

USE AND USER PATTERNS AMONG MICHIGAN LICENSED OFF-HIGHWAY VEHICLES OWNERSHIP TYPES

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Abstract: Conventional off-highway vehicles (OHVs) range from small personal vehicles, such as motorcycles and all terrain vehicles to full-size passenger vehicles such as four-wheel drive trucks. The market and general recreational use of OHVs has changed markedly over the past thirty years. While many studies of OHV enthusiasts generalize to all OHV types, little research has drawn distinctions among different vehicle ownership segments. Consequently, in a 1998-99 study, Michigan OHV licensees were classified into seven ownership segments and differences among group members assessed. This research is presented and management implications of non-homogeneous users outlined.

Introduction

As in many other states, off-highway vehicles (OHVs) in Michigan are defined as any wheeled motor vehicle capable of off-road travel (Michigan P.A. 319, 1975). This includes small lightweight single person vehicles, such as off-road motorcycles and three and four wheel all terrain vehicles (ATVs) and full-size four-wheel drive passenger vehicles such as trucks, jeeps, sport utility vehicles, and others specialty vehicles like dune buggies (hereafter characterized as SUVs). Snowmobiles are not considered OHVs in Michigan.

The recreational use of these OHVs can be divided into two broad categories pertaining to the basic function of the vehicle (Sheridan, 1979). In one category, the OHV, particularly motorcycles and specialty SUVs, such as dune buggies, is used primarily for recreational trail and scramble area riding. In the other category, mainly ATVs and SUVs such as four-wheel drive trucks, the vehicle is primarily for transportation supporting non-trail recreation and utilitarian pursuits. These include the support of hunting, ice fishing and camping as well as hauling, mowing, and plowing.

Management Issues

Beginning with modified street motorcycles in the 1920s and converted military vehicles following World War II, OHVs grew in popularity during the 1960s and early 1970s (Hope, 1972). With their popularity came a number of

social and ecological consequences including concerns about noise, trespass and privacy and the amount and impact of soil erosion on surface waters and aquatic life (USDI, 1971; Sheridan, 1979). To contend with these circumstances, numerous states enacted legislation regulating and controlling OHV use, which subsequently led to the creation of OHV programs featuring users paying to develop and maintain trails and scramble opportunities (Belknap, 1988).

However, with the advent of the ATV in the mid-1970s, the OHV situation changed dramatically complicating management. The ATV was a versatile personal vehicle capable of traversing a greater variety of terrain than motorcycles and trucks, that could also transport a person and hundreds of pounds of gear into remote, non-roaded areas. With a treadway width of 50 inches needed for ATVs, many of the developed, designated trails designed for motorcycles in the 1960s and 70s, were too narrow with their 24-inch treadways. By the late 1980s, the ATV had emerged in Michigan as the most widely owned and used OHV (Nelson, 1989; Nelson, 1996). Today, the range of OHVs challenge managers by presenting a wide variety of vehicle widths and serving a myriad of purposes for their operators. Often these operators cross back and forth from public lands and frozen waters to private lands for a variety of recreational and work pursuits. ATVs, especially in areas with little sustained, deep snow cover, are operated year round.

The situation is further compounded because many OHV enthusiasts are complex with each having different motivations, attitudes, and interests depending on the type(s) of OHVs they own and operate (Peine, 1973). For instance, those who own motorcycles may be exclusively interested in designated public trail opportunities, whereas those who only own ATVs may be more interested in riding county road shoulders and cross country travel to reach preferred deer hunting locations. Others may own a variety of OHVs for both trail riding and utilitarian purposes.

Effective management necessitates a more complete understanding of the characteristics, needs and desires of different OHV segments. While many past studies generalized to the OHV user population, some have explored differences between various segments OHV segments. For example, Propst et al. (1977) compared users of motorcycles and four-wheel drive vehicles, identifying differences related to uses of the OHV. More recently, Crimmins (1999) in a 1998 mail survey of Colorado OHV users, found those who used their OHV for hunting or were members of an OHV club differed on opinions about funding priorities from OHV enthusiasts as a whole. While these studies are telling, no comparisons were found in the literature among the full range of OHV ownership segments. Consequently, in a 1998-99 mail study, Michigan OHV licensees were classified into seven ownership segments and differences among group members and management implications were assessed (Nelson et. al., 2000).

Study Background

Michigan's first OHV regulations were promulgated in 1976 with the passage of Michigan Public Act 319 of 1975, commonly referred to as the 'Off-Road Vehicle (ORV) Law.' Since then, the OHV program, administered by the Michigan Department of Natural Resources Forest Management Division (DNR-FMD) has continued to evolve (Nelson, 1996). Today, regulations restrict non-street licensed OHVs to designated trails and areas posted "open to OHVs" on the approximately 3 million acres of state and national forests in the Lower Peninsula. In the Upper Peninsula OHVs may use on any forest road or trail unless posted closed. Non-street licensed OHVs are banned from all but one of the 100 Michigan state parks and all of the state game and wildlife areas (Nelson, 1996). Private lands, with landowner permission, are open to OHV use throughout the state. Regulations also require the licensing of all resident and non-resident OHVs to operate on any public lands or frozen waters. Revenues from licensing are used for trail development, maintenance, law enforcement, environmental damage restoration, safety education and administration. In FY1999 these totaled about \$2 million. Presently, Michigan's designated OHV trail system totals 3,107 miles, with 40% maintained as 40 inch wide motorcycle trail, 43% as 50 inch wide ATV trail (open to cycle and ATV use) and 17% as 96 inch wide or wider OHV route (open to cycles, ATVs and SUVs) (Nelson, 1999). In addition, there are six major designated scramble areas, with the largest 2,500 acres.

Study Methods

The data for this study was gathered using a mail questionnaire with a sample of Michigan 1998-99 OHV licensees (Nelson et al., 2000). The DNR License Control Division reported that in June 1999 there were 124,731 OHV licenses from the 1998-99 license year (April 1998 – March 1999). Of these, approximately 71,000 were in an electronic licensing system and another 2,500 were in the Michigan Cycle Conservation Club electronic database. The approximately 120 OHV dealers not in the electronic licensing system had sold the other 50,000 licenses. These dealers are not required to maintain records of purchaser names and addresses. Yet, based on input from DNR License Control, the Michigan Cycle Conservation Club Executive Director, and the State OHV Coordinator, it was determined that the electronic system list, in combination with the Cycle Conservation Club list, was likely to be representative of the total OHV licensee population.

To select a representative sample of OHV licensees, all duplicate names (cases where a person had more than one licensed OHV) were removed from both lists. Hence a person with one or five OHVs had the same chance of being sampled. This resulted in a total of 50,904 different OHV licensees from the 71,000 licenses in the electronic system that had one or more Michigan licensed OHVs in 1998-99. A similar procedure was used with the Cycle Conservation Club list resulting in 1,651 persons who had one or more Michigan licensed OHVs in 1998-99. From these two combined lists a systematic sample of every 10th OHV licensee was selected with a random start. Excluding

incomplete addresses, this resulted in a sample of 5,008 individuals.

The mail questionnaire was designed in cooperation with the DNR OHV Trail Coordinator and was reviewed by the Michigan OHV Trail Advisory Committee and the Michigan State University Committee on Research Involving Human Subjects. The 4-page questionnaire had 31 questions and elicited information on OHV ownership use, fuel consumption, spending, management preferences and demographics.

Multiple mailings of the questionnaire were used to encourage response. The initial mailing, sent in mid July 1999, included a questionnaire, explanatory cover letter and business reply envelope. The second mailing sent in early August 1999, used a follow-up reminder postcard. Finally, non-respondents were sent a third mailing of the questionnaire, revised cover letter and business reply envelope in late September 1999. Certified mail was used for the final mailing to emphasize the importance of the survey and to insure the address was correct for the licensee. Data was entered and analyzed using Statistical Package for the Social Sciences (SPSS).

Results

Of the 5,008 addresses, 312 (6.2%) were invalid. Of the 4,696 valid addresses, 2,405 (51.2%) responded by returning a questionnaire. Of those, 115 (4.8%) no longer owned or used OHVs in Michigan. The remaining 2,290 completed the questionnaire and their responses are used in the analysis.

Segmentation of OHV Licensees and OHV Use

Michigan OHV licensees were classified into seven ownership segments: motorcycle only, ATV only, SUV only, cycle/ATV, ATV/SUV, cycle/SUV, and cycle/ATV/SUV (Table 1). Altogether, ATV only licensees comprise over half of the OHV licensees, while ownership of all three OHV types accounted for the smallest percentage (3%) of license holders. Other segments with more than 10% of the licenses are motorcycle only and ATV/SUV. The motorcycle only and motorcycle/SUV segments were most likely to use the designated trail and route system, while ATV only segments were least likely to use them. Likewise, the motorcycle/SUV segment was most likely to report using at least one of the six designated scramble areas during July 1998 – June 1999, while ATV only respondents were least likely to visit these areas.

Less than a third of the OHV use in Michigan by licensed OHVs was public land riding (including the designated trail/area system) during a 12-month period in 1998-99 (Table 2). Motorcycles were most focused on public land riding, while half of ATV use was on private lands and more than a quarter was on public or private lands solely to support hunting or ice fishing. SUV riding was more common on public land than private, but over a third of the use was to support hunting or ice fishing on public or private lands.

Table 1. OHV Ownership and Use of Designated Trails/Areas by 1998-99 Michigan OHV Licensees

Ownership type	Percentage		
	Licensee households	Use designated trail system	Use designated scramble areas
Motorcycle only	12.5	87.7	45.0
ATV only	53.0	39.7	16.1
SUV only	7.9	65.9	51.4
ATV/SUV	13.4	47.5	29.5
Motorcycle/ATV	6.9	78.6	51.9
Motorcycle/SUV	3.2	86.1	59.7
Motorcycle/ATV/SUV	3.0	73.5	54.4
Total or average (a)	100.0	54.0	29.1

(a) Total for licensee households, means for other columns.

Table 2. Michigan OHV Use July 1998 - June 1999 for 1998-99 Michigan OHV Licensees

Vehicle type	Percentage			Total
	Public land riding	Private land riding	Hunting/ice fishing	
Motorcycle	58.8	38.4	2.8	100.0
ATV	21.1	50.0	28.9	100.0
SUV	41.4	24.2	34.4	100.0
All OHVs	30.6	43.9	25.5	100.0

OHV Program Management

Motorcycle only segment members were likely to be more positive in their ratings of the Michigan OHV program and have knowledge of specific program aspects than other segments (Tables 3 and 4). Conversely, the ATV only segment was least knowledgeable of OHV program aspects. Those ATV only segment members that had some knowledge of OHV program aspects rated performance lower, except in the cases of law enforcement and safety education.

OHV Licensee Demographics

The motorcycle only segment had the lowest mean age of all segments (Table 5). On average, motorcycle only licensees were 9 years younger than the ATV only segment, which had the highest average age. The motorcycle only segment also had the highest proportion of males, members with some college education and membership in OHV related organizations. By contrast, ATV only segment had the smallest percentage of members with some college education or membership in one or more OHV related organization. Median income levels were highest for the motorcycle/SUV segment. All segments had

household median income ranges higher than the median for Michigan's population.

Average household size was likely to be smallest for the motorcycle only segment and largest for licensees with all types of OHVs (Table 6). The proportion of household members who operated an OHV was also likely to be smallest for motorcycle only and largest for households with all types of OHVs. The ownership segment where household adults were most likely to have completed an OHV safety class was ATV/SUV and for household children it was the segment that owned all types of OHVs. In no ownership segment had more than one third of those 17 years old and under who actually operate the household's OHVs completed an OHV safety class.

The OHV riding history of households with motorcycles differs markedly from those without (Table 7). In motorcycle oriented segments, the mean age for first riding an OHV was less than 16 years old. Conversely, the ATV only segment, the average age for first OHV ride was almost 31. For every segment except ATV only, the first type of OHV ridden was most likely to be a motorcycle. Motorcycle related segments have much higher percentages of participation in competitive events than other segments.

Table 3. Rating of Selected Aspects of Michigan OHV Program by Ownership Type for 1998-99 Michigan OHV Licensees (a)

Ownership type	Regulations		Law Enforcement		Safety Education		Trail Maintenance	
	Mean rating	Percent no knowledge	Mean rating	Percent no knowledge	Mean rating	Percent no knowledge	Mean rating	Percent no knowledge
Motorcycle only	3.38	9.6	3.34	18.1	3.34	45.9	3.37	10.3
ATV only	2.92	21.3	3.23	38.8	3.51	46.2	2.95	51.1
SUV only	3.36	18.6	3.00	24.3	3.25	45.8	3.22	26.6
ATV/SUV	2.86	10.9	3.11	24.5	3.49	39.4	2.93	40.4
Motorcycle/ATV	2.97	10.9	3.29	21.2	3.46	35.3	3.16	17.9
Motorcycle/SUV	3.26	5.6	3.29	12.5	3.66	34.7	3.39	4.2
Motorcycle/ATV/SUV	2.94	8.8	2.90	13.2	3.30	36.8	2.82	17.6

(a) Rating scale: 5 = very good; 4 = good; 3 = OK; 2 = poor; 1 = very poor.

Table 4. Rating of Selected Aspects of Michigan OHV Program by Ownership Type for 1998-99 Michigan OHV Licensees (a)

Ownership type	Trail Design		Parking Areas		Trail Maps	
	Mean rating	Percent no knowledge	Mean rating	Percent no knowledge	Mean rating	Percent no knowledge
Motorcycle only	3.81	13.2	3.95	15.3	3.65	14.2
ATV only	3.20	54.0	3.36	61.0	3.23	54.5
SUV only	3.24	28.2	3.31	41.8	3.00	37.9
ATV/SUV	3.14	41.1	3.39	51.0	3.16	44.0
Motorcycle/ATV	3.67	23.7	3.65	27.6	3.41	23.1
Motorcycle/SUV	3.54	4.2	3.72	6.9	3.56	5.6
Motorcycle/ATV/SUV	3.02	19.1	3.75	26.5	3.11	19.6

(a) Rating scale: 5 = very good; 4 = good; 3 = OK; 2 = poor; 1 = very poor.

Table 5. Selected Characteristics of 1998-99 Michigan OHV Licensees by Ownership Type

Ownership type	Mean	Percent			Median
	Age	Male	With ≥ 1 year of college education	Member of ≥ 1 OHV organization	1998 Household Income
Motorcycle only	38.4	98.2	62.6	59.3	\$40,000-\$59,999
ATV only	47.3	93.6	41.8	17.7	\$40,000-\$59,999
SUV only	39.4	90.2	54.7	26.6	\$40,000-\$59,999
ATV/SUV	43.8	94.9	51.4	27.5	\$40,000-\$59,999
Motorcycle/ATV	38.6	90.9	52.6	44.9	\$40,000-\$59,999
Motorcycle/SUV	34.3	97.1	61.1	58.3	\$60,000-\$79,999
Motorcycle/ATV/SUV	38.9	90.9	51.5	52.9	\$40,000-\$59,999

Table 6. Selected Characteristics of 1998-99 Michigan OHV Licensees by Ownership Type

Ownership type	Adults ≥ 18 years old			Children ≤ 17 years old		
	Mean	Percent		Mean	Percent	
	Number	Operated OHV	Completed safety class	Number	Operated OHV	Completed safety class
Motorcycle only	1.91	64.3	8.2	0.84	52.9	16.0
ATV only	2.03	74.6	18.5	0.61	47.0	14.4
SUV only	2.10	70.7	8.2	0.67	18.3	0.9
ATV/SUV	2.10	80.4	22.2	0.63	46.4	12.0
Motorcycle/ATV	2.13	81.6	15.0	1.13	72.9	13.5
Motorcycle/SUV	2.03	76.3	8.6	0.65	68.2	18.2
Motorcycle/ATV/SUV	2.42	90.6	19.4	1.03	83.8	23.5

Table 7. OHV Riding History by OHV Ownership Type for 1998-99 Michigan OHV Licensees

Ownership type	Mean	Percent			
	Age first rode OHV	First rode cycle	First rode ATV	First rode SUV	Rode in competitive event (a)
Motorcycle only	15.1	91.6	7.0	1.4	31.9
ATV only	30.8	33.9	61.2	4.0	2.6
SUV only	20.7	45.4	10.9	43.6	7.7
ATV/SUV	23.4	45.6	37.1	17.3	3.4
Motorcycle/ATV	15.2	76.5	18.3	5.3	21.7
Motorcycle/SUV	13.0	84.3	10.0	5.7	40.0
Motorcycle/ATV/SUV	13.8	75.0	17.6	7.4	32.4

(a) Sanctioned event occurred in past 5 years

Region of residence in Michigan is dramatically different by segment (Table 8). The SUV only and all segments with motorcycles are concentrated in more urban southern Lower Michigan. By contrast, members of ATV oriented segments are much more likely to live in the more rural, forested northern two thirds of the state.

Motorcycle oriented segments generally have the highest levels of participation in non-motorized activities,

particularly those that are physically intense such as mountain biking and cross-country skiing (Table 9). Segments containing ATV only, ATV/SUV, and those owning all vehicle types are most likely to participate in ice fishing and deer hunting. Snowmobiling is most popular with segments owning multiple types of OHVs. The ATV only segment is least likely to participate in any of the selected activities with the exception of ice fishing and deer hunting.

Table 8. Region of Residence of 1998-99 Michigan OHV Licensees from Michigan by OHV Ownership Type

Ownership type	Percent		
	Upper peninsula	Northern lower peninsula	Southern lower peninsula
Motorcycle only	4.2	18.3	77.5
ATV only	26.6	23.0	50.4
SUV only	8.4	16.9	74.7
ATV/SUV	29.4	19.7	50.9
Motorcycle/ATV	10.3	15.9	73.8
Motorcycle/SUV	3.0	18.2	78.8
Motorcycle/ATV/SUV	17.9	19.4	62.7

Table 9. Participation in Outdoor Recreation Activity Types during 7/98 – 6/99 by OHV Ownership Type for 1998-99 Michigan OHV Licensees

Ownership type	Percent participating		
	Snowmobiling	Non-motorized activities (a)	Hunting and fishing
Motorcycle only	31.4	38.9	32.1
ATV only	26.7	21.6	72.0
SUV only	29.9	29.9	58.2
ATV/SUV	40.1	34.3	80.1
Motorcycle/ATV	46.2	31.4	59.6
Motorcycle/SUV	52.8	45.8	45.2
Motorcycle/ATV/SUV	63.2	32.4	76.5

(a) Non-motorized activities includes backpacking, cross country skiing, mounting biking, and hiking.

Management Implications

ATV Only Segment of Licensees

The largest segment of OHV licensee holders is ATV only licensees. They comprise 53% of all OHV licensees. Furthermore, nearly half of them reside in the northern 2/3 of the state where only 15% of the state's population resides. A majority (60%) of this group does not make any use of the designated OHV trail/area system all of which is in the northern 2/3 of the state. Rather, over three fourths of the reported ATV use is on private property, including work around the home, second home, farm or vacant land property and in direct support deer hunting or ice fishing. Consequently, many in this segment appear disconnected from the OHV program that appears focused on designated trails/areas. When asked what should be changed about the current Michigan OHV program two of the three most common suggestions from ATV only members were to allow riding on road shoulders like snowmobiles and to reduce OHV license fees for those using the vehicles for hunting or fishing.

The Michigan DNR has done relatively little to communicate the benefits of the OHV program to non-trail oriented OHV users. First, they have invested over \$500,000 of OHV license dollars since the mid-1990s to restore OHV caused environmental damage. Much of this restoration directly improves fish and wildlife habitat. These grants often go to non-profits focused on fish and wildlife related pursuits such as Trout Unlimited. Considering that hunting and fishing are primary concerns of the ATV only segment, this would be an important positive message to this segment. It may also spur new partnerships among fish and wildlife related organizations to be grant recipients of future restoration funds. Furthermore, a properly designed and designated trail system should safeguard fish and wildlife habitat from impairment by those seeking trail riding experiences, which will also benefit ATV only licensee interests. Finally, OHV license monies finance OHV law enforcement. This in turn further protects fish and wildlife habitat.

However, recent DNR policy decisions restricting deer feeding and baiting to stop the spread of bovine

tuberculosis may present a further policy twist, as many purchased their ATVs specifically to support deer hunting activities. With almost two thirds of the ATV only segment involved in deer hunting, resentment concerning limitations on feeding and baiting may limit opportunities for communication and cooperation with the DNR.

Another issue for this group concerns age and personal mobility. The average age of ATV only licensees is 47, with over 21% 60 or more. Collectively, segment members also started riding OHVs during adulthood, rather than during adolescence like motorcycle oriented segments. This suggests that mobility impairments often related to age, such as arthritis and heart diseases may make ATVs more attractive for many to access outdoor recreational settings they formerly used without motorized assistance. This may bring about challenges related to the Americans with Disabilities Act concerning reasonable accommodation in the recreational use of public non-wilderness lands such as the state and national forests.

Motorcycle Oriented Segments of Licensees

Motorcycle only households, when compared to ATV only licensees, are much different. Overall, they were younger averaging 38 years old verses 47 years old for ATV only licensees. Moreover, they were much more likely to have started riding OHVs, especially motorcycles, as teenagers. They also tend to be better educated and be more active in other physically intense outdoor activities than non-motorcycle segments. As a whole, those who owned one or more motorcycles appear more satisfied with the current OHV program. The majority of their use (63%) is oriented to the designated trail/scramble system, which requires extensive travel of two or more hours with a tow vehicle for most to reach from southern Lower Michigan. They were more likely to be knowledgeable of and satisfied with the performance of OHV program managers than other segments. Of all the OHV segments, they also appear the most politically enfranchised, as over half are members of an OHV related organization. The two largest OHV organizations in Michigan, the Cycle Conservation Club and the American Motorcyclist Association, also directly represent motorcyclists by name.

Other segments that contain a motorcycle also seem to be more like motorcycle only segments than non-motorcycle segments. This includes early initiation of OHV use, higher use of the designated trail system and residing in the more urbanized southern Lower Peninsula of Michigan. This creates a challenge for broadening the scope of Michigan's OHV program to be more inclusive of ATVs. Currently all the designated trail system can be used by the motorcycle only segment, while only 60% is wide enough for use by ATVs and only 17% is wide enough for SUV use. To maintain highly technical trails, especially the type that appeal to those who ride in competitive motorcycle events, narrow (40 inches as handle bar height and 24 inches on the ground) trails are vital. Since the majority of grant money for trail maintenance and development also flows through non-profit motorcycle oriented groups, there is little incentive for change.

SUV Oriented Segments of Licensees

The SUV oriented segments, while relatively small, are strongly focused on the designated scramble area system. Operators seek places to test their vehicles and compete in such tests against other riders. Scramble areas that contain hill climbs and large areas of rolling, sandy terrain are especially attractive. The three most heavily visited scramble areas for such activities are part of a sand dune oriented state park near Lake Michigan and two areas of more than a thousand acres in the central portion of the northern Lower Peninsula, one on state forest land and one on national forest land. Development of additional scramble areas is controversial, as law enforcement, safety and environmental problems are daunting. All attempts to develop additional public facilities for this activity in southern Lower Michigan, even in abandoned industrial sites such as gravel pits, have met with strong opposition and have been stopped.

Because of their street licensed status, this segment can use the forest road system to support activities such as deer hunting and dispersed camping. However, most of the off-road trail system is inaccessible. Widening existing ATV or motorcycle trails to accommodate these larger vehicles would present significant safety risks and environmental challenges. The 17% of the trail system with 96-inch wide trail that accommodates these vehicles is also discontinuous, generally being comprised of sections of forest roads designated as OHV trail so loops of the cycle and ATV trail system can be connected. Street licensed vehicles not possessing an ORV license can also legally use this 96-inch wide trail. Hence, like the ATV only segment, SUV oriented segments have little use of the total trail system and no exclusive use areas.

Conclusion

The complexity of OHV management is steadily increasing in Michigan as the range of OHV options expands and as competition for designated trail/area space increases within the OHV community and beyond with other land uses. This segmentation of OHV ownership types provides insight into these complexities and suggests future challenges.

Principally it suggests that treating OHVs as a single class of vehicles whose operators have similar interests may be ill advised and that managers need to become more sophisticated in their approach to OHV use and users.

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