this survey will enhance the management of OHV trails and improve knowledge about access on private property.

You have been selected to complete this survey because you own property classified for tax purposes as timberland within an eight-county region of central Minnesota. Timberland is defined as land used exclusively for growing trees for timber, lumber, and wood and wood products. Please consider this property when completing the survey. We have selected a small number of people to share their views and therefore, every questionnaire is important.

This survey should take just 15 minutes to complete. Please return the survey in the enclosed, self-addressed, postage-paid envelope within two weeks of receipt. All the information you provide is completely voluntary, confidential, and anonymous. Once our mailing procedures are complete, your name will be removed.

If you have any questions or concerns about the survey, please feel free to contact me at 612.624.7286 or email me at drbecker@umn.edu. Thank you in advance for your participation in this important project.

Sincerely,

Dennis R. Becker, Ph.D.
Project leader

Picture courtesy of ATVSource.com

Section I. Landowner and Property Profile

You have been selected to complete this survey because you own land within an eight-county region of Minnesota classified as timberland for tax purposes. Timberland is defined as land used exclusively for growing trees for timber, lumber, and wood and wood products. Please consider your timberland property in the counties listed below when completing the survey.

1. **Identify the counties in which you currently own property classified for tax purposes as timberland. For those counties where you own timberland, indicate the total number of acres. Please check all that apply and write in the acres in the space provided**

Minnesota County	Total Acres
<input type="checkbox"/> Becker	_____ acres
<input type="checkbox"/> Cass	_____ acres
<input type="checkbox"/> Crow Wing	_____ acres
<input type="checkbox"/> Hubbard	_____ acres
<input type="checkbox"/> Morrison	_____ acres
<input type="checkbox"/> Otter Tail	_____ acres
<input type="checkbox"/> Todd	_____ acres
<input type="checkbox"/> Wadena	_____ acres
<input type="checkbox"/> Other MN county	_____ acres
please specify: _____	

2. **How many months of the year do you live on any of these timberland properties or on adjacent property? Please check one of the following**

Less than 1 month 1-3 months 4-6 months Over 6 months

3. **How long have you owned your oldest parcel of timberland property? Write in the number of years**

_____ Years

4. **Indicate the frequency that you, your friends, your family, or others knowingly use your timberland property for the following purposes. Please circle the number that best describes frequency of use**

Property use	Never	Rarely	Sometimes	Often	Very often
Riding all-terrain vehicles (ATVs) for recreation	1	2	3	4	5
Riding off-road vehicles (ORVs) for recreation such as 4x4 trucks or Jeeps	1	2	3	4	5
Riding off-highway motorcycles (OHMs) for recreation	1	2	3	4	5
Riding snowmobiles for recreation	1	2	3	4	5
Bird watching	1	2	3	4	5
Hiking	1	2	3	4	5
Camping	1	2	3	4	5
Biking	1	2	3	4	5
Photography	1	2	3	4	5
Hunting	1	2	3	4	5
Fishing	1	2	3	4	5
Timber production for income	1	2	3	4	5
Agricultural production for income	1	2	3	4	5
Gathering berries, mushrooms, and other foods or non-timber products	1	2	3	4	5
Solitude and escape	1	2	3	4	5
Access to other resources in the area (e.g., lakes, rivers, public land)	1	2	3	4	5

Section II. OHV Access and Use

For the purposes of this survey, we are interested in the use and perceptions of the use of off-highway vehicles (OHVs) on your private property. OHVs include all-terrain vehicles (ATVs), off-highway motorcycles (OHMs) and off-road vehicles (ORVs), such as 4x4 trucks or Jeeps.

5. Do you ride OHVs? Please check one of the following

- Yes (Please go on to question 6)
- No (Please skip ahead to question 8)

6. How OFTEN do you use OHVs on the following types of land? Please indicate the frequency for each location

Property Type	Never	Rarely	Sometimes	Often	Very often	Not Applicable
Your own property	1	2	3	4	5	NA
Friend or family's property	1	2	3	4	5	NA
Public property in county	1	2	3	4	5	NA
Roadways, driveways, shoulders, or ditches	1	2	3	4	5	NA
Designated OHV park or trail	1	2	3	4	5	NA

7. Please identify the approximate percent of time you use your OHV for the following activities. Response should total 100%

OHV Competition _____% Work _____% Fishing _____%
 Recreational riding _____% Hunting _____% Other _____%

8. Do you allow others to ride OHVs on your timberland property? Please check one of the following

- Yes (Please go on to question 9)
- No (Please skip ahead to question 10)

9. Identify who else rides OHVs on your timberland property. Please check all that apply

Your children Spouse Children's friends Neighbors
 Your grandchildren Other relatives Co-owner(s) of property General public
 Parents Your friends Others _____

10. Are OHVs being ridden on your timberland property without your permission? Please check one of the following

- Yes (Please go on to question 11)
- No (Please skip ahead to question 12)
- Do not know

11. This question has two parts: First, indicate the likelihood of sources of OHVs accessing your property without permission. Second, indicate the distance of each likely source for OHVs to access your property. Please circle the number corresponding to likelihood, and circle the number of miles from each land type

Land Type	Likely source of OHVs on your property					Distance from property		
	Very Unlikely	Unlikely	Neither	Likely	Very Likely	Less than 1 mile	1-5 miles	Over 5 miles
State forest or park	1	2	3	4	5	< 1	1-5	5+
County forest or park	1	2	3	4	5	< 1	1-5	5+
Federal land	1	2	3	4	5	< 1	1-5	5+
OHV trail or riding park	1	2	3	4	5	< 1	1-5	5+
Other private property	1	2	3	4	5	< 1	1-5	5+

12. Indicate your willingness to allow OHV riding on your timberland property by FRIENDS or FAMILY MEMBERS (immediate or extended) in the following circumstances. Please circle the number that corresponds with your level of willingness for each circumstance

Circumstance	Completely unwilling	Slightly unwilling	Neither	Slightly willing	Completely willing
Speed of rider(s)					
Less than 10 mph	1	2	3	4	5
10 – 20 mph	1	2	3	4	5
More than 20 mph	1	2	3	4	5
Number of rider(s) in group					
1 rider	1	2	3	4	5
2-3 riders	1	2	3	4	5
4 or more riders	1	2	3	4	5
Age of rider(s)					
Less than 12 years of age	1	2	3	4	5
12-15 years of age	1	2	3	4	5
16-25 years of age	1	2	3	4	5
Older than 25 years of age	1	2	3	4	5
Frequency of riding					
Less than 5 times per year	1	2	3	4	5
5-10 times per year	1	2	3	4	5
More than 10 times per year	1	2	3	4	5
Location of riding					
Woodlands	1	2	3	4	5
Prairies	1	2	3	4	5
Water crossing or wetland	1	2	3	4	5
Steep inclines	1	2	3	4	5
Driveway or other roads	1	2	3	4	5
OHV recreational trail	1	2	3	4	5
Size of area used for riding					
Less than one-half square mile	1	2	3	4	5
One-half mile to one square mile	1	2	3	4	5
More than one square mile	1	2	3	4	5
Proximity of rider(s) to buildings					
Less than 0.25 miles	1	2	3	4	5
0.25 miles to one-half mile	1	2	3	4	5
More than one-half mile	1	2	3	4	5
Time of year of riding					
Winter	1	2	3	4	5
Spring	1	2	3	4	5
Summer	1	2	3	4	5
Fall	1	2	3	4	5
During hunting season	1	2	3	4	5
Noise level created by rider(s)					
Low	1	2	3	4	5
Moderate	1	2	3	4	5
High	1	2	3	4	5
Rider(s) sign liability waiver	1	2	3	4	5
Rider(s) ask for permission	1	2	3	4	5

13. Indicate your willingness to allow OHV riding on your timberland property by the GENERAL PUBLIC in the following circumstances. Please circle the number that corresponds with your acceptance for each circumstance

Circumstance	Completely unwilling	Slightly unwilling	Neither	Slightly willing	Completely willing
Speed of rider(s)					
Less than 10 mph	1	2	3	4	5
10 – 20 mph	1	2	3	4	5
More than 20 mph	1	2	3	4	5
Number of rider(s) in group					
1 rider	1	2	3	4	5
2-3 riders	1	2	3	4	5
4 or more riders	1	2	3	4	5
Age of rider(s)					
Less than 12 years of age	1	2	3	4	5
12-15 years of age	1	2	3	4	5
16-25 years of age	1	2	3	4	5
Older than 25 years of age	1	2	3	4	5
Frequency of riding					
Less than 5 times per year	1	2	3	4	5
5-10 times per year	1	2	3	4	5
More than 10 times per year	1	2	3	4	5
Location of riding					
Woodlands	1	2	3	4	5
Prairies	1	2	3	4	5
Water crossing or wetland	1	2	3	4	5
Steep inclines	1	2	3	4	5
Driveway or other roads	1	2	3	4	5
OHV recreational trail	1	2	3	4	5
Size of area used for riding					
Less than one-half square mile	1	2	3	4	5
One-half mile to one square mile	1	2	3	4	5
More than one square mile	1	2	3	4	5
Proximity of rider(s) to buildings					
Less than 0.25 miles	1	2	3	4	5
0.25 miles to one-half mile	1	2	3	4	5
More than one-half mile	1	2	3	4	5
Time of year of riding					
Winter	1	2	3	4	5
Spring	1	2	3	4	5
Summer	1	2	3	4	5
Fall	1	2	3	4	5
During hunting season	1	2	3	4	5
Noise level created by rider(s)					
Low	1	2	3	4	5
Moderate	1	2	3	4	5
High	1	2	3	4	5
Rider(s) sign liability waiver	1	2	3	4	5
Rider(s) ask for permission	1	2	3	4	5

Section III. OHV Benefits and Impacts on Private Property

14. Indicate the importance of each of the following benefits for anyone using OHVs on your timberland property.

Please circle the number corresponding with the level of importance for each benefit

Type of Benefit	Very unimportant	Somewhat unimportant	Neither	Somewhat important	Very important	Not applicable
	1	2	3	4	5	NA
Increased productivity or efficiency of work tasks	1	2	3	4	5	NA
Efficient mode of transportation	1	2	3	4	5	NA
Increased contact with neighbors	1	2	3	4	5	NA
Increased contact with friends	1	2	3	4	5	NA
Provides a safe place for family or friends to ride	1	2	3	4	5	NA
Provides income from fees collected from others riding on your property	1	2	3	4	5	NA
Provides income from fees collected for use of a constructed "challenge course"	1	2	3	4	5	NA
Local economic gain from increased rider traffic	1	2	3	4	5	NA
Access for physically handicapped or challenged	1	2	3	4	5	NA
Hunting assistance (carry gear, game)	1	2	3	4	5	NA

15. This question has two parts: First, indicate the degree to which you are concerned with the following types of OHV impacts on YOUR property. Second, identify impacts you have PERSONALLY observed by property type. Please circle the number that describes your level of concern and where you have observed impacts

Type of Impact	<u>Concern</u>				<u>Impacts Observed</u>			
	Not concerned	Mildly concerned	Moderately concerned	Very concerned	My property	Other private	Public land	Not observed
	1	2	3	4	Mine	Other	Public	NO
Ground damage (e.g., rutting)	1	2	3	4				
Soil erosion	1	2	3	4	M	O	P	N
Vegetative damage	1	2	3	4	M	O	P	N
Timber damage	1	2	3	4	M	O	P	N
Noise	1	2	3	4	M	O	P	N
Vandalism	1	2	3	4	M	O	P	N
Driveway approach damage	1	2	3	4	M	O	P	N
Road or pavement damage	1	2	3	4	M	O	P	N
Wetland damage	1	2	3	4	M	O	P	N
Interference of non-motorized recreation	1	2	3	4	M	O	P	N
Wildlife disturbance	1	2	3	4	M	O	P	N
Hunting interference or interruption	1	2	3	4	M	O	P	N
Crop damage	1	2	3	4	M	O	P	N
Structural damage (e.g. gates, fencing)	1	2	3	4	M	O	P	N
Litter	1	2	3	4	M	O	P	N
Interference with own OHV riding	1	2	3	4	M	O	P	N
Threats to personal safety	1	2	3	4	M	O	P	N
Liability issues	1	2	3	4	M	O	P	N
Spread of invasive plants (e.g., knapweed)	1	2	3	4	M	O	P	N

Section IV. Private Landowner Management of OHV Use

16. This question has two parts: First, indicate the degree to which you perceive the following actions to be effective for managing use of OHVs on private property. Second, indicate if you personally have taken or are considering each action. Rate the effectiveness each action, and circle actions taken or considering

Action	Perceived Effectiveness					Personally	
	Ineffective	Mildly ineffective	Neither	Mildly effective	Effective	I have taken this action	I am considering taking this action
Posting signs restricting OHV access	1	2	3	4	5	Taken	Considering
Placing signs to direct riders to authorized route through property	1	2	3	4	5	T	C
Erecting barriers to prevent access	1	2	3	4	5	T	C
Using guard animal(s) to prevent access	1	2	3	4	5	T	C
Reporting unauthorized activity to local law enforcement authorities	1	2	3	4	5	T	C
Erecting gates or fencing allowing access to designated areas	1	2	3	4	5	T	C
Linking trail system through property	1	2	3	4	5	T	C
Leasing portion of property for OHV use	1	2	3	4	5	T	C
Selling portion of property for OHV use	1	2	3	4	5	T	C
Erecting self-pay station	1	2	3	4	5	T	C
Charging riders a fee to use property	1	2	3	4	5	T	C
Asking riders to sign a liability waiver	1	2	3	4	5	T	C
Personal contact with rider(s)	1	2	3	4	5	T	C
Posting contact information	1	2	3	4	5	T	C
Constructing designated trails	1	2	3	4	5	T	C
Constructing driveway approaches	1	2	3	4	5	T	C
Providing trash bins for garbage	1	2	3	4	5	T	C
Maintaining vegetation cover to discourage OHV use in certain areas	1	2	3	4	5	T	C
Seeking compensation or assistance for damage caused by OHVs	1	2	3	4	5	T	C
Other (please specify): _____	1	2	3	4	5	T	C

17. Indicate the total number of DAYS you have spent managing for OHV use and impacts on your property over the past THREE YEARS including planning efforts, maintenance, and repairs. Please indicate total days

___ Total days

18. Indicate the total amount of MONEY spent managing for OHV use and impacts on your property over the past THREE YEARS including planning efforts, maintenance, and repairs. Please indicate total dollars spent

- ___ \$0
- ___ \$1-\$100
- ___ \$101-\$500
- ___ \$501-\$1,000
- ___ \$1,001-\$5,000
- ___ More than \$5,000

Section V. Additional Demographic Information

19. What year were you born? *Write in year*

19____

20. What is your gender? *Check one*

____ Male ____ Female

21. What is the highest level of education you have completed? *Circle one*

Eighth grade	High school/ GED	Tech school	Some college	College degree	Advanced degree
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22. In what ethnicity and race would you place yourself?

Ethnicity *Check one:*

____ Hispanic or Latino ____ Not Hispanic or Latino

Race *Check all that apply:*

____ American Indian or Alaska Native ____ Asian
____ Black or African American ____ Pacific Islander
____ White ____ Other

23. What is your employment status? *Check one*

____ Employed full time ____ Employed part time ____ Retired ____ Other

24. What is your annual household income (before taxes)? *Check one*

____ less than \$5,000 ____ \$5,000-9,999 ____ \$10,000-14,999
____ \$15,000-24,999 ____ \$25,000-34,999 ____ \$35,000-49,999
____ \$50,000-74,999 ____ \$75,000-99,999 ____ \$100,000 -124,999
____ \$125,000-149,999 ____ \$150,000-174,999 ____ \$175,000 or more

Other Comments:

THANK YOU FOR YOUR PARTICIPATION!