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A CASE STUDY EVALUATION ON THE
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IN MICHIGAN

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PHYLLIS ANNE DORMAN

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Joseph D. Fridgen
Major professor

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A CASE STUDY EVALUATION ON THE
HURON-MANISTEE NATIONAL FORESTS
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BY

Phyllis Anne Dorman

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ABSTRACT

NONCOMPLIANCE WITH OFF-ROAD VEHICLE REGULATIONS: A CASE STUDY EVALUATION ON THE HURON-MANISTEE NATIONAL FORESTS IN MICHIGAN

By

Phyllis Anne Dorman

This study assesses ORV users knowledge and awareness of ORV regulations. The success of an education program developed to make users aware of ORV regulations is evaluated. Guidelines for increasing the effectiveness of future education programs are discussed.

Data was collected during the summer of 1980 on the White Cloud District of the Huron-Manistee National Forest in Michigan. Characteristics and opinions of summer off-road vehicle users were obtained through on-site personal interviews. Interviewing occurred on three trail sites, a motorcycle enduro and three camping areas.

Results of the data indicated the majority of the riders were aware regulations exist, but could not recall any specific information about the regulations. Inadequate use of mass media channels limited the effectiveness of the education program in reaching the intended audience. Guidelines for improving the dissemination and the content of future education programs are discussed.

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INTRODUCTION

Increasing ORV Regulation in Michigan

Regulations have been enacted to minimize the impact of recreational sports on the land and minimize the conflict between peoples. The increasing regulation of off-road vehicles (ORV's) is an example of this.

In 1976, one out of eight Michigan households owned an off-road recreation vehicle (ORV) and an estimated 3,338,000 Michiganders participated in dispersed ORV recreation on National Forest land (Michigan DNR, 1976). Although ORV recreation does not rank high in comparison to other popular recreation activities in Michigan,¹ the controversy over ORV use on public lands has resulted in increased regulation of the sport.

In 1975 and 1976, Michigan passed laws providing for the registration, regulation and facility development for the use of ORV's. At the same time, the state defined the conditions under which an ORV may be operated (Michigan, 1975). But the State was not alone in increasing ORV regulation. In 1976, the United State Forest Service (FS) developed guidelines and ORV regulations for the Huron-Manistee National Forest (H-M). The present plan is a temporary one and permits ORV use on all FS roads (5000 miles of low standard roads), confines ORV trail use to designated trails (629 miles), and permits cross country use of ORV's only in designated areas. This ORV order was

drafted to help minimize conflicts with other users, to protect the forest resources and to provide for the safety and welfare of all users (H-M ORV Plan, 1976b).

It is one thing to initiate policy and another for it to be effective. The characteristics of ORV users inherently make management difficult. When users are involved in dispersed recreation, such as ORV users, they tend to be thinly scattered over a broad land base, highly mobile, and constantly in flux (James, 1971). This mobility and flux typical of ORV users, not only makes it difficult to inventory actual use in National Forests (McCurdy, 1970), but it makes it difficult to communicate new policy and guidelines to the users. In spite of the recent laws and due to enforcement difficulty, Forest Service officials on the H-M maintain that there is an ORV problem as ORV riders are not complying with the established regulations.

Problem Statement

ORV use is concentrated on the White Cloud District of the H-M because of its closeness to urban areas. The District Ranger reports illegal ORV use occurs frequently and indiscriminately. Riders return to areas closed for ORV use and use the areas despite closure signs or physical barriers. Cross-country travel by ORV riders is also illegal and continues to take place.

This study explores ORV use, legal and illegal, on the White Cloud District, to develop guidelines which can be used to reduce illegal use

¹ Other recreation activities include 44 activities ranging from competitive sports, swimming, and dining out to attending Bingo or similar events. ORV activities ranks only two categories above the latter in terms the frequency of response (Michigan DNR, 1976).

through an Information and Education (I & E) program. To date, the District Ranger on the White Cloud District has indicated that an I & E plan developed on the H-M has not been able to change illegal ORV use patterns and appears to have been unable to inform ORV riders of the regulations. These statements need to be verified and the reasons for failure determined.

This is the problem from the manager's perspective. But is there a problem from the ORV recreationists' point of view? Satisfactions gained from the present ORV areas and user knowledge of ORV regulations may have a strong impact on whether or not ORV recreationists comply with regulations. The problem of non-compliance must also be explored from the recreationists' perspective.

Objectives

The objectives of this study are: 1) to assess ORV users knowledge and awareness of ORV regulations on the White Cloud District; 2) to determine the success of the I & E plan and the reasons for success or failure; 3) to establish possible reasons for noncompliance; and 4) to develop guidelines and techniques for increasing the effectiveness of future I & E programs.

To accomplish the above objectives, the following questions must be addressed. 1) Are the majority of ORV riders on the White Cloud District knowledgeable of ORV rules and regulations? 2) What factors (age, clubmembership, or type of riding) are related to knowledge of regulations? 3) Do ORV riders perceive or notice rule violations on the part of other ORV riders? 4) What are the best methods for disseminating information to ORV riders on the District?

Definitions

The following is a list of definitions used by the researcher. These definitions are given to clarify the author's meaning in using these terms throughout the manuscript.

Attitudes - inclinations or feelings we hold toward various people, products or services, and places.

Depreciative behavior - knowingly disobeying the ORV rules established by the Huron-Manistee National Forests.

Developed campground - sites built for camping by a public or private organization providing marked parking, water and toilet facilities. They are maintained by the respective organization and fees are charged at most of them.

Dispersed campground - a camping area not built or maintained by a public or private agency which is located on public land and does not have developed facilities (i.e. well water, parking lots) built on it, yet it is used as a primitive campsite by enough recreationists that the area shows physical signs of camping activity.

Dispersed site - (as used in this study) an area where the Forest Service has not developed facilities for recreation use, but through observation, it is established that a particular recreation activity occurs on the site with relative frequency.

Enduro - an organized competitive event for dirt bikes where riders follow marked trails through rough terrain over routes ranging from 80 to 400 miles long. It is a race in which the rider must keep to a time schedule, usually averaging 24 miles per hour, and the driver is penalized for arriving at checkpoints ahead or behind the scheduled time.

Illegal ORV site - an area on the Huron-Manistee National Forests other than Forest Service roads and designated ORV trails where ORV activity is known to occur even though the area is not marked as a legal ORV site.

Legal ORV site - on the White Cloud District it includes an area where ORV use is permitted according to the National Forest ORV closure order: all Forest Service roads and designated ORV trails and areas.

Legal ORV trail - an existing one-track pathway capable of travel by a two-wheel or three-wheel vehicle less than 40 inches in width that is marked open for ORV use.

ORV (off-road vehicle) - a motor-driver vehicle capable of cross-country travel without benefit of a road or trail, on or immediately over land, marsh, swampland or other natural terrain.

ORV Registration fee - a fee paid to the state to purchase a special ORV license which legitimizes a vehicle for ORV use.

ORV user - the driver of an ORV.

Two-track forest road - a gravel or dirt pathway, fire lane, abandoned railroad right-of-way, logging road, or a way capable of travel by a four-wheel vehicle, except an interstate, state, or county highway.

LITERATURE REVIEW

Visitors may expect something entirely different than the manager is thinking of and the sooner he finds out about it the better. In other words, identification of key attractions or attraction areas can help managers focus on their decision information needs sooner (Chilman, 1978, p.82).

Is There an ORV Problem?

Roland Emetaz (1978), a Forest Service researcher, says perhaps the ORV problem is all in the manager's mind. He typifies the FS manager as having an educational background in the natural sciences, thus a biological education background, a natural resource orientation and a lack of understanding of ORV users. Emetaz suggests that this means FS managers have more empathy for the resources than for the ORV user. His solutions to the "ORV problem" include identifying ORV opportunities and providing them, managing the sites to mitigate wear and tear caused by heavy use and rehabilitating damage as soon as possible. He suggests education, self-regulation, enforcement and restriction of ORV users as techniques to control the situation and says closure should only be used as a last resort.

ORV Problems

The H-M land managers designed the ORV order to minimize the ORV problems and conflicts with other users. Yet H-M land managers estimate

that because of the restrictions the order places on riders, the Forests "do not, and cannot, meet the full desires of either motorized or non-motorized forest users, but (can) hopefully gain the understanding and support of both groups. We recognize the user demand for a quality experience exceeds the supply of facilities for certain ORV users..." (U.S.D.A. Forest Service, 1976b). Literally, this means that many users would have to ignore the Forest Service order and use areas indiscriminately in search of a premier ORV experience.

One district on the H-M, the White Cloud District, receives heavy concentrations of ORV use due to it's accessibility to urban areas. This study identifies what type of ORV areas recreationists prefer and determines whether the ORV users are satisfied with the use areas offered on the White Cloud District of the Huron-Manistee National Forests. An inventory by Forest Service managers of concentrated summer ORV use in 1979 indicates the majority of ORV use on the Forest is occurring in violation of the order. To counteract this, a two-stage plan was initiated to manage the ORV problem. During the summer of 1979, an Information and Education (I & E) program was developed and implemented. It was to be followed in 1980 with intensive law enforcement. The Information and Education program was developed in the supervisors' office of the Huron-Manistee National Forests and was to be implemented on each district (U.S.D.A. Forest Service, 1979). Its main objective was to obtain public acceptance and compliance with the H-M ORV Order.

The methods used included:

- 1) Developing & installing posters to make the public aware of regulations.

- 2) Publishing a brochure containing the regulations and helpful hints.
- 3) Arranging feature stories with the media.
- 4) Writing press releases, and distributing them to all media outlets. (These may or may not be printed as determined by the editor of the media contacted).
- 5) Buying advertising space for ORV regulation ads.
- 6) Contacting influential individuals & organizations.
- 7) Reserving booths at local fairs to disseminate ORV material as well as other Forest information.
- 8) Cooperating and supplementing the Michigan DNR education program.
- 9) Enforcing the regulations uniformly.

Things that were considered, but not implemented on a forest-wide basis, included spot radio announcements for distribution to local and metropolitan stations and developing a radio broadcasting system on the Forest. The success of the plan was determined by whether or not the above items were accomplished.

During the summer of 1979 and the spring of 1980, the White Cloud District completed the tasks listed in item 1, 2, 3, 4, and 6, as assigned by the supervisors office.

- 1) Posters were placed on Forest Service bulletin boards in campgrounds, at Cedar Creek Cycle trail, and at seven dispersed ORV areas at obvious points of entrance.
- 2) Brochures were given out by law enforcement officers and campground hosts when they met ORV users.

- 3) Stories were featured in newspapers and local radio stations. This provided some news coverage.
- 4) News releases appeared in: the Big Rapids Pioneer; the Newaygo Sun; the Freemont Times Independence; the Ann Arbor News; the Flint Journal; the Muskegon Chronical; and the Saginaw Press.
- 6) Contacts with ORV club members were primarily directed towards discussion of priorities on trail construction.

Several activities were omitted. Booths were not reserved at local fairs. Although not eliminated, law enforcement was restricted because of lack of funding. Television ads were not developed or purchased.

The overall I & E Plan appeared to be a good plan in its conception. However, the success of the plan is not known and will be evaluated. One simple measure is the number of people who can identify at least some general part of a regulation.

The I & E plan was to be followed in 1980 with intensive law enforcement. Unfortunately due to budgetary and mileage constraints the second stage (concentrated enforcement) has been virtually eliminated.

The above delineates the problem in the past. Yet H-M land managers feel there may be more problems in the future. Projected growth for participation in various recreation activities on the H-M NF indicates an approximate annual growth rate of 2% for all activities including ORV use (U.S.D.A. Forest Service, 1976a). Questions H-M managers are asking about the future include:

Will we reach the people we need to... (with the I & E plan) and is the conflict we talk about real?

Would more trails designed to meet users expectations reduce law enforcement problems?

Do we know what kind of trails the user wants?

Is education enough?

Should we try to enforce the regulations with only limited personnel and equipment capabilities? (Chandler, 1980)

For the present, the Huron-Manistee National Forests is trying a combination of management techniques including education, enforcement, restoration and some closure by barriers of illegal ORV use areas. This closely follows Emetaz's (1978) suggestions mentioned previously. Emetaz's comments deal only with FS managers. After recognizing that there may be some biases in natural resources land managers' attitudes towards ORV use, one must evaluate how the general public perceives ORV users. It is because of public opinion and resource damage that present policies have been developed.

A FS study (Banzhaf, George & Company, 1974) on ORV use interviewed a random sample of Michigan and Wisconsin residents. The study concluded:

- 1) That the volume of response was great enough to assure public input.
- 2) There was consensus on most major issues cutting across possible biases resulting from occupation, income and even ORV experience.
- 3) The three main points of general public consensus were:
 - a) The majority of the general public approves of ORV use.
 - b) The Forest Service should exercise control over trails and routes to increase safety and reduce dangers in ORV use.
 - c) ORV use should be prohibited during hunting season.

In Michigan the DNR conducted a telephone survey of a random

sample of 17,781 Michigan residents. Residents were asked if they had any opinions regarding use of ORV's. Twenty-nine percent of the heads of households responded negatively, 6% positively and 52% had no opinion. The DNR concluded that the negative opinion was weighted towards the non-ORV owner segment of the population because of the numbers of households interviewed which were not ORV owners. DNR officials also indicated that because of the large percentage of respondents who had no opinion, prospects for improving the public perception of ORV use appears to be good (Michigan DNR, 1977).

ORV Control Or Lack Thereof?

Would increasing enforcement be effective as a solution to the ORV problem? On the White Cloud District increasing enforcement to stop ORV users' violations of regulations is temporarily impossible because of increasing gas and oil costs which has resulted in a decreased operating budget not to mention outright mileage restrictions. Regardless of these constraints, research suggests enforcement is not the total answer. Although few ORV studies have been directed towards enforcement problems, several observations can be made from related studies.

In a study on undesirable behavior in forest campgrounds, Clark, Hendee, and Campbell (1971) suggest that rules intended to control certain types of behavior must be analyzed as to their effects on recreational activities before they are implemented. "If the public cannot see their worth and the underlying rationale, then these rules will most likely be violated" (Clark, et al., 1971, p. 12). The authors also indicated rule violations in campgrounds were often the result of

sheer disregard of known regulations when the regulations interfered with desired goals.

At present, violators of the Michigan Law are guilty of a misdemeanor punishable by a fine of not more than \$100 and/or 90 days imprisonment. Violators of the Forest Service ORV order on Federal land are subject to a maximum fine of \$500 or 6 months imprisonment, or both. This threat of punishment for failure to comply with the order can be viewed as minimal. Users of ORV's are highly mobile and are able to travel over adverse terrain. Therefore, enforcement by chase is considered an exercise in futility by some (LeValley, 1978).

Aside from that, literature on threat-effectiveness analysis (Hovland, Irving, and Kelly, 1953) suggests it is ineffective. The literature suggests a threat appeal is most likely to induce an audience to accept the communicator's viewpoints if:

- 1) The emotional tension aroused during the communication is sufficiently intense to constitute a drive state, and
- 2) silent rehearsal of the recommended belief attitude is immediately followed by reduction of tension.

It could be suggested at this point that the present situation of enforcement on the H-M cannot produce these two conditions. The concern for fines or imprisonment is probably not enough to arouse intense emotional tension in ORV users and obeying the law at this point does not provide the emotional recreational experience the ORV user seeks. It could be argued that ORV users may gain more emotional reduction of tension by recreating where they please.

Model legislation for ORV regulation was developed in the early 1970's for the Great Lakes regional area (Upper Great Lakes Commission,

1972). These recommendations were closely incorporated into Michigan's ORV legislation. To aid enforcement the laws enacted by Michigan state that: an ORV operator must bring his vehicle to a stop, when requested by hand, voice, emergency light, siren or audible signal by a law enforcement officer; or when operated on the private premises of another and visibly hailed to stop by the owner or authorized agent. Persons who do not stop are guilty of a misdemeanor. In addition, the owner of an ORV as ascertained by the registration number will be held responsible for offenses committed with the vehicle (Michigan DNR, 1980). These regulations help, but in general both Michigan DNR and Forest Service enforcement officials say that their enforcement programs have not been effective in deterring illegal ORV use.

In other areas of the country, results of intensifying law enforcement in campground areas has proven to be effective in reducing vandalism and deviant behavior in urban-oriented forest recreation areas (Hronek 1968; McElwain & Hronek 1969; McElwain, 1970). Even so, McElwain (1970) reached the conclusion at the end of a three year analysis that "soft sell" and prevention contacts by an officer play an important role in deterring undesired actions. The role of information and education (I & E) is stressed repeatedly as possibly the only solution to the ORV problem. Bury and Fillmore (1974) suggest unacceptable behavior by riders could be minimized or decreased by easy access to publications explaining rules and regulations, and locations of riding areas and trails.

LeValley (1978) recommends that education when used as a law enforcement tool can effectively increase registrations, awareness of safety, respect for other users, and the environment, and result in

voluntary compliance. LeValley also stresses that apprehension and arrest is only a solution for the minority of users and the educational approach is most effective for the majority of users.

But a driver's education program for young ORV riders initiated in Michigan by the state has not received much support. Only 500 students went through the course in 1980 (Dabb, 1981). The Michigan DNR hopes to publicize the program more in the future, but it's effectiveness since its creation in 1976 has been limited.

Overall ORV strategies for effectively preventing and controlling ORV rule violations have not been substantiated yet. Christensen and Clark (1978), in analysing depreciative acts in forest recreation areas, suggested that several strategies be combined since no one strategy has been found to control and prevent vandalism in recreation areas. They suggest the following methods are often used to try and control depreciative acts: education; specialized design of sites and facilities; maintainance; fees; detection and enforcement; and public involvement. Their research concludes education is rarely effective alone and suggests three steps to be accomplished to make educational programs more effective. 1) The manager must understand the motives and desires of users. 2) Managers should understand their own motives. 3) Messages about regulations should include a rationale for them.

As mentioned, the White Cloud District does use a combination of the methods mentioned above at varying levels with the exception of fees which can not be charged because of Forest Service regulations. The present combination according to the District Ranger have not been effective. This study however revolves around the belief that the results of this evaluation will suggest a combination of communication

strategies that can be implemented and that they will be effective in controlling non-compliance of ORV regulations by users.

If education is recognized as having the most potential to help solve the ORV problem then more effective methods of communication must be discovered. Ross & Moeller (1974) studied methods of communicating rules in recreation areas. They recommend that the uninformed segments of the recreational audience be identified first and then the most effective method for conveying rules to that audience be determined. This survey is designed to determine what segment of the ORV population is informed of the rules and which is not, and will attempt to define suitable communication methods for reaching the ORV user on the H-M. When deriving conclusions from this study it will be best to keep in mind the following:

"Because recreationists are free to ignore most of the communications directed towards them by land managers, the effectiveness of conveying this information often depends on how much motivation and interest can be generated" (Wagar, 1971, p.165).

Advertising research has investigated how to motivate and generate interest in products. Ray (1973) indicates that there are three key decisions to make before advertising: 1) develop goals measured by a response; 2) determine two parts of a message strategy - the appeal (what to say), and the format (how to say it); and 3) determine the message distribution through repetition, exposure, and media channels. When Clark, et al. (1971) studies suggest that the underlying rationale of regulations should be explained to the ORV user, in advertising terms this rationale should be in a format that appeals to the audience.

There are many basic communication principles that could enter into structuring advertising appeal and format. Berelson and Steiner (1965) discuss communication theory in relation to human behavior. Examples of the principles discussed in Berelson and Steiner(1965) include:

"A) People tend to see and hear communications favorable or congenial to their predispositions; they are more likely to see or hear congenial communications than neutral or hostile ones. And the more interested they are in the subjects, the more likely is such selective attention (pp.529)."

"B) The higher a person's level of intelligence, the more likely it is that he acquires information from communications (pp.544)."

"C) The communication of facts is typically ineffective in changing opinions in desired directions against the force of audience predispositions. The stronger the predispositions, the less effective the communication of facts (pp.548)."

"D) Anticipating a subsequent use increases retention of even uncongenial information (pp.550)."

"E) Strong appeals to fear, by arousing too much tension in the audience, are less effective in persuasion than minimal appeals (pp.552)."

However, communication principles should probably be used only as guidelines in absence of, or to supplement, data directly relevant to a particular problem.

The ORV User

The following section reviews the current literature available on the socio-economic characteristics of ORV users around the country, as well as studies which indicate the time activities take place. This information will be helpful in determining the methodology of this study.

The majority of motorcycle ORV users are under 30, as indicated by state, regional and national studies (Motorcycle Industry Council, 1978; Bury and Fillmore, 1974; Robertson and Bishop, 1975; and Michigan DNR, 1977). Huron-Manistee land managers estimate 80% of their ORV use results from motorcycle and trail bike recreationists. Therefore it would be logical to assume that the average H-M ORV user is in his mid-to late-20's.

Bury and Fillmore (1974) found that 42% of the ORV riders drove under 50 miles to reach the site; 31% drove between 50 and 299 miles, and 28% drove over 300 miles to reach the site. However the Bury and Fillmore study reports user trends on a highly popular recreation area with a well-publicized ORV recreation area. A study by Robertson and Bishop (1975) did not include an estimate of local recreation by ORV users; but they suggest that 74% of the users lived in rural areas, small cities or towns.

The influence of large urban areas within a 200 mile radius of the White Cloud District may result in a different profile of ORV users. Therefore, an representative profile of ORV users on the District is developed through this study. In 1980, Forest Service recreation managers estimated their ORV use to be 50% local and 50% from other areas, but they agree the margin for error is wide.

The Motorcycle Industry Council (1978) estimated 93.8% of motorcycle owners are male and 6.2% female. This statistic is comparable by the ORV motorcycle users in Bury and Fillmore's (1974) study where 86.5% of the users were male and 13.5% were female. Due to the large percentage of motorcyclists among H-M ORV users, it is estimated the H-M users will be close to the above figures.

In preparing the sampling scheme for this study, the estimated time of activity participation for ORV users from other areas of the country has been helpful. Approximately 42% of ORV activities in Michigan occurs during weekends according to the small respondent sample obtained by the Michigan DNR (1977). Other studies have also indicated usage is distributed almost equally between weekend and weekdays (Bury and Fillmore, 1974; and Johnson, Meisenback, and Rawlings, 1974). However a study on 18 sites in the Allegheny National Forest indicated a much higher weekend use: 67% as opposed to 33% on weekdays, (U.S.D.A. Forest Service, 1978).

A California study found the average operating time was five hours per day for trailbikes, 3.2 hours for minibikes, and 6.6 hours for dune buggies. Members of the average respondent's household spent two weekends per month at a use area, with an average of 1.9 Saturdays and 2.1 Sundays. Most of these ORV users operated their machines with family and friends while considerably fewer operated alone or with organized clubs (Johnson, et al., 1974). The social aspect of ORV recreation is reflected in motivational research by Knopf (1972), where "being with others" was ranked as the most important consequence for ORV trail bikers.

Clark, Hendee, and Campbell (1971) classified observed depreciative acts into five apparent motivation categories. Their study indicated disregard and ignorance of regulations accounted for over 67% of the depreciative acts with convenience and entertainment following with 18% and 7%, respectively. Eight percent of the respondents indicated that the rules interfered with their desired goal.

Robertson and Bishop (1975) dealt with ORV user preferences in ORV recreation areas. Survey respondents were asked to specify the size of an ORV recreation area that would be necessary to induce them to take a day-long trip. Answers were requested in terms of either acres-of-ground or miles-of-trails at the option of the respondents. Almost half of the motorcyclists contacted preferred an ORV trail 20 to 50 miles in length. Over half of the 4-wheel drive respondents desired an area with 6 to 25 miles of trails. The size of the recreation area preferred by ORV users was helpful in delineating the sites to be selected for this study.

METHODS AND PROCEDURES

Introduction

The White Cloud District of the Huron-Manistee National Forests was selected as the district to be surveyed for the following reasons: 1) due to its close proximity to urban population centers it was recommended by the Recreation Staff Officer, Bob Lockhart (1980), as being a district which receives the heaviest concentration of ORV use both legal and illegal; 2) it is the closest district to Michigan State University and the researchers base of operations; 3) the study was supported by the District Ranger, Gordon Joiner(1980); and 4) Lockhart suggests that the White Cloud District roughly approximates the types of ORV use on the other districts (1980).

The White Cloud District is located in the southern portion of the Manistee National Forest (See Figure 1). The southern portion of the district is very close to Muskegon with the Cedar Creek Cycle trail only being a 20 minute drive from downtown Muskegon. Inside the district are numerous county and Forest Service roads. The District has excellent access via four lane expressways. The expressway network efficiently links the District with the major urban areas of Michigan as well as northern Illinois, Indiana, Ohio, Wisconsin, and the province of Ontario.

Gordon Joiner, the District Ranger, estimates that the total potential population of people likely to travel to this area is over 15

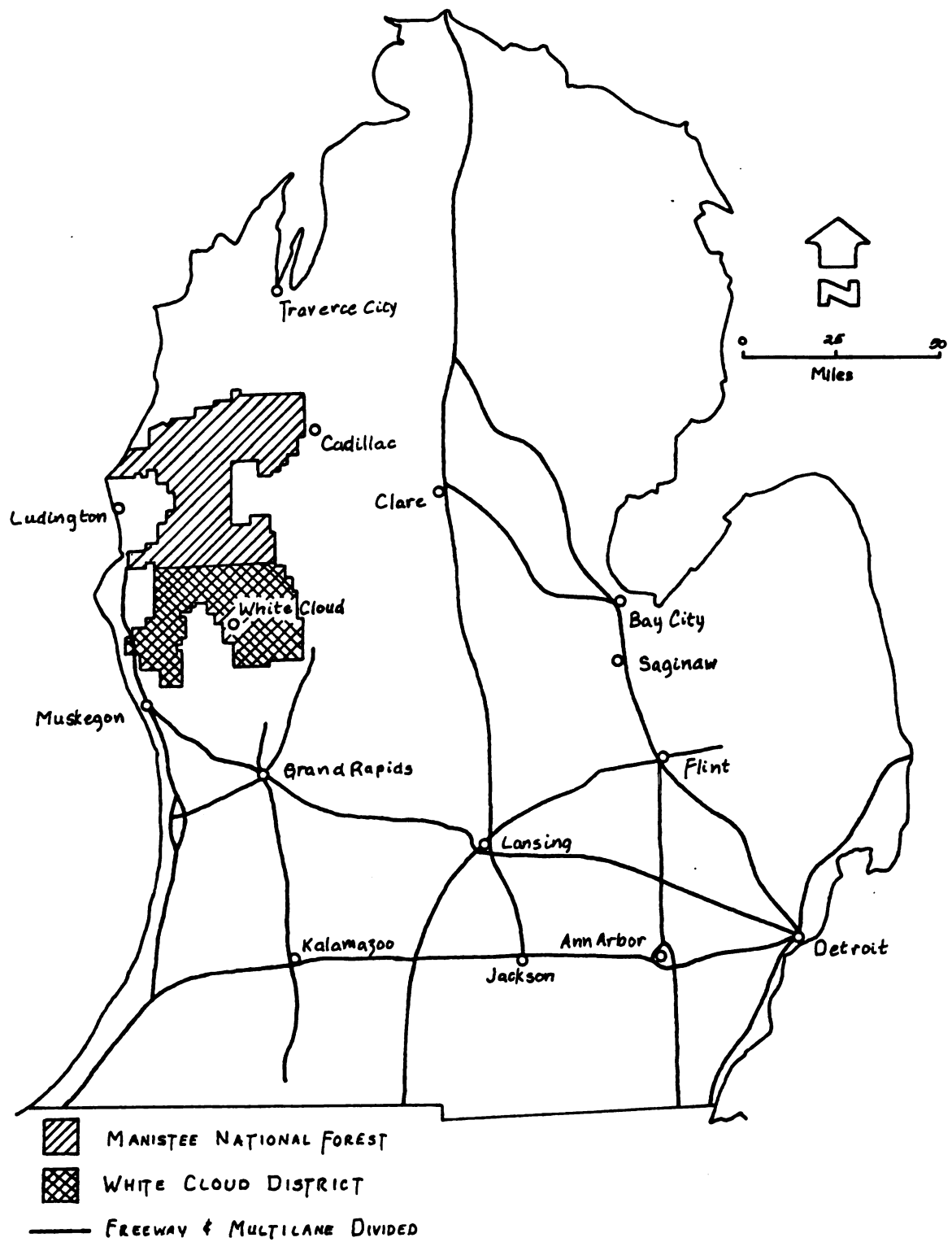


Figure 1. Location of the White Cloud District.

million. Most live within 300 miles (a 6-8 hour drive) of the District. As the energy situation becomes more critical, Joiner (1979) estimates that this district and other areas close to urban population centers will experience a dramatic increase in recreation demand.

Although there is a wealth of natural beauty in the area, the district has little that uniquely characterizes the area. As a result tourism accounts for only a small percentage of the total employment on the District.

The recreation potential of the area is enhanced by it's water resources. The District is drained by three primary water sheds, the Pere Marquette, the White River and the Muskegon River. The Pere Marquette and White Rivers provide excellent fishing and canoeing enthusiasts enjoy them also.

Recreation activity is year-round on this District. In the winter, cross-country skiing, snowmobiling, and winter sports are the predominant activities.

Spring through fall, traditional forest recreational activities occur. These includes camping, picnicking, fishing, canoeing, hunting, ORV driving and hiking. There are 25 organized camps (Boy Scouts, church, service clubs, etc.) operating within the District's boundary. There are several sportsman's gun clubs. Mushroom and berry pickers visit the District on a seasonal basis.

The District Ranger summarized the ORV impact by indicating it represents a major factor in the White Cloud's dispersed use. A significant number of campers also operate ORV's with motorcycles being number one by a wide majority, followed by four-wheel drive vehicles and dune buggies. The impact to the district is estimated at over

100,000 ORV user days per year. Resource damage from ORV's use over the district is wide spread. The District issues permits for three motorcycle enduro's during the year: the West Michigan Seaway Festival - 350 riders; the West Michigan Enduro Riders - 250 riders; and the Michigan Dirt Riders - 200 riders (Joiner, 1980).

Population

The primary ORV population on the District consists of motorcyclists. They can be broken down into two subgroups-trail and road riders, and enduro riders. It is estimated that the motorcyclists probably engage in other recreation activities (primarily camping) while on the National Forest.

With this in mind it was decided to sample three trail/road survey stations, one competitive enduro, and to sample ORV camping populations. The sample included one Forest Service developed campground and three dispersed camping sites.

Site Selection

The survey sites selected to collect ORV riders while they were recreating was based upon the evaluation of all ORV use sites, (legal and illegal) on the district by the District Ranger and the researcher. The White Cloud District has 80 miles of marked motorcycle trails; Cedar Creek Cycle trail constitutes 50 miles and the Michigan Cross Country Cycle trail runs for 30 miles on the district on a course from Newaygo to Baldwin. ORV riders may also ride legally on all two-track Forest Service roads passable by a 4-wheel drive, and any marked ORV

trails or sites. Single track trails not marked open and cross country riding is prohibited.

Since a primary purpose of this study was to determine the ORV users knowledge and awareness of regulations, a representative group of ORV users needed to be contacted. It was decided to select three sites which had the highest use figures or estimates. On this basis, two areas were selected where the legal motorcycle trails crossed Forest Service road so that there was a potential to sample 4-wheelers and dunebuggy drivers. Since the available use figures on illegal dispersed sites were low, only one illegal use site was included. Carlton Creek, an illegal site, had the largest dispersed use figure available, but it could not be included in the sampling because its location made it difficult to access. Thus the illegal dispersed site with the second highest use figures (North Branch) was chosen.

As mentioned, the ability to contact a representative sample of summer ORV users was the primary consideration in locating the sites. Other factors considered were: 1) choosing a site where the approaching vehicle would normally be slowing down; 2) placing signs far enough ahead so drivers were aware a survey was being conducted and; 3) choosing a spot where there was adequate pullover space, so as not to congest the area or initiate a serious safety hazard. Figure 2 illustrates the location of the 4 major sampling areas on the district.

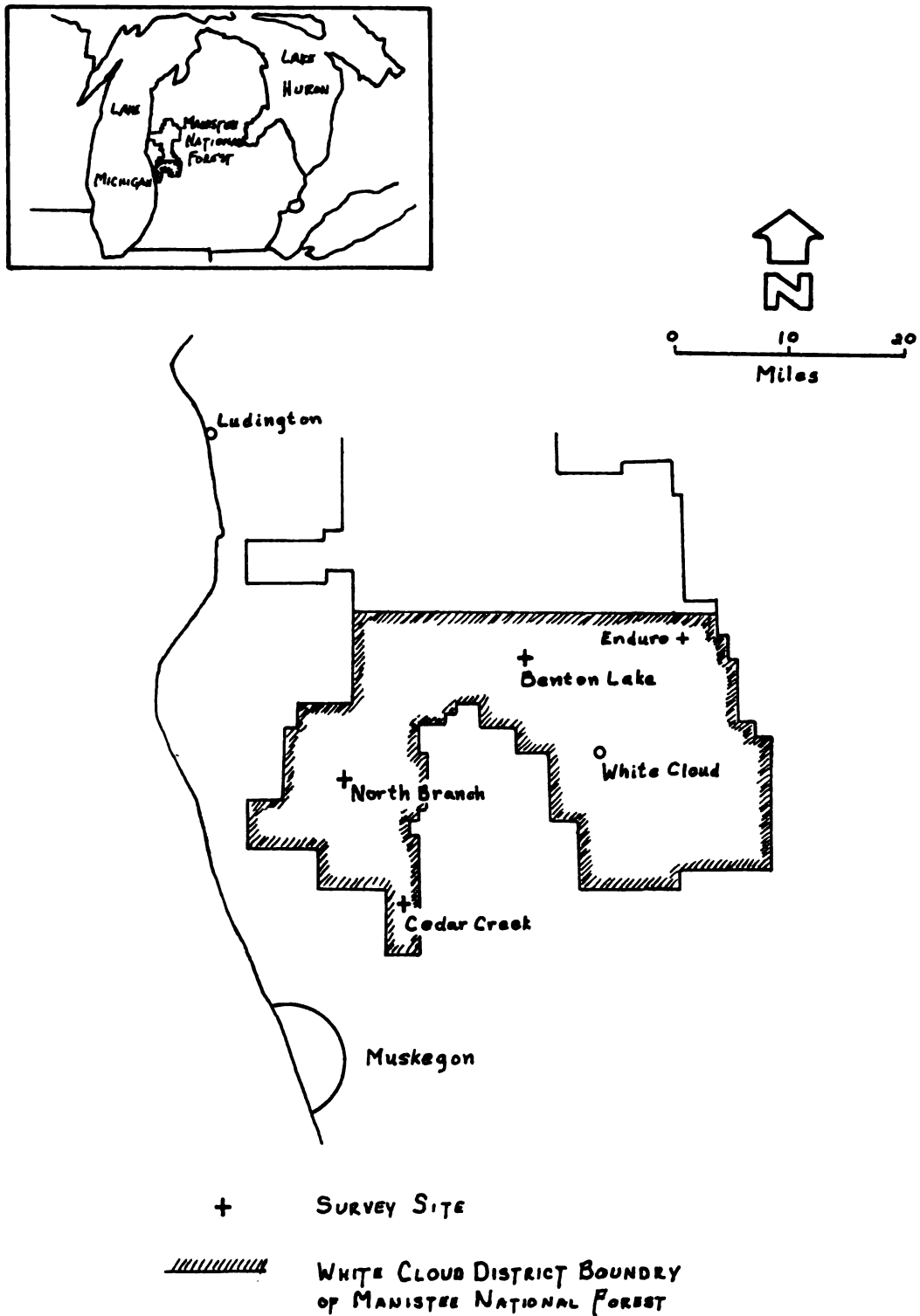


Figure 2. Location of the Survey Sites.

Site Description

Cedar Creek Cycle Trail (CCC) - The CCC trail is a loop trail 50 miles in length. The parking lot and staging area for setting up cycles located in SW 1/4, NW 1/4 of T11N, R15W on Muskegon County. There are numerous side roads crossing the trail enabling cyclists to lengthen or shorten the route as desired. The main access located off of Ryerson Road is Linderman Road, a county road. The survey station was established at a split in the 2-track road just west of the parking lot entrance, and north of the cycle trail crossing.

North Branch - A concentrated ORV use area where there is visible hill erosion caused by illegal use. An unnamed Forest Service road provides access into the area through a pine plantation and into small grass covered sand dune hills along the North Branch of the White River. The location is the NW 1/4 of Section 11, T13N, R16W.

The 2-track road funnels all traffic into the area. Therefore, the sampling spot was located at the first area close enough to the hill climbs that the researchers would be aware of ORV activity and yet still on the road at the point where ORV vehicles would feasibly start to disperse.

Benton Lake - The survey station was located at the junction of Forest Service Roads 5308 and Crosswell Avenue of a point where the Michigan Cross Country Cycle trail crosses this corner. It is a four way stop on a wide intersection which enabled ORV users to stop with plenty of clearance.

Enduro Site - The enduro selected was sponsored by Michigan Dirt Riders Association who are affiliated with the American Motorcycle Association. A table was set up next to the registration area and enduro riders who felt like co-operating and filling out the surveys did so. The enduro was one of three on the Forest and was randomly selected.

ORV camper sites - Near each of the first three sites camping was available as a dispersed recreation activity. In addition Benton Lake had a developed Forest Service campground less than 1/4 mile away with a lake, swimming beach, toilets and a drinking water available.

Sampling Procedures

An accurate estimate of dispersed recreation use is difficult to obtain. The ORV figures for 1979 were obtained primarily by District personnel's observation. Traffic counters had been established on two of the sampled sites; the cycle trail at Benton Lake and the Cedar Creek Cycle Trail. However, District personnel decided that the traffic counters installed were not supplying accurate readings, and hence observation data was used. District personnel indicated that the 1979

use estimate could not be used accurately as a population base. Consequently this study was designed to randomly sample approximately 7% of high use on the sites as determined by the ORV use season. The actual percentage of population sampled was to be verified at the end of the 1980 season by comparing the obtained sample size with the Forest Service total population figures for 1980.

This study was designed to randomly sample ORV riders at specific sites during the peak use summer season in order to obtain a large number of subjects. The sites were chosen for high use to obtain large subject numbers. The literature review and District personnel estimated that ORV use is approximately twice as heavy over a weekend as over 5 weekdays. To obtain as large a sample as possible within time and personnel constraints and to still sample the weekday users, twice as many weekend days were sampled as weekdays. The researcher randomly selected 6 days to be sampled on weekends and 3 days during the week. The District ranger indicated the ORV season exhibits moderate use in June, peak use on three holiday weekends; Memorial Day; July 4th, and Labor Day; and moderate to heavy use between July 4th, and Labor Day. The sample days were selected randomly from the time period beginning July 1, 1980 and ending September 1, 1980. This was the time period the researcher was available on the District.

Using the above data, it was estimated that 7.3% of the use during the peak use season at the 3 sites would be sampled. However, two holiday weekend days were selected by random chance. District personnel estimated that ORV use would peak on the two holiday weekend's sampled (Independence Day and Labor Day weekends). It was suggested that

literally hundred's of riders would be on the sites at these times. This would indicate that the sample would be greater than 7.3%.

Weather was a factor which had to be considered. After discussing whether rain was a deterrent to ORV riding with several ORV riders and the District Ranger it was decided to handle the weather factor in this manner. If the randomly selected day turned out to be pouring down rain which would continue through a sampling time frame the interviewer did not sample that day. Instead the next day in the same strata (weekends or weekday) was sampled if it did not have the same conditions. It was felt sampling in this type of weather conditions would be a wasted effort. However days with moderate, intermittent showers were still sampled. What actually occurred on the District when it rained is discussed in the results section.

The sampling days were stratified into 3-time periods: morning (9 am to 12 am), afternoon (1 pm to 11 pm), and evening (5 pm to 8 pm). One site was surveyed during each time period so that each site was surveyed during the coverage of a sampling day. An hour was allowed between sites so that the interviewer could check dispersed camping areas, administer surveys if necessary, and travel to the next survey station. This technique had three main advantages: 1) it enabled each site to be visited on each sampling day; 2) it enabled data to be collected on each site across the summer forming a composite picture of ORV use on the site over time and 3) it provided some degree of safety for the researcher, who was alone and female, to avoid being in a remote forest spot for any predictable time.

Administration of the Survey

The survey incorporated some of the techniques used in personal interviews and self-administered questionnaires. Smith, Nuxoll, and Galloway (1976) have identified disadvantages associated with these techniques. The disadvantages for personal interviews include: 1) interviewer bias; 2) extensive logistics; 3) high cost; and 4) and its not easily administered over large geographic areas. Disadvantages for self-administered questionnaires include 1) the problem of follow-ups; 2) higher nonrespondant rates; 3) gaining a representative sample population; and 4) getting a recreationist to take recreation time to fill out the questionnarie.

It is believed the procedures outlined previously and in the following section effectively controlled for the above disadvantages. Interviewers were instructed to maintain a neutral attitude towards the respondents and the survey subject. The interviewer asked two filler questions, (See Appendix A for specific wording and instructions for stopping ORV vehicles) to determine if the ORV driver had already filled out a questionnaire, and if not, were they interested in doing so. If the respondents had completed a questionnaire, they were thanked for their cooperation and the contact was broken to avoid duplication in sampling. The interviewer introduced him/herself and briefly explained the study and why the respondents contributions were important. The interviewer then supplied the questionnaire and stood-by to make sure the instructions were clear, to clarify any questions, and if necessary, to help fill out the survey form.

Surveys were to be filled out only by the driver of the ORV vehicle. If a rider was present and intent upon adding comments to the

drivers' response, the interviewer engaged them in conversation unrelated to the survey that was not distracting to the driver. After completion, the interviewer collected the survey, thanked the respondents and answered any questions he/she could not previously in order not to bias the respondents answers. In the case of camping ORV users at Benton Lake, they were asked to return their surveys to the campground hosts. Appendix A includes a summary of the format interviewers were to follow.

The Enduro event selected fell on a previously selected sampling day on the other sites, so the researcher could not supervise the data collection. A volunteer handed out the surveys, and due to other conflicts stayed for approximately an hour and a half before and slightly after the race started.

Benton Lake had two full time campground hosts who volunteered to distribute the survey to any campers who had ORV's with them. This included 4 x 4's, dune buggies, ATV's, and motorcycles. The dispersed camping sites near the Cedar Creek Cycle Trail and North Branch, and were checked out on each sampling day. During the course of the study only one camper was found and surveyed at the Cedar Creek Cycle Trail. Although five camping groups were encountered at North Branch none had ORV vehicles with them. They were fisherman and families camping or local youth partying.

On the first day of sampling, the order of the sites to be visited was randomly selected. Then, the visitation order was rotated in order through the time periods so that each site eventually formed a composite day.

RESEARCH INSTRUMENTS

Questionnaire Development

The questionnaire was designed to: 1) gather data on the frequency and duration of ORV use on the District; 2) identify communication channels used to find District ORV areas as well as gain knowledge of the ORV regulations; 3) enable the ORV user to evaluate the District ORV areas; 4) identify mass media channels users watched read, or listened to; 5) determine the socio-economic profile of ORV riders on the White Cloud District; and 6) determine ORV user attitudes and preferences.

The primary objective used for designing the questionnaire was to obtain the desired information from the largest number of respondents in the most accurate form possible. Research suggests that recall is a reliable measure comprehension and of marketing media impact (Berkman and Gilson, 1978; Engel, Blackwell and Kollat, 1978). Consequently, ORV riders were asked to recall ORV regulations messages in general. The questionnaire was limited to a 15 minute time frame for completion and it was felt the addition of lengthy scales would cut into the time allotted for completion of other pertinent data. However, the pretest was implemented to try and close some of the open-ended questions, yet the response was so low it was felt the questions could not be closed. Portions of the questionnaire neccesitated opinionated responses, comments, and/or recommendations and conventionally structured

close-ended questions might have biased the results. Thus for the purpose of this study, open-ended questions were used. It was felt the scales would be more appropriate in later studies of this population after the ORV users had supplied relevant perceptual information with a minimum of prompting. It was felt open-ended questions would elicit responses which are more realistic, reliable and valid than a structured attitude testing. A combination of open and close-ended question were used as recommended by Sommer and Sommer (1980).

The questionnaire was divided into four sections. An introduction, explaining the purpose of the survey, who sponsored it and a brief rationale for the need for the ORV users input. The second section consisted of socio-economic data, use information, and ORV regulation awareness which were short answer or closed-ended questions. The third section consisted largely of open-ended questions concerning opinions and recommendations, interspersed with a few general close-ended questions. The fourth and last section included information on mass media channels the ORV rider used. A statement at the end was included at the request of Forest Service officials notifying the user where he could obtain ORV information from the Forest Service. In addition it notified the respondents as to where they could contact the researcher if they had questions or complaints. The reason for the section arrangement was based on the assumption that a respondent would react more favorably to questions requiring short answers at the beginning and would thus move into the body of the questionnaire quickly (Sommer & Sommer, 1980). Questions with larger answers were in the center and questions requiring shorter, answers were used at the end.

Two variations of the questionnaire were developed (See Appendix A). Form A was for ORV users who were not actually using their vehicle at the time the research made contact with them (camping ORV users and enduro riders). Form B was given to on-site riders who were actually driving their vehicles. The primary differences in the two forms was the use of verb tense and the length of recall an ORV user needed to answer a question. For example, Question 8 Survey Form A asked: "How many hours a day do you usually ride your ORV?". In comparison, Question 9 of Form B asked: "How many hours, today, will your ORV be in use?". Other subtle differences included the order of questions which was changed only slightly with the questions still remaining in the same section outlined previously. On-site users (Form B) were asked if they used their ORV in competitive events, Enduro riders and campers (Form A) were not. Form A respondents were also asked where they intended to ride on the Forest and whether they would do this primarily on weekends or weekdays. These questions were not asked on Form B because it was felt interviewer observation of where the respondents were and the days they frequented the different sites would reflect this information. The implications of these differences will be discussed in the results section as they are applicable.

Other factors taken into consideration in design of the questionnaire for this survey included questionnaire length, questionnaire attractiveness, and its ease of completion and return. The language was fairly simple and straightforward so riders down to the age of 12 could easily respond to the questions.¹

¹ Two respondents were 8 and 9 years of age, respectively. They were able to answer the majority of questions on their own with minor help from the researcher.

Pre-testing of the Questionnaire

In order to determine problems in the question format and interpretation, questionnaire Form B was pre-tested before final production. The questionnaire was mimeographed and the researcher selected two reportedly high-use ORV areas on the Cadillac District. A different district was used so that the potential respondents on the White Cloud District were not sampled.

The researcher spent 4 hours per site for 2 days sampling on-site ORV users. The pretest sample collected was small (7 respondents), so the pretest was by no means definitive. Minor modifications were indicated in the questionnaire after examining and evaluating the responses. The revised questionnaire was then printed. Due to a low-budget, the questionnaire was printed on plain white paper with a standard type face. An effective use of white space was used to enhance readability (Turnbill and Baird, 1968).

Coding and Processing of Completed Surveys

There was a total of 8 sites or study areas included in the survey yet only 6 yielded information since there were no ORV campers at North Branch, and only one at Cedar Creek.

Each completed questionnaire was coded with a location and survey number for quick identification and retrieval. Only fully completed questionnaires and those which were at least half full were coded and used for analysis. Inappropriate or insensible answers were eliminated. A total of 144 usable surveys were collected.

A code book was prepared, and in the case of the open-ended questions, all actual responses were coded except if very similar

answers were given. These were consolidated into a single dimensional category. Using the code book, questionnaires were coded for computer processing before key punching. A 10% sample was randomly selected and checked for error and accuracy. The error rate was 2% and all errors found were corrected. A 10% sample of key punched cases was randomly checked and no errors were found. A scan of the card printout found the numbers on one card transposed one column to the left. This was corrected and it is assumed the key punching error rate was negliable.

Limitations

Having been guaranteed anonymity, once a subject agreed to fill out a questionnaire it was assumed all answers would be honest and his/her own opinion and not a concensus of a group. All on-site survey was conducted by the researcher. In addition a campground host contacted some camping subjects and another volunteer collected the enduro responses. There were minor differences in individual presentation, but it is felt interview training kept interview biases to the minimum.

In absence of any other socio-economic opinion and media research on ORV users on the Huron-Manistee National Forests it is believed that the data collected will have useful planning and information and education program applications within these National Forests. Findings from this study cannot be considered totally representative of the Michigan ORV user population. In addition, it's usefulness is probably more appropriate for the Manistee National Forest than the Huron because the two forests share slightly different user clienteles.

Unless otherwise noted in the analysis of results the camping ORV users and on-site ORV users are treated as one subgroup (trail riders) and the enduro riders are in the second subgroup. Doing this involves analysis combining form A and form B in subgroup 1. There are minimal limitations involving the slightly different phraseology between the two surveys. The reason for the distinction is it is assumed enduro riders come to the District to use their vehicles for competitive purposes in an organized event. The other ORV riders were on the District for non-competitive purposes.

The typical constraints of time, budget and researcher availability were present. These factors were recognized and the researcher assumed the responsibility of insuring the validity, reliability and accuracy of the sample within these constraints.

RESULTS AND ANALYSIS

The Sample

A total of 84 ORV riders were sampled during on-site interviews at Benton Lake (44), Cedar Creek (31), and North Branch (9). Sixteen subjects were interviewed during the campground survey and 44 riders were interviewed at the enduro. The total number of subjects interviewed during this study was 144.

The non-response rate ranged from 7% to 40% for specific sites. The average nonresponse rate was 22% for the on-site stations. A 22% sample of enduro riders was obtained representing a 6% sample of the summer enduro riders on the district.

ORV Users Knowledge and Awareness of Regulations

To determine whether the majority of ORV users on the White Cloud District were knowledgeable of ORV regulations, subjects were asked what they remembered most about the regulation message. Any response, general or specific, which could be directly related to an ORV regulation was scored as a valid answer for the recall (remember) question.

When the respondents (N=140) replied to a question of general knowledge, 64.3% of them indicated they "knew" or were aware of regulations. However, 102 (71%) of the subjects could not or would not respond to the recall question. Twenty-one (20%) gave a correct

response, 6% gave incorrect responses, and 3% of the subjects complained about the rules (an incorrect response). Overall for the questionnaire the non-response rate averaged 13% per question. After subtracting this figure from the (71%) non-response rate for this question, it was approximated that 58% of the respondents did not respond because they did not recall any specific information about regulations. These results suggest the majority of riders do not know any specific regulations. Appendix B summarises the specific responses (Table B1). The primary sources of information of ORV users' knowledge and/or awareness were through informal information channels. Of all the subjects, 39% received information by word of mouth; 27% from Forest Service sources; and 15% from ORV clubs (see Appendix B).

It was expected that the number of years ORV users have ridden on the Huron-Manistee National Forests would be related to the user's specific knowledge of particular regulations. Using a Chi-square analysis it was determined there was no relationship between the number of years a rider professed to have ridden on the Forest and his knowledge of rules (Table 1).

Table 1

Relationship Between the Number of Years Ridden on the Forest and Knowledge and Recall of ORV Regulations by ORV Riders

Years Ridden	Regulation Knowledge and Recall		
	Accurate % (N)	Inaccurate % (N)	Total % (N)
0 - 1	10.7 (3)	26.2 (27)	23.0 (30)
2 - 5	42.9 (12)	36.9 (38)	38.1 (50)
6 - 10	32.1 (9)	25.2 (26)	26.7 (35)
11 & greater	14.3 (4)	11.7 (12)	12.2 (16)
TOTAL (N)	100.0 (28)	100.0 (103)	100.0 (131)

$\chi^2 = 3.032$; 3df, $p < .3687$; Not significant.

However, the number of years a rider has ridden on the Forest did have a significant relationship with whether he said he was "aware" of the regulations in general. As the number of years of riding increased the rider was more apt to say he knew of the regulations (Table 2).

Table 2

Relationship Between the Number of Years Ridden on the Forest and Awareness of Regulations by ORV Riders

Years Ridden	Regulation Awareness		Total % (N)
	Aware % (N)	Not Aware % (N)	
0 - 1	13.1 (11)	49.9 (18)	22.6 (29)
2 - 5	42.9 (36)	31.8 (14)	39.1 (50)
6 - 10	31.0 (26)	15.9 (7)	25.8 (33)
11 & greater	13.1 (11)	11.4 (5)	12.5 (16)
TOTAL (N)	100.1 (84)	100.0 (44)	100.0 (128)

$\chi^2 = 13.364$; 3df, $p < .0039$; Significant.

Several other variables were expected to relate to knowledge of the rules, but for each case knowledge was unrelated to age, club membership and type of rider (Table 3, 4 and 5). Respondents were asked if they thought that the majority of other ORV riders obeyed the rules. Ninety-one (73%) felt riders did comply, while thirty-three (27%) felt that other riders did not comply.

Those who felt any rules were being violated supplied the following information. The rules perceived to be broken most often included: off-trail riding (32%); not having an ORV sticker (21%); a noisy muffler (13.5%); and no spark arrestor (1.2%). It should be noted that only 39% of the subjects responded to the question (see Appendix B).

Table 3

Relationship Between Age and Knowledge and Recall
of ORV Regulations by ORV Riders

Age	Regulation Knowledge and Recall		
	Accurate % (N)	Inaccurate % (N)	Total % (N)
8 - 19	13.8 (4)	10.0 (11)	10.8 (15)
20 - 29	27.6 (8)	46.4 (51)	42.4 (59)
30 - 39	41.0 (12)	30.9 (34)	33.1 (46)
40 - 49	6.9 (2)	6.4 (7)	6.5 (9)
50 - 62	10.3 (3)	6.4 (7)	7.2 (10)
TOTAL (N)	100.0 (29)	100.0 (110)	100.0 (139)

$\chi^2 = 3.488$; 4df, $p < .4797$; Not significant.

Table 4

Relationship Between ORV Club Membership and
Knowledge and Recall of ORV Regulations

ORV Club Member	Regulation Knowledge and Recall		
	Accurate % (N)	Inaccurate % (N)	Total % (N)
Yes	53.6 (11)	28.2 (24)	26.7 (35)
No	46.4 (17)	71.8 (79)	73.3 (96)
TOTAL (N)	100.0 (28)	100.0 (103)	100.0 (131)

$\chi^2_{\text{obs}} = 2.878$; 1df, $\chi^2_{\text{crit}} = 3.84$ at .05; Not significant.

Table 5

Relationship Between the Type of Rider and
Knowledge and Recall of ORV Regulations

Type of Rider	Regulation Knowledge and Recall		
	Accurate % (N)	Inaccurate % (N)	Total % (N)
Trail Riders	76.7 (23)	67.5 (77)	69.4 (100)
Enduro Riders	23.3 (7)	32.5 (37)	30.6 (44)
TOTAL (N)	100.0 (30)	100.0 (114)	100.0 (144)

Corrected $\chi^2 = .551$; 1df, $p < .4578$; Not significant.

Ignorance and indifference have been perceived as two primary reasons for ORV rule violations. Only 36 subjects (25%) responded to the query of why do people disobey the rules. Of these respondents, 22% felt people's indifference was a reason for noncompliance. Ignorance of the rules was mentioned by 19% and an additional 14% of the respondents indicated they thought that ORV rules were too limiting.

Evaluating the I & E Plan

Several factors enter into the decision of whether or not the I & E Plan was a success: ORV riders knowledge of regulations; the ORV users rating of the FS information dissemination; and whether the media channels used to disseminate ORV information matched the media's used by ORV riders.

As mentioned previously, the majority of riders are not knowledgeable of regulations. When ORV riders were asked to rate how well the Forest Service had advertised the location of ORV areas on the Huron-Manistee National Forests, 40% of the respondents gave it a poor rating, 35% thought it was average, and 25% felt it was above average. A majority of the riders heard of the area through friends or found it just by riding in the area.

A listing of radio and television stations, and magazines and newspapers that ORV riders either watch, listen to, or read are found in Appendix B. Also included are the ORV or other sports clubs that ORV riders belong to. Table 6 summarizes the media most frequently mentioned by ORV users.

Subjects were not asked to differentiate between the media channels as to which one was their primary source of information. The

Table 6

Primary Media Sources for ORV Riders₁

Ranking	Newspapers Sources	N ₂	Radio Sources	N	Television Sources	N	Magazine Sources	N
1	Muskegon Chronical	25	WLAV	27	WZZM	61	Dirt Bike	26
2	Grand Rapids Press	24	WJRD	11	WOTV	6	Cycle News	16
3	Detroit Free Press	21	WRIF	5	WXYZ	4	Cycle	16
4	Detroit News	12	WCXI	4	WILX	4	Mi. M-cycle	13
5	Holland Sentinel	7	WCUZ	4	WNEM	3	Cycle World	7

Note: ₁ Ranked by frequency of responses.

₂ Total N=144

Table 7

Media Utilized in I & E Plan

Ranking	Newspapers Sources	N ₁	Radio Sources	N	Television Sources	N	Magazine Sources	N
1	Pioneer	3	WWAM/	1	WTV	1	None	0
2	Newaygo County Sun	3	WKJF-FM					
3	Muskegon Chronicle	1						
4	Freemont Times Indep.	1						
5	Saginaw News	1						

₁ N is the number of stories in that medium as reported by the District Ranger.

purpose of the media questions was to obtain the most complete list of specific mass media watched, listened to, and read so that an all-inclusive campaign could be developed in the future. However, looking at the frequency of responses for the different media gives an indication of the order of importance of the media. Seventy-two percent of the subjects listed one or more newspapers, 70% listed a radio station, 67% listed a television station and 57% listed one or more magazines (See Appendix B for complete listing of media sources).

Twenty-six percent of the subjects listed two Grand Rapids radio stations, WLAV and WGRD, as the stations they listened to most often. The television station most frequently mentioned was WZZM in Grand Rapids (42%). A small percentage of subjects (4%) indicated they did not watch television at all.

Table 7 summarizes the primary media used by the White Cloud District for disseminating ORV information. The feature articles resulted from personal contact by the District Ranger to the media or to a freelance writer who then sold the story. If the standard news release sent to all media sources was used by the media, the supervisors office has no record substantiating that the release was printed or utilized in a media story.

In comparing the media sources in Table 6 and 7 the primary television and radio stations mentioned by ORV riders on the District were not the primary ones utilized in the I & E Plan. Although ORV clubs are not a mass media channel, a communication network exists among their members. Twenty-five percent of the ORV riders on the District were ORV club members. The American Motorcycle Club was the club most often listed (60%), followed by the Cycle Conservation Clubs

of Michigan (20%) (see Appendix B for other club membership).

Establishing Possible Reasons for Non-compliance

Results mentioned in the first section of this chapter indicated some ORV users felt ignorance and indifference were causes of ORV rule violation. Also, a small percentage indicated the rules were too constricting. Another approach in determining what factors may influence non-compliance is examining why the ORV riders chose the ORV area; what they disliked about it; how they rated it; and what improvements they would like done to the area.

To effectively analyze the question asking why ORV riders had chosen the Forest as their recreation site, the responses to this were divided into 7 categories. Appendix C summarizes how and why the distinctions were made.

Enduro riders were not asked why they chose the site because the site was determined by race sponsors. Campers received the same form as enduro riders and are not included in the following percentages. There were 84 trail riders. Twenty-six riders (31%) indicated they chose the area for reason which fell within the convenience category; and 30% used the site because of the man-made features of the trails. An additional 5% indicated social reasons had influenced their decision. Only 2% of the respondents cited reasons related to the esthetic (woods, wildlife, scenery) attributes of the area (see Table C2 in Appendix C). Specific attributes that were most often mentioned were near home (24%), expert trails (9%) marked trails (5.6%), and numerous or many trails (5.6%).

Subjects were asked what they disliked about the ORV area. The response from motorcyclists was high (102 out of total N of 130). The response from other ORV use was very small (6 out of an N of 14). The dislikes of all ORV users are summarized in Table C1, Appendix C.

Table 8 summarizes the main attributes that ORV riders disliked. To present a focused profile of what factors ORV riders disliked, all the answers were categorized into the dimensions similar to those previously mentioned for why riders chose the ORV area. Appendix C summarizes which answers were included into each dimension.

Table 8

Attributes Least-liked by ORV Users on
the White Cloud District

ATTRIBUTE	RESPONSES ¹ % (N)
Felled trees	12 (18)
Flat terrain	7 (11)
Mud holes	7 (10)
Bumps	5 (7)
Cars and 4X4's	4 (6)

¹ Numbers only include responses from ORV motorcycle riders and not any from 4X4 or dune buggy drivers.

Overall, 51% of the respondents disliked attributes which were within the man-made features dimension; 24% did not like features related to the land; and 11% did not like features related to social situation.

Although there were complaints, overall ratings of the ORV areas by the ORV riders were quite good. On a scale of 1 to 10, 10 being the best, the average score for all ORV areas was 7.8, a score on the positive side of the scale. The standard deviation for the group (2.1) also indicates the rating is clustered on the positive side of the scale from the average (5) to almost the best (10). A t-test of means revealed no statistical difference between enduro riders and trail riders in terms of their rating of ORV areas (Table 9).

Table 9
Mean Rating Scores of ORV Areas by
Enduro and Trailriders

Enduro	Trailriders
$\bar{X} = 7.03$	$\bar{X} = 7.76$
SD = 2.86	SD = 2.05
N = 36	N = 94

Note: Areas were rated on a scale of 1 to 10, 1 being the worst and 10 being the best.
 $T_{obs} = .15$, $T_{av} = 2.57$, $df = 128$, $p < .05$, NS.

Even with the overall favorable rating 58% of the motorcycling ORV users (N=130) had suggestions for improving the ORV areas. Thirty percent of the enduro riders wanted more trails followed by better marked trails (10%). In contrast only 10% of the trail riders wanted more trails and 11% wanted the trails marked better (see Appendix C).

Seven enduro riders indicated a need to restructure the regulations in such a way as to make more country available to them.

Suggestions included opening all lands unless posted closed, opening up closed areas, and having no regulations at all. Only 5% of the enduro riders indicated they would be riding illegally when they responded to the question "where will you be riding" by checking the box "any place attractive".

Increasing the Effectiveness of Future I & E Plans

Defining who the audience will be and how to contact them is an essential part of developing an I & E plan. Additional information on what appeals to the audience is useful in determining message strategies.

A General Profile of ORV Users.

The sport of ORV riding is dominated by male participants (94% male and 6% female in this study). The average age of ORV users on the White Cloud District was 30, the median 29, and the mode 21. Overall, 58 (40%) of the subjects made between \$11,000 and \$20,000 annually. The mean was \$19,000, the median \$17,000 and the mode was \$15,000 (see Appendix B).

Thirty-nine percent of the respondents completed high school and 21% had attended, yet not completed a college education. A small number of respondents held advanced degrees (6.4% beyond a undergraduate level). Employment listed by respondents (N=135) was fairly evenly divided between the following categories: professional and technical workers (24%); craftsmen and kindred, mechanics (16%) and operators and factory workers (20%) (see Appendix B).

Over half (54%) of the trail riders (N=100) indicated that they never compete in ORV competition. Most ORV users (40%) owned only one vehicle, 27% owned two, 19% owned three, and 11% owned four or more (N=144). Kawasaki was the brand owned by the largest group of subjects (22%) followed by Yamaha (19%) and Honda (10%).

A majority of the ORV respondents (N=142) came from within a 50 mile radius of the District (56%). In addition, 17% of the respondents came from a 51 to 100 mile radius, 19% from a 101 to 150 mile radius and only 8% from a greater than 150 mile radius. The percentage of ORV riders who were repeat users on the site as determined by observation was 18%.

✓ Thirty percent of ORV riders found their recreation sites by exploring in the area. An additional 21% found it through a friend and 14% found the areas through an ORV club. Only 2% of the riders reported finding the areas as a result of Forest Service maps or contact with an officer.

When the ORV riders (N=137) came to the District they were usually with a group of friends (49%) or with family and friends (30%). Single family groups were listed by only 10% of the sample. Only 7% of the respondents indicated they were part of an organized group and only a few (3%) came alone.

Use Patterns and Activities of ORV Users.

Figure 3 illustrates the number of years ORV users have ridden on the Huron-Manistee National Forest. Table 10 is a comparison of ORV weekend/weekday use patterns observed and reported in this study, and other studies.

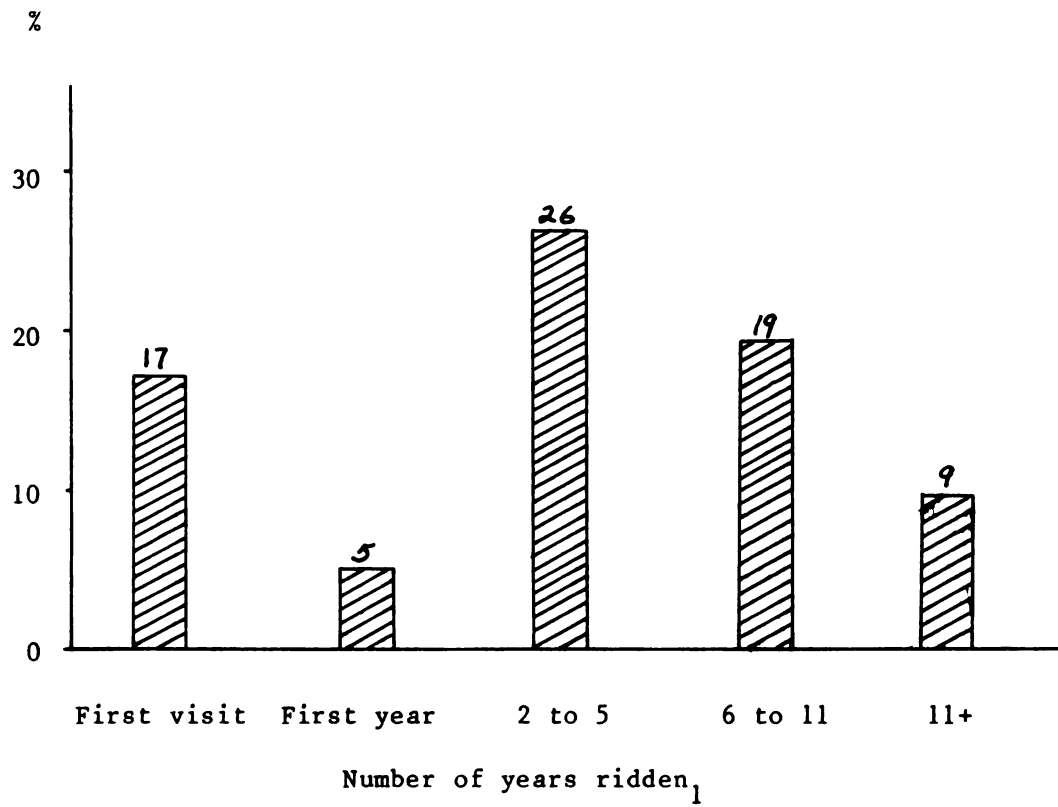


Figure 3. Years ridden on the Huron-Manistee National Forests.

Note: 1 Percentage will not add up to 100%; the non-response was 24%.

Table 10

ORV Use on the White Cloud District
in Comparison to Other Studies

	Enduro Reported Use	Observed ORV Use ₁	Michigan Survey ₂	Allegheny Nat'l Forest ₃
Weekend	71.9%	64.1%	42%	67%
Weekdays	7.0%	35.9%	58%	33%
Both	21.1%			

₁ Observed use was compiled from on-site nonrespondent forms.

₂ Michigan DNR survey report (1977).

₃ U.S.D.A. Forest Service (1978).

On-site riders typically began riding in the morning (72.8%) starting between the hours of 7 am and 12 am. Early morning hours were less favored since 54.6% of all riders started between 10 am and 12 am. Riders starting in the afternoon (1 pm to 4 pm) and evening hours (after 5 pm) occurred less frequently, 24.7% and 2.6% respectively.¹

ORV users rode their vehicle an average of 29 days per season. The duration of ORV use is reflected by the average time (4.7 hours) an ORV rider spends recreating on his vehicle. Since the majority of riders began between the hours of 10 and 12 in the morning this means use is concentrated from 10 to 7 on weekends.

The primary purpose given by ORV subjects for visiting the District was motorcycle riding (58.1%). As expected, 75% of enduro riders primary purpose for visiting the forests was motorcycle riding

¹ Percentages include information from on-site rider not campers or Enduro riders.

as opposed to 52% of the trail riders visiting for the primary purpose of motorcycle riding. Other activities listed in the order of importance included; camping in Forest Service developed campgrounds and dispersed areas, as well as canoeing, fishing and hunting.

ORV Users Reasons for Enjoying the ORV Sport.

Since the survey used primarily open-ended questions there was a need to categorize data. The specific responses of why subjects enjoyed the ORV sport were placed in categories similar to Driver's Recreation Experience Preference Scales (1977). Examples of these dimensions include: experiencing nature, mental change, achievement, general escape, tension release and exercise.

Drivers' (1977) dimensions were used to quantify this data for two primary reasons. 1) The dimensions differentiate between similar responses by attaching them to a specific motivational dimension. 2) The data obtained in this study could be evaluated for the two types of riders (enduro and trail riders) to see if there were differences in their enjoyment of the sport. The following is an example of how the answers were categorized into dimensions.

The dimension of achievement included responses such as skill, competition, and self-accomplishment. These corresponded with the following sentences from Driver's (1977) work:

Because I thought it would be a challenge (challenge).

To try and improve my skills in doing it (skill).

To show others I could do it (competition).

I thought it would give me a feeling of confidence in myself (self-achievement).

Appendix C explains how these distinctions were made and summarizes the responses in each category by user type. Overall, the most important reasons for the White Cloud ORV riders' enjoyment of the sport were experiencing nature (22%), fun and recreation (14%), and a challenge (14%). The dimensions with the most responses for enduro riders included, achievement (26%), followed by experiencing nature (19%) and general escape (14%). For trail riders, experiencing nature received the largest response rate (23%), followed by mental change (18%), and achievement (10%).

Additional Results.

This section includes results of the study that were not specifically covered in the objective of increasing the effectiveness of future I & E plans; yet they are important and relevant findings.

The ORV population of the District was determined by the Forest Service in 1980 by various means including observation and traffic counts (Table 11). Analysis comparing survey use figures and Forest Service use figures indicates a large discrepancy. Comparable figures for the three sites are summarized in Table 12. The most accurate comparisons are of motorcycle use at Benton Lake and Cedar Creek.

All use figures are expressed as use per 1000 visitor days. Forest Service use figures are easily 50% higher than they should be. In addition, figures from this study for the 3 sites were extrapolated into seasonal use figures by using 4.7 hours/day as the average duration of motorcycle use as determined by the study. This should have increased the total visitor days determined by the study to a figure

Table 11 White Cloud ORV Use Figures for 1980

Recreation Composite (Survey Station)		1980	
Roads Recreation	Automobile Use/1000 Visitor days	Motorcycle Use/1000 Visitor days	
Pere Marquette, Newaygo (Benton Lake)	.4	.6	
Hardy-Croton, Newaygo	1.6	2.0	
White River, Muskegon (Cedar Creek)	.1	.1	
White River Oceana (North Branch)	.1	.2	
Little Muskegon, Montcalm	.1	.2	
Little Muskegon, Newaygo	.2	.3	
Subtotal	2.5	3.4	
Trails Recreation			
LCC Cycle Trail Newaygo (Benton Lake)	.0	2.4	
Cedar Creek Motorcycle Trail Muskegon (Cedar Creek)	.0	2.8	
Little Muskegon, Montcalm	0.1	0.2	
Little Muskegon, Newaygo	0.1	0.1	
Subtotal	0.2	5.5	
General Undeveloped Areas			
Pere Marquette, Newaygo	1.5	1.9	
Pere Marquette, Oceana	1.1	1.4	
Hardy-Croton, Mecosta	0.6	0.7	
Hardy-Croton, Newaygo (Enduro)	2.4	4.0	
White River, Muskegon	1.4	1.6	
White River, Oceana (North Branch)	1.8	2.8	
Subtotal	8.8	12.4	
Total	11.5	21.3	

1 District personnel estimate that 4x4, dunebuggy and all terrain vehicle use is 1% of the automobile traffic.

Table 12 Comparison of Forest Service ORV use figures to the 1980 ORV survey¹

Site	Forest Service Data ²			1980 ORV Survey		
	Automobiles	Motorcycles	Other ³	Automobiles	Motorcycles	Other
Cedar Creek	1.4	2.8	0.01	0.01	0.83	0.09
North Branch	1.8	2.8	0.02	0.27	0.18	0.01
Benton Lake	0.4	2.42	0.02	0.13	1.15	0.07

¹ Use figures are based on Forest Service R.I. M. reports.

² All figures are expressed as use/1000 visitor day.
 [((use X duration of use) / 12) X days in the season] / 1000

³ Other category includes 4X4's, dune buggies and all terrain vehicles.

higher than the use figures estimated by the Forest Service which uses 3.1 hr/day for their figures.

In addition, the survey use figures should be higher than the Forest Service's since the sampling period was during the high use period of the summer and included two holiday weekend days. The total size of the ORV population on the District cannot be ascertained by extrapolating the 1980 ORV survey.

DISCUSSION

Knowledge and Awareness of Regulations

The results determined that 80% of the ORV users on the White Cloud District could not provide adequate recall of ORV regulations. Recall is believed to be the accurate estimate of ORV regulation knowledge. It is true that 64.3% of the riders said they knew of ORV regulations, yet only 20% provided accurate recall answers. Unless an ORV rider realizes what the regulation said and can repeat some part of it, professed knowledge should be considered as awareness of the regulation. In other words, the majority of ORV users on the White Cloud District are aware that regulations exist, but they do not know what the regulations are.

Only 20% of the respondents could list a regulation when asked specifically about them. Yet when subjects were asked what rules were broken, 39% listed a viable regulation. This indicated that knowledge of ORV regulations may be somewhat higher than mentioned above but still a majority of users do not know regulations.

The interesting point of this difference may be the attitude of the riders towards being asked about regulatory questions. There was a higher regulation recall response to a question which dealt with the users perceptions of violations as opposed to their recall of regulations when it was related to specific messages given to them by a regulatory agency. The results suggest that some ORV riders may have

reacted negatively to inquiries on specific regulations, or know the regulations in a behavioral sense but cannot verbalize them. When asked their opinions of regulation violations riders could freely associate regulations with perceived violations. This slight indication that there are negative feelings towards regulatory agencies is supported in the results discussing desired improvements needed in ORV areas. A small percentage of enduro riders (14%) seem to feel a need to restructure the regulations in such a way as to make more country available to them. Suggestions from enduro riders included opening all lands unless posted closed, opening up closed areas, and having no regulations at all. Only 5% of the enduro riders indicated they would be riding illegally when they responded to the question "where will you be riding" by checking the box "any place attractive". Only 2% of the on-site trail riders were observed riding illegally. This may be due to ignorance of the rules rather than disregard.

The scope of the problem of ORV riders not knowing ORV regulations increases when you consider the fact that the age of the riders and their number of visits to the Forest and their membership in an ORV club had no relationship to their knowledge of regulations.

Close to three-quarters of the respondents felt the majority of ORV riders were obeying the ORV regulations. However, the results indicated that the majority of ORV users did not know the regulations so it follows that it would be very difficult for them to perceive the regulations being violated. Respondents cited ignorance and indifference as two reasons for non-compliance. Other reasons cited included: adventure; hassle in obtaining ORV registration; problem in getting equipment parts (spark arrestors) that are not stock equipment

and a general dislike of the regulations. The lack of knowledge of ORV regulations may be helpful, if it is not backed by a negative predisposition towards the regulations. Berelson and Steiner (1965) indicated that communication of facts is typically ineffective in changing opinions against an audience's predispositions.

In this sense, since the majority of riders do not know the regulations the potential of an effective I & E program is good. Yet, in developing persuasive message strategies the small number of riders with what appears to be a negative predisposition should be considered.

I & E Plan Evaluation

If the success of the Information and Education campaign conducted by the Forest is measured by the number of ORV users who were knew ORV regulations, then the plan was a failure as indicated by the low percentage (20%) of riders who knew a general regulation. Considering the information available to planners of the I & E program, the plan was good in principle. The Forest Service could not target the correct media outlets unless they have the type of data this study provides.

Overall, the majority of riders felt the Districts advertising of ORV areas was average to poor (40% and 35% respectively). This tends to indicate that general information on the ORV areas is not reaching the ORV audience.

Several metropolitan newspapers, radio, and television stations were not utilized in the past I & E plan. The District had no way of knowing which medias would be the most effective in reaching the intended audience. Only one Cadillac radio station was contacted, and no television coverage was obtained. However 37% of the respondents

indicated that they listened to two Grand Rapids radio stations, WLAV and WGRD, and over half of the respondents mentioned one particular Grand Rapids television station, WZZM. The results (Table 6 and 7) indicated that the media utilized in the I & E Plan were a poor match with the media ORV riders used.

Thus the likelihood of the I & E plan reaching its intended audience through the targeted media channel was minimal. The respondents in this study listed at least one television or radio station as a media source. These media can be utilized by using their public service announcements or through the news departments and public affairs programming. A Gallup poll noted that radio commercials received an 8% registration (in a test measuring recall) against a 10% level for television (In: Berkman and Gilson, 1978).

Subjects were not asked to differentiate between the media channels as to which one was their primary source of information. The purpose of the mass media questions was to obtain as much information about the media patronized so that an inclusive campaign could be developed in the future. However, looking at the frequency of responses for the different media gives an indication of the order of importance of the media. Seventy-two percent of the subjects listed one or more newspapers, 70% listed a radio station and 66% listed a television station and 57% listed one or more magazines.

The primary newspapers mentioned were in descending order, the Muskegon Chronical, Grand Rapids Press, Detroit Free Press, and the Detroit News. Only one of these papers was listed by the Forest Service as having published ORV feature stories.

All of the media sources the respondents listed are summarized in Appendix B and are individually ranked in order from the highest frequency to the lowest. These tables can be used to target the media for a future I & E program on the District.

The type of information to be included in the campaign will take careful consideration. It is not within the scope of this research paper to design the individual message strategies for a future I & E plan. However it is beneficial at this time to point out factors which may play a significant role in the development of the campaign.

Possible Reasons for Non-compliance

Results of this study indicated convenience was a primary factor in choosing the ORV site. Only a two respondents mentioned esthetic attributes of the area. This indicates that the esthetics of the land is not a primary concern in choosing an area. However, experiencing nature was an important dimension for 22% of the riders when they listed reasons for enjoying the ORV sport. If experiencing nature an important dimension in the enjoyment of the sport then perhaps an effective communication strategy would be to inform users of environmental damage resulting from the sport. If non-compliance is a result of ignorance and indifference to the rules than appeals connecting the rules to a perception the ORV rider can relate to (experiencing nature) may be effective.

ORV riders, in general, disliked attributes related to man-made features; comments frequently mentioned felled trees, closed trails and trail markings. Land features were also mentioned as being disliked. Responses included flat terrain, mudholes and bumps.

The complaint about flat land is understandable since the White Cloud District is not known for having hills. It does have a moderately rolling terrain with occasional hills, however. This suggests that a small percentage of riders (7%) would like more hills in ORV areas. It is possible that hills nearby legal riding areas are very strong attractions to riders. A review of the trails may indicate where legal hill climbs could be added to the ORV legal areas.

Fallen trees, however, are another matter. One possible reason for this complaint is that felling trees to make ORV barriers is a common practice used in closing an ORV area or hill climb. Land managers survey trails and roads regularly to eliminate these hazards on approved areas. It could be suggested that the problem with fallen trees may result from encounters during cross-country travel or on favorite hill-climbs that have been closed. Riders disliking trail closures indicates a need to communicate the rationale for closures.

Only a small percentage of respondents (2%) indicated trail marking was a problem. Yet poorly marked trails is a serious problem. If ORV riders can not follow the marking for legal riding areas it increases the likelihood of illegal travel.

Eleven percent of the respondents mentioned a dislike for running into other recreationists. Comments included a dislike of running into other vehicles or horseback riders. A rationale for having legal ORV areas could mention the fact that the areas are designed to keep such conflicts to a minimum.

Overall, it appeared the ORV riders viewed the present ORV areas favorably, seemingly indicating satisfaction with legal ORV areas. However since a large number of users do not know ORV regulations, it

may be that the users satisfaction with ORV areas includes illegal and legal use.

This is further reflected by the results indicating users desired more and better marked trails. Also, a small number of riders (7) wanted to restructure regulations to make more land available.

Presently, the legal ORV areas are not congested and do not appear to be heavily used. Therefore the non-compliances problem might be decreased if ORV riders were more aware of other legal opportunities available.

Effective I & E Plans in the Future

In regard to implementing an Information and Education program on the Forest the potential to contact ORV riders with regulation messages appears good. The use patterns and activites of ORV riders on the District give an indication of effective methods of contacting riders on the district. Five factors should be considered: 1) the percentage of repeat users observed (18%); 2) the percentage of riders who indicated they had spent 2 or more years riding on the Forest (71%); 3) the fact that the majority of the riders (56%) are from within a 50 mile radius of the District; 4) 25% of the riders are club members; and 5) the fact that enduro riders represent approximately 10% of the total ORV use on the District.

The above factors indicate that the future I & E plans must give equal weight to disseminating messages at the District level as well as through mass media channels. The success of the I & E plan may have been limited because the local media was not saturated and the apparent effect of normal signing on the district was minimal. Since only 21% of

the ORV riders were first year visitors it can be assumed the majority of riders composed a potential audience for the I & E messages when they were disseminated in 1979 and 1980, yet the connection was not made.

In addition, club members and enduro riders are an easily accessible audience, representing roughly 35% of the ORV population on the District. Therefore, an I & E Plan that focuses on the local area and clubs and enduros should be effective. The following results are helpful in improving the dissemination of the plan. One of the reasons ORV riders did not connect with the I & E messages is probably because ORV riders typically do not stay in Forest Service campgrounds where ORV messages are posted on bulletin boards. Only 13% of the total subjects interviewed become aware of regulations via a Forest Service bulletin board. An additional 14% had gained regulation information from either a Forest Service officer or brochure.

It would probably be more cost-effective if ORV regulation information was made available at ORV dealerships within a 50 mile radius of White Cloud. When contacting ORV dealerships, the primary dealerships that should be contacted first are those that stock the three most frequently owned brand of ORV's this study reported.

Contacting the ORV user on the District is especially important if you consider how many ORV riders cannot be contacted through a mass media channel. The percentages of ORV riders who did not watch TV, listen to a radio, or read a newspaper were all under 4%. Consequently there is a small percentage of ORV riders (4%) who were not consumers of at least one mass media channel. There is still a potential to reach this small percentage of the riders through contact initiated on the

District by signing, direct contact by a enforcement officer, or word of mouth from other ORV users. Information packets could be distributed at enduro or club events. However, mass media channels have the potential of reaching the majority of ORV riders that use the White Cloud District.

Before discussing the implications of the media data gathered it should be mentioned that ORV users' patterns and activities need to be understood to allow for effective law enforcement. The results indicated rider use is concentrated on weekends between the hours of 10 a.m. and 7 p.m.. These results are not startling as they are reflected in other ORV studies. In addition, weekends are a peak time for other dispersed recreation activities. Yet, the results imply that heavier staffing during these hours would increase the effectiveness of enforcement by having the officers on duty during the peak hours.

Developing the message strategies will be an important part of a future I & E program. The strategies discussed previously will guide the plan to targeted media dissemination. The results indicating reasons for non-compliance and the perceptions of why ORV riders enjoy the sport are essential in developing message strategies.

Future I & E programs should also contain a plan to evaluate effectiveness and provide feedback to improve the plan. When developing the objectives of the plan, goals that can be measured can provide the basis for analysis. It will be extremely difficult to measure the effectiveness of attitude change as a result of an I & E program unless it results in a behavioral change. Behavioral change could be measured by observing increased compliance of ORV users or less use on illegal ORV areas. But the reliability of observations by the District

in estimating ORV use and environmental damage needs to be improved before this can be used as an indicator.

In the beginning of this report the difficulty in obtaining accurate use figures on dispersed recreation areas was pointed out. The results illuminate this fact by indicating Forest Service use figures are easily 50% higher than what they should be. On a scale of 1 being the most accurate and 5 being the least accurate, the District rates it's use figure at the 4 level. The survey use figures on 3 sites were biased upwards because of sampling during the peak use season. However, they probably reflect use on the three sites accurately, because of similarities to the methods used to obtain a rating of 1 by Forest Service criteria.

Techniques to meet the FS criteria involve: 1) selecting 2 or three key indicator sites; 2) selecting randomly 6 to 8 sample days between May 30 to September 7, half the sampling to occur on weekdays and half on weekend days; 3) observing recreation use on each site by spending a half hour at each walking through the area and recording activities; 4) spending 1/2 hour at each site counting people entering it to supplement traffic counter readings; and 5) rotating visits to each site on a sampling day by starting at one site for an hour then moving to the next for an hour and rotating the site visits until the end of a sampling day (James, 1966; James and Ripley, 1963).

This survey sample used the following methods: 1) three sites were selected that represented the ORV population; 2) 9 days were selected between June and September; 6 of the days were randomly selected on weekends and 3 randomly selected on weekdays; 3) recreation use was observed and recorded at each site; 4) recreation visitors were

tallied; and 5) the observer spent 3 hours on each site and then rotated to the next until the sampling day was completed.

The above similarities indicate the survey figures should be more accurate than the Forest Service figures on the three sites. To increase the accuracy of FS survey figures will incur increased costs. If the ORV problem is a high priority, perhaps funds should be made available to do so.

In the meantime, observation of the ORV activity revealed several use patterns which should be considered. Aside from mechanical problems with setting up and maintaining traffic counters, placement is crucial. The traffic counters at Benton Lake and at Cedar Creek were set close to major traffic areas (a staging area and a heavily used dispersed campground).

At Cedar Creek, ORV riders would often loop around the trails near the staging area several times to make sure the bike was running well before the riders started trail-riding. On Benton Lake this problem is even more pronounced. ORV campers would let their children ride close to the campsite and they would end up making circles around the area frequently. Observation of ORV area activity before and after establishing a sampling spot would be extremely beneficial in increasing the accuracy of traffic counters.

SUMMARY AND RECOMMENDATIONS

At the start of this paper it was asked "Is there an ORV problem?" According to Forest Service land managers, yes there is a problem because ORV users are riding illegally and environmental damage and user conflicts are occurring. Yet, this problem seemingly doesn't exist in the world of the riders. Although riders are "aware" there are regulations they do not know what the regulations are in a specific sense; yet they perceive the majority of ORV riders as complying with ORV regulations. This suggests part of the problem lies within the differences in attitudes. Wendling's (1976) study focused on the perceived differences between land managers viewpoints and the ORV riders viewpoints. He found that the majority of trail riders had negative images of the government managers regardless of the quality of the site the riders were using.

This study supports the contention that communication is the backbone of a compliance program. People need to have relevant information upon which to base an attitude. Communication through mass media, signs, and enforcement officers may initiate ORV users to change their attitude and perhaps even their behavior. Testing this assumption, however is beyond the scope of this research study, but it is the next logical step.

In the meantime, as a result of this study, it has been determined that there is a communications breakdown between the regulating

agencies and the ORV riders who are regulated. The extent of the problem being a behavioral one has not been determined, nor can it be until it has been ascertained that people know the regulations. The indications are that behavioral problems exist. Since the majority of riders are "aware" that regulations exist but do not know them, this study's observations and results suggest that this may occur because: information on regulations is not easily obtained; and ORV riders do not like being regulated.

In this society, it is the citizens' responsibility to be aware of laws regulating their behavior. Ignorance is rarely a good defense in court. However, this is an issue dealing with on conflicts arising over an activity undertaken during people's leisure time on public land. In this case, the regulating agencies have a responsibility to make the information readily available to the public. Signing on the District is a major form of communications to recreationists. Yet vandalism of signs is a common problem in dispersed areas, thus other communication channels are needed in the area to supplement signing.

X One of the ways the White Cloud District can effectively deal with the above problems is to educate and inform the public as to how and why the regulations exist. In the future, the major thrust of an I & E program on the District should be to 1) inform the majority of the riders of the rules in such way that the riders perception of the rules become more positive; and 2) promote better public relations. Based on the survey results, the District should consider the following elements in a future information and education program for ORV users.

- 1) Messages should appeal to a younger audience in their late 20's and early 30's.

- 2) The important dimensions of the sport that appeal to the rider should be incorporated into the message design to:
 - a) catch their attention and arouse their interest.
 - b) increase awareness of recreationists conflict with ORV riders.
- 3) Messages should be clear, concise and simple.
- 4) Stressing the environmental "costs" of illegal riding may be used effectively as one aspect of the campaign.
- 5) The District should be more involved with the DNR to facilitate the ORV rider education programs in the area.
- 6) Messages should include positive information such as where good ORV areas are located so that the riders do not tune out the message, before they are informed of the regulations and how the rules have helped minimize problems for the rider as well as other users.

Message dissemination on the District should increase the utilization of the radio and television mediums. It was noted that 4% of the ORV riders on the District did not list any mass media or ORV club connections and cannot be reached by these mediums. If an effective campaign is disseminated successfully, this small percentage of people may become aware of the regulations through informal information channels. The dissemination strategy should concentrate on the following:

- 1) Target the specific media mentioned by ORV riders within the 50 mile radius.
- 2) Concentrate on radio and television outlets since this is where the previous plan was lacking.

- 3) Over a period of time saturate these media with the messages repeatedly. Repetition will increase recognition, if not recall of the message strategy.
- 4) Utilize free public air time effectively by developing radio and T.V. ads.
- 5) Potential contacts at the local level (i.e. county fairs, enduro races) should be established and ORV information should be easily available on the District.
- 6) The other metropolitan areas identified during this study should also receive the ORV messages, but for cost-effectiveness the major emphasis should be focused closer to the White Cloud District.

In general, the majority of the ORV riders were satisfied with the current areas offered by the White Cloud District. However, there was an indication that ORV riders desired more trails to be built. On the basis the results of the study suggest the following recommendations:

- 1) No new trails be established until an accurate estimate of present use and future demand is made. This estimate should access recreation opportunities being developed by the state. Michigan is currently expanding trails and establishing new ORV areas.
- 2) ORV trails and areas with cross-country travel permitted a currently available could be advertised as alternate ORV use sites so the riders are well aware of legal riding areas available to them.
- 3) Better advertising of the existing trails be incorporated into the I & E program.

It would appear that the present method of closing an area with felled trees is an effective one, since it is one thing the riders like the least. When possible a combination of felled trees and water barriers would probably be the most effective deterrent. The other land features that riders disliked are too general or too dependent upon the riders skill to be successfully incorporated into a management program.

The comments concerning the specific trails should be considered. ORV users feel that the trails need to be better marked and other suggestions included keeping the trails from crossing roads and having one-way trails. These are included for consideration, not as recommendations. There are many factors involved in trail maintenance and design which are too numerous to be discussed adequately in this report. However, the trails and areas should be reviewed to see if these complaints are justified. If so, then proper action should be initiated to correct the problems.

In summary, ORV use has evolved into a controversial topic. On the White Cloud District ORV riding has developed into a highly regulated recreation in comparison to other outdoor recreation activities such as hiking or birdwatching. This is because the nature of the sport makes it more intrusive into other recreationists' "space" through noise or the visual impact of the treads left on the landscape.

It remains, however, a very valid, exciting, and dynamic form of recreation. The types of riders who come to the White Cloud District require a large land base with the esthetic qualities similar to those desired by other recreationists. Overall, this study indicates the present ORV areas have the potential to satisfy the vast majority of riders on the White Cloud District. But, there is a need to let people

know that the potential is there. An expanded Information and Education program is warranted on the White Cloud District. It should inform the public of ORV areas and motivate them to comply with ORV regulations.

APPENDIX A

APPENDIX A

Interviewer Instructions

Data will be collected by surveying at three major ORV use sites: at campgrounds, at on-site ORV areas, and at an enduro. The methods will involve a survey questionnaire introduced through personal contact by the interviewer. The data collection overlaps in such a way that it is possible that a subject may be contacted twice. To avoid double sampling and interviewer bias all interviewers will follow the general procedures outlined below.

Although you may or may not be in favor of ORV use on the Forest, please keep in mind:

- 1) A biased for or against presentation could invalidate the study.
- 2) Be objective, keep conversation friendly but brief to help eliminate bias.
- 3) If negative attitude is apparent on the part of the interviewer, it will be harder to gain the cooperation you need and you'll be wasting your time in the field.

On arriving at the site, the interviewer will set up a sign and try and flag down ORV riders. For those who stop, it will be determined whether they were contacted in a campground. If not, only the driver will be handed a survey form; provided he/she is willing to fill out

the form. If the ORV user declines, the interviewer will try to determine non-respondent data by filling out non-respondent Form 1.

On the site - try to avoid long conversations but some information is necessary.

- 1) Introduce yourself, identify yourself.
- 2) Introduce the study using the introduction on survey form.
- 3) Stress
 - a) study sponsors: U.S. Forest Service, Michigan State University.
 - b) Anonymous responses: information cannot be traced to individual, yet each individual helps present a picture of the whole group.
- 4) If asked, or feel it's necessary to gain subjects response to the interview - explain why the study is being conducted.

ORV users will probably best relate to the following reason. The Manistee National Forests is in the planning stage for ORV management. In order to provide adequate recreation experiences for ORV users as well as analyze the riders concerns and problems, this study has been independently funded to evaluate ORV riders opinions on the White Cloud District. Other reasons for conducting the study include:

- 1) it relates to other ORV user studies across the country.
- 2) it determines if there's a communication problem between the Forest Service and ORV recreationist.

In every case this standard introduction will be given. "Hi, Michigan State University is conducting a survey to evaluate the Manistee National Forest's ORV regulations and the quality of the ORV sites. This study provides a chance for the actual users to comment on the surrounding ORV areas and Forest Service regulations. If you would like to contribute information to this study please take this opportunity to fill out a survey. It only takes about 15 minutes of your time."

Campground sampling was conducted by the campground hosts at Benton Lake campground and the researcher at three dispersed camping areas. The days surveyed for campground sampling will be the same as the number of random sample days for on site users. Campground interviewers will follow the same guide lines outlined previously.

A1

ORV RECREATION SURVEY

Department of Parks and Recreation

Michigan State University

This survey is an important part of an ongoing study of ORV user expectations and preferences on the Huron-Manistee National Forests. The information you provide will help to define and locate problems, relate to future ORV recreation design and planning, and provide public participation in planning and operations. Your experience and insight cannot be duplicated from any other information source and are essential elements in the success of this study.

We very much appreciate your time and cooperation. This questionnaire is anonymous because in no way can it be traced back to an individual.

FOR OFFICE USE

Date _____

Time _____

Location _____

A2

SURVEY FORM A

- 1) Are you the major driver of the vehicle on this trip?
Yes ☐ No ☐
- 2) Age ☐ 3) Sex: M ☐ F ☐
- 4) Occupation _____
- 5) Where do you live? City _____ State _____
County _____ Zip _____
- 6) How many ORV's do you own? 1 ☐ 2 ☐ 3 ☐ 4 ☐ >4 ☐
- 7) What make(s) of vehicles _____,
_____.
- 8) How many hours a day do you usually ride your ORV? _____
- 9) What days of the week do you usually ride?
Weekends ☐ Weekday ☐
- 10) How many days per year do you drive your ORV on the Huron-Manistee
National Forests for recreation? (Do not include snowmobiles)

- 11) What was your primary purpose for visiting the Huron-Manistee
National Forests? _____
- 12) What other activities will you be participating in while on the
Huron-manistee National Forests?
- | | |
|--|--|
| ☐ Forest Service
Campground | ☐ Fishing |
| ☐ Camping - other
developed campground | ☐ Hunting |
| ☐ Camping - other | ☐ Canoeing |
| ☐ Hiking | ☐ Other (please list) |
| | ☐ |

A3

- 13) Do you know about Federal ORV regulations on the Huron-Manistee National Forests? Yes _____ No _____

If yes, where did you learn about the regulations?

[] Forest Service brochure

[] Contact with Forest Service Office

Local Media: Television [] Radio [] Newspaper []

[] Through ORV Club

[] Posted on Forest Service bulletin board

[] Word of Mouth

[] Other, please list: _____, _____, _____

- 14) What do you remember most about the announcement/regulation message? _____

- 15) Do you think most people follow the official ORV rules for this Forest? Yes [] No [] What rules are probably broken most often? _____

Why? _____

- 16) Where will you be riding your ORV while on the Huron-Manistee National Forests?

[] Designated ORV Sites Which ones? _____

[] Trails Which ones? _____

[] Any place Attractive Which ones? _____

[] Roads Which ones? _____

- 17) How did you find out about or find the above areas? _____

A4

18) What characteristics of the terrain makes a good ORV recreation area on the Huron-Manistee? (please list.) _____

19) How would you rate the Huron-Manistee National Forests for ORV recreation on a scale of 1 - 10? 10 being the best. _____

20) What obstacles do you least like to run into? _____

21) Which of the following best describes the group you're here with today?

- | | |
|--|--|
| ☐ came alone | ☐ group of friends |
| ☐ one family | ☐ family and friends |
| ☐ one couple | ☐ other (please list) |
| ☐ organized group | ☐ |

22) Could you please indicate your approximate annual income for 1979 before taxes? _____

23) Please check the highest level of education completed

- | | |
|---|---|
| Attended Grade School ☐ | Attended College ☐ |
| Completed Grade School ☐ | Completed College ☐ |
| Attended High School ☐ | Graduate Education ☐ |
| Completed High School ☐ | Post Graduate ☐ |

24) What improvements do you feel should be made in this ORV recreation area? (Please list.) _____

A5

25) Please list some of the reasons you enjoy the ORV sport?

Why?

Please circle the one reason that is most important to you.

26) How willing are you to support user fees to develop, maintain and rehabilitate ORV areas and trails? Very willing []

Somewhat willing [] Indifferent [] Not willing []

27) Which of the following methods do you prefer to fund development, maintenance and rehabilitation of public ORV areas? Please list in order of importance, #1 being the most important.

[] General tax funds (taxes all people small percentages for ORV)

[] Entrance fee charge

[] User fee charge

[] Combination of entrance and user fees

[] Vehicle registration fees

[] Gasoline tax revenue

[] Other (Please list)

28) How many years have you been driving your ORV on the Huron-Manistee National Forests?

1st Time _____ Exact number (years) _____

In order for the Forest Service to improve it's information effort and for it to be able to notify you of ORV policy changes, would you please complete the following information.

A6

29) What do you think of the Forest Service's present methods of advertising the location of ORV areas on the Huron-Manistee National Forests?

Good [] Average [] Poor []

30) What ORV or Sports Magazines do you subscribe to?

31) What is the type and specific radio station you listen to most often? (Example: Jazz, WJZZ) _____

What is the type and specific TV station you watch most often?

What newspapers do you read? _____

32) Do you belong to any ORV or other special interest clubs or organizations? Yes [] No []

Which ones? _____

Comments:

Thank you for your time and cooperation! Have a nice day. If you would like to be on a Forest Service mailing list for new ORV maps and publications, please contact the Huron-Manistee National Forests, Supervisor's Office, 421 South Mitchell Street, Cadillac, Michigan 49601. If you have any questions about this survey please contact or mail the form to Phyllis Dorman, Department of Parks and Recreation, Michigan State University, East Lansing, MI 48864.

B1

ORV RECREATION SURVEY

Department of Parks and Recreation

Michigan State University

This survey is an important part of an ongoing study of ORV user expectations and preferences on the Huron-Manistee National Forests. The information you provide will help to define and locate problems, relate to future ORV recreation design and planning, and provide public participation in planning and operations. Your experience and insight cannot be duplicated from any other information source and are essential elements in the success of this study.

We very much appreciate your time and cooperation. This questionnaire is anonymous because in no way can it be traced back to an individual.

FOR OFFICE USE

Date _____

Time _____

Location _____

B2

SURVEY FORM B

- 1) Are you the major driver of the vehicle on this trip?
Yes ☐ No ☐
- 2) Age ☐ 3) Sex: M ☐ F ☐
- 4) Occupation _____
- 5) Where do you live? City _____ State _____
County _____ Zip _____
- 6) How many ORV's do you own? 1 ☐ 2 ☐ 3 ☐ 4 ☐ >4 ☐
- 7) What make(s) of vehicles _____,
_____.
- 8) What time did you start driving your ORV today? _____
- 9) How many hours today will your ORV be in use? _____
- 10) How many days per year do you drive your ORV on the Huron-Manistee National Forests for recreation? (Do not include snowmobiles.)

- 11) What was your primary purpose for visiting the Huron-Manistee National Forests? _____
- 12) What other activities will you be participating in while on the Huron-manistee National Forests?
- | | |
|--|--|
| ☐ Forest Service
Campground | ☐ Fishing |
| ☐ Camping - other
developed campground | ☐ Hunting |
| ☐ Camping - other | ☐ Canoeing |
| ☐ Hiking | ☐ Other (please list) |
| | ☐ |

B3

12b) Have you ever driven your ORV in competitive events?

☐ Never ☐ Occasionally ☐ Regularly

13) Do you know about Federal ORV regulations on the Huron-Manistee

National Forests? Yes _____ No _____

If yes, where did you learn about the regulations?

☐ Forest Service brochure

☐ Contact with Forest Service Office

Local Media: Television ☐ Radio ☐ Newspaper ☐

☐ Through ORV Club

☐ Posted on Forest Service bulletin board

☐ Word of Mouth

☐ Other, please list: _____, _____, _____

14) What do you remember most about the announcement/regulation message? _____

15) How did you find out about this ORV area? _____

16) What made you choose this site rather than other sites for ORV recreation. Please be specific i.e. type of terrain, etc.

17) Which of the following best describes the group you're here with today?

☐ came alone

☐ group of friends

☐ one family

☐ family and friends

☐ one couple

☐ other (please list)

☐ organized group

☐

B4

18) Could you please indicate your approximate annual income for 1979 before taxes? _____

19) Please check the highest level of education completed

Attended Grade School [] Attended College []

Completed Grade School [] Completed College []

Attended High School [] Graduate Education []

Completed High School [] Post Graduate []

20) What do you most like about this area or trail? _____

21) What do you least like about this area or trail? _____

22) On a scale of one to ten, how do you rate this area or trail?

10 being the best. _____

23) What improvements do you feel should be made in this ORV recreation area? _____

24) In your opinion, do you think most people follow the official ORV rules for this Forest? Yes [] No [] If rules are broken, in your opinion, which rules are probably broken most often?

Why? _____

25) Please list some of the reasons you enjoy the ORV sport?

Of the above reasons, please circle the one which is most important to you.

B5

26) How willing are you to support user fees to develop, maintain and rehabilitate ORV areas and trails? Very willing []

Somewhat willing [] Indifferent [] Not willing []

27) Which of the following methods do you prefer to fund development, maintenance and rehabilitation of public ORV areas and trails? Please list in order of importance, #1 being the most important.

[] General tax funds (taxes all people small percentages for ORV)

[] Only entrance fee charge

[] Only have user fee charge

[] Combination of entrance and user fees

[] Vehicle registration fees

[] Gasoline tax revenue

[] Other (Please list)

28) How many years have you been driving your ORV on the Huron-Manistee National Forests?

1st Time _____ Exact number (years) _____

In order for the Forest Service to improve it's advertising and for it to be able to notify you of ORV policy changes, would you please complete the following information.

29) What do you think of the Forest Service's present methods of advertising the location of ORV areas on the Huron-Manistee National Forests?

Excellent [] Good [] Average [] Poor []

30) What ORV or Sports Magazines do your subscribe to?

B6

31) What is the type and specific radio station you listen to most often? (Example: Jazz, WJZZ) _____

What is the specific TV station you watch most often?

What newspapers do you read? _____

32) Do you belong to any ORV or other special interest clubs or organizations? Yes ☐ No ☐

Which ones? _____

Comments:

Thank you for your time and cooperation! Have a nice day. If you would like to be on a Forest Service mailing list for new ORV maps and publications, please contact the Huron-Manistee National Forests, Supervisor's Office, 421 South Mitchell Street, Cadillac, Michigan 49601. If you have any questions about this survey please contact or mail the form to Phyllis Dorman, Department of Parks and Recreation, Michigan State University, East Lansing, MI 48864.

AREA or T-R-Sec #:	DATE	TIME
--------------------	------	------

NON-STOP

REFUSAL

[illegible]

APPENDIX B

APPENDIX B
SUPPLEMENTARY TABLES

Table B1
Responses to General Recall of ORV Regulations

Accurate Responses ¹	%	(N)
ORV sticker needed	8.3	(12)
Stay on trails or 2-tracks	3.5	(5)
Trail use limited	2.1	(3)
Safety	2.1	(3)
No water crossing	0.7	(1)
Spark arrestor needed	0.7	(1)
Go slow in campgrounds	0.7	(1)
There are fines	0.7	(1)
Helmets	0.7	(1)
Prevent forest fires ²	0.7	(1)
All trails closed	0.7	(1)
Inaccurate Responses	%	(N)
Nothing really	2.8	(4)
Requirements for cycles	1.4	(2)
Didn't like	1.4	(2)
No bikes	0.7	(1)
No baths in the lake	0.7	(1)
Too many restrictions	0.7	(1)
Discriminating rules	0.7	(1)
No Answer	70.9	(102)

Note: ¹ These are accurate responses as they relate in a general way to an ORV regulation.
² Spark arrestors are required to cut down on fire hazard.

Table B2

Source of Knowledge of ORV Regulations

Source	Response % (N)
Word of mouth	39.2 (56)
ORV club	14.7 (21)
Forest Service bulletin board	12.6 (18)
Forest Service officer	7.7 (11)
Forest Service brochure	6.3 (9)
Newspaper	5.6 (8)
Radio	4.2 (6)
Magazines	3.5 (5)
Cycle dealership	2.1 (3)
License bureau	1.4 (2)
TV	1.4 (2)
ORV regulation pamphlet	0.7 (1)
Job	0.7 (1)
Total	100.0 (143)

Table B3

Common Regulation Violations as Perceived by ORV Users

Violation	Response % (N)
Off-trail riding	31.8 (21)
No ORV sticker	21.2 (14)
Noisy muffler	13.6 (9)
No spark arrestor	12.1 (8)
Littering	7.6 (5)
Speeding	3.0 (2)
Riding in closed area	3.0 (2)
Reckless driving	3.0 (2)
Trespassing	1.5 (1)
Tree cutting	1.5 (1)
Damage to the environment	1.5 (1)
Total	100.0 (66)

Table B4

Summary of Radio Stations Mentioned by
ORV Riders on the White Cloud District

RADIO STATIONS	RESPONSE FREQUENCY
WLAV	28
WJRD	11
WRIF	5
WCUZ	4
WCIX	4
WMUS	4
WKBZ	3
WZZR	3
WOOD	3
WZND	2
WMDV	2
WAKD	2
WPLB	2
WCMF	2
WWKQ	2
WMUJ	2
FMSD	2
WIKS	2
WHNN	2
WLPX	1
WUOM	1
WUUV	1
WABX	1
CKLW	1
WABX	1
WUKV	1
WLUP	1
WTRC	1
WIDT	1
WJR	1
WKKM	1
WZZM	1
WCCW	1
WKNX	1
WBRN	1
WCEN	1
WOMC	1

Table B5

Television Stations White Cloud ORV Riders Watch

TV STATION		RESPONSE FREQUENCY
Call Letters	Location	
WZZM	ABC Muskegon	61
WOTV	NBC Grand Rapids	6
WXYZ	ABC Detroit	4
WILX	Jackson	4
WKZO	Kalamazoo	3
WNEM	Bay City	3
	CBS Muskegon	2
WJIM	Lansing	2
WKBD	Detroit	2
WTHR	Indianapolis, Ind.	2
WWTV-WWUP	Cadillac	1
WPBM-WTOM	Cadillac	1
WWJ	NBC Detroit	1
WJRT	Flint	1
WNUD	South Bend, Ind.	1
TV10	Hillsdale, Ill.	1

Table B6

Magazines White Cloud ORV Riders Read

MAGAZINE	RESPONSE FREQUENCY
Dirt Bike	26
Cycle News	16
Cycle	16
Michigan Motorcycle	13
Cycle World	7
Baseball Digest	6
Cycle Guide	5
Motorcross Action	5
Four-wheeler	5
Dunebuggy	3
Hot VW	2
Michigan News	2
Sports Illustrated	2
American Motorcyclist	2
Popular Cycle	1
Easy Rider	1
Iron Horse	1
Rider	1
CCC Magazine	1
Snowmobile News	1
Snowweek	1
Michigan Sportsman	1
Field & Stream	1
Michigan Outdoors	1
Sports Afield	1
Outdoor Life	1
American Rifleman	1
Highlights	1
Hot Rodder	1
Runner	1

Table B7

Summary of Newspapers Mentioned by ORV Riders
on the White Cloud District

NEWSPAPERS	RESPONSE FREQUENCY
Muskegon Chronicle	25
Grand Rapids Press	24
Detroit Free Press	20
Detroit News	12
Holland Sentinel	7
Indianapolis star	4
Big Rapids Pioneer	2
Hillsdale Daily	2
Benton Harbor Herald	1
Grand Haven Tribune	1
Flint Journal	1
Kalamazoo Grazeette	1
Bay City Times	1
Lansing State Journal	1
Saginaw News	1
Traverse City Record Eagle	1
Cadillac Evening News	1
Clare County Clarion	1
Chicago Sun Times	1
Chicago Tribune	1
Royal Oak Tribune	1
South Bend Tribune	1
Elkhart Tribune	1
Wall Street Journal	1
North Adam Gazette	1
Freemont Times	1
Oakland News	1
Jerome Daily Entreprises	1
Oakdale Press	1
Olivetopic	1
The Cassapolis Vigilante	1
Rochester (N.Y.) Times	1
Building Tradesmen	1
Hart Journal	1
Rolling Stone	1
Noblesville Ledger	1

Table B8

List of Club Membership for the ORV Users
on the White Cloud District

Club	Response % (N)
American Motorcycle Association*	60.0 (24)
Cycle Conservation Club of Mich.*	20.0 (8)
National Rifle Association	5.0 (2)
North Ottawa Rod and Gun Club	5.0 (2)
Paradise Motorcycle Club*	2.5 (1)
Michigan Dirt Riders*	2.5 (1)
Michigan United Conservation Clubs	2.5 (1)
Grand Valley Snow Riders*	2.5 (1)
New Boston Sportsmen Club	2.5 (1)
Eagles	2.5 (1)
Total	100.0 (40)

Note: * ORV clubs

Table B9
Sex of Respondents

Sex	% (N)
Male	94.3 (133)
Female	5.7 (8)
Total	100.0 (141)

Table B10
Age of Respondents

Age class	Response % (N)
5 - 9	2.2 (3)
10 - 14	1.4 (2)
15 - 19	7.2 (10)
20 - 24	23.8 (33)
25 - 29	18.7 (26)
30 - 34	20.1 (28)
35 - 39	12.9 (18)
40 - 44	4.3 (6)
45 - 49	2.2 (3)
50 - 54	5.0 (7)
55 - 59	1.4 (2)
60 - 65	0.7 (1)
Total	99.9 (139)

Note: $\bar{X}$ = 29.71; Mode = 21; Median = 28.6.

Table B11
Income of Respondents

%	Income (N)	Response
	-----	-----
\$ 1 - 10,000		11.3 (13)
	-----	-----
\$ 11 - 15,000		27.8 (32)
	-----	-----
\$ 16 - 20,000		22.6 (26)
	-----	-----
\$ 21 - 25,000		6.1 (7)
	-----	-----
\$ 26 - 30,000		11.3 (13)
	-----	-----
\$ 31 - 35,000		4.3 (5)
	-----	-----
\$ 36 - 40,000		1.7 (2)
	-----	-----
\$ 41 - 45,000		2.6 (3)
	-----	-----
\$ 46 - 50,000		1.7 (2)
	-----	-----
\$ 80,000		0.9 (1)
	-----	-----
\$ 95,000		0.9 (1)
	-----	-----
Total		100 (115)
	-----	-----

Note: $\bar{X}$ = \$19,000; Median = 16,670; Mode = 15,000

Table B12
Education of Respondents

Highest Education	Response % (N)
Attended grade school	2.1 (3)
Completed grade school	2.9 (4)
Attended high school	7.1 (10)
Completed high school	39.3 (55)
Attended college	21.4 (30)
Completed college	20.7 (29)
Completed masters	4.3 (6)
Completed Ph.D.	2.1 (3)
Total	100.0 (140)

Table B13
Occupation of Respondents

Occupation	Response % (N)	
Professional & Technical Workers	24.4	(33)
Operatives; factory workers	20.0	(27)
Craftsmen/mechanics	15.6	(21)
Students	9.6	(13)
Self-employed	5.9	(18)
Managers	5.2	(7)
Sales workers	5.2	(7)
Laborers	5.2	(7)
Transportation	4.4	(6)
Housewives	3.0	(4)
Retired	1.5	(2)
Total	100.0	(135)

APPENDIX C

APPENDIX C
CATEGORIZING RESPONSES INTO DIMENSIONS

Responses to various questions were categorized into dimensions so that they could be easily analyzed and similarities between individual responses could be noted. The general description of each dimension follows and Tables C1 to C4 show the individual responses that were placed in each dimension for each question. Multiple answers were weighted equal to a single response.

- 1) What did you least like about this area or trail?
- 2) Why did you choose this site, rather than other sites for ORV recreation?
- 3) What improvements do you feel should be made in this ORV area?
- 4) Please list some of the reasons you enjoy the ORV sport.

For the first two questions above it was determined to divide the answers into the same 8 dimensions. A summary of frequencies of individual responses are found in Table C1 and C2. The first 3 dimensions are all factors dependent upon the ORV area's general land characteristics. The remaining dimensions are attributes dependent upon the ORV user's perceptions of factors other than the land characteristics.

The general-land-characteristics category included 1) man-made features; 2) esthetic features; and 3) land features. The distinction for placing an answer in man-made features was the response mentioned an easily manipulated man-made feature of the trail (i.e. single-lane, marked, or the number trails). Fallen trees was also included in the man-made features since the District commonly fells trees to close an ORV area. The distinctions used for esthetic features were qualities of the trail not tied to physical properties of the terrain such as: a living, growing, aspect of the area (i.e. woods, wildlife); or a general subjective quality of the area (i.e. scenery, wilderness).

The third dimension was land features. It was distinguished by physical characteristics of the geology, and terrain (i.e. sand & hills).

The fourth dimension was convenience. It included answers which referred to the accessibility of the area (i.e. close to home, near work).

The fifth dimension was isolation. It was distinguished by answers which involved 'getting away from it all' or referred to having no people nearby or to the remoteness of the area.

The sixth dimension was other recreation. It refers to the other recreation opportunities available in the area. For instance if the answer the person listed was swimming or camping nearby it would be in this category.

The seventh dimension was social. It included positive attributes related to being with other recreationists, family or friends.

The final eighth dimension was inappropriate. These were answers which were unsuitable or invalid in terms of the question asked. The answers were analyzed to determine if there was a real relationship between the query and the answer. For example 'meet girls' was considered in appropriate because under 8% of the riders are females so it is not a sport conducive to meeting females. Also, when the respondents filled out this question, they indicated it was in reference to meeting female researchers. It was determined in all probability that they do not start riding with this purpose in mind since they would have no way of knowing a female researcher would be at an ORV site.

The above eight dimensions were used for categorizing answers for the question of what the riders liked least about an ORV area. The difference is they were used in the opposite sense. For example, if a rider said that the site was too far away from his home the response was in the convenience dimension (Table C1).

For the improvements question, five categories were developed. Facility improvement is the first category. It includes improvements on the ORV area which involve building or developing some type facility. The second category is communications improvement. Answers included in this category were related to the respondent asking for more information.

The trail features category included all responses that were related to desired improvements of the ORV area or trail (i.e. the number, length, signing). The regulation changes category included any responses that requested an increase or decrease in the rules and regulations governing ORV areas and users.

The last category was no improvements. This is where respondents specifically indicated that they did not desire any changes to the area.

The reasons listed for enjoying ORV riding were consolidated into dimensions (Table C4). The dimensions used were based on Recreation Experience Preference (REP) scales developed by Driver (1977) to quantify the psychological outcomes desired and expected from recreation participation. This study also added two categories: 1) mental change in this study refers to general responses of fun, recreation, and enjoyment; and 2) the dimension "convenience" was added. The convenience dimension included responses that indicated it was the accessibility of the sport or sport area that made it enjoyable.

Drivers' (1977) dimensions were used to quantify this data by revealing the sentence structure of the scales for each dimension and determining if the response given in this study was reasonably close to it.

For example, responses such as skill, competition and self accomplishment were inserted under the dimension of achievement. These corresponded with the following sentences from Driver's work:

Because I thought it would be a challenge (challenge).

To try and improve my skills in doing it (skill).

To show others I could do it (competition).

I thought it would give me a feeling of confidence in myself
(self-achievement).

An inappropriate column was added to include responses that were not categorized into a dimension and non-response. No attempt was made to compare Drivers' results statistically with this studies results. It is felt that the methodology involved in collecting the information was too diverse.

The following is a list of the dimensions with aspects of the scales used to determine them:

Achievement - reinforcing self-image; social recognition; competence testing and seeking stimulation.

Risktaking - risks, danger; uncertainty.

Family togetherness - family togetherness.

Being with people - being with friends or similar people.

Learning-Discovery - general learning and exploratin.

Relationships with Nature - scenery, general nature experience; learn about nature.

Exercise-physical fitness - exercise and physical fitness.

General Escape -

Escape Personal-Social Pressures - tension release, slow down mentally, escape daily routine, and escape perceived pressure;

Escape Physical Pressures - tranquility, seek open space; privacy; escape crowds, and escape physical stressors.

Mental Change - a general category to include fun; enjoyment, entertainment or a state of mind change that occurs because of the activity.

Inappropriate - answers which could not be categorized into the above dimensions and non-response.

Table C1
The Least-liked Attributes of ORV areas
on the White Cloud District

DIMENSION	RESPONSE	NUMBER OF RESPONSES ¹					
		ENDURO RIDERS % (N)	TRAIL RIDERS ON-SITE % (N)	CAMPER % (N)	DUNEBUGGY & 4x4'ERS % (N)	TOTAL % (N)	
LAND FEATURES	Flat	(0)	14.9 (11)	(0)	(0)	7.2 (11)	
	Mud Holes	20.8 (0)	(0)	(0)	(0)	6.5 (10)	
	Bumps	2.1 (1)	8.1 (6)	(0)	(0)	4.6 (7)	
	Water	6.3 (3)	1.4 (1)	5.9 (0)	(0)	3.3 (5)	
	Gullies	2.1 (1)	1.4 (1)	(0)	(0)	1.3 (2)	
	Hills	(0)	1.4 (1)	(0)	(0)	0.7 (1)	
	Dry	(0)	1.4 (1)	(0)	(0)	0.7 (1)	
	Total	31.3 (15)	28.4 (21)	5.9 (1)	(0)	24.2 (37)	
MANMADE FEATURES	Felled Trees	22.9 (11)	(0)	35.3 (6)	7.1 (1)	11.8 (18)	
	Closed Trails	(0)	5.4 (4)	(0)	(0)	2.6 (4)	
	Rangers	6.3 (3)	(0)	(0)	(0)	2.0 (3)	
	Access	(0)	2.7 (2)	(0)	(0)	1.3 (2)	
	Trail Marking	2.1 (1)	1.4 (1)	5.9 (1)	14.3 (0)	2.6 (4)	
	Short Trails	(0)	2.7 (2)	(0)	(0)	1.3 (2)	
	Not One-way Trails	2.1 (1)	1.4 (1)	(0)	(0)	1.3 (2)	
	Wide Trails	(0)	1.4 (1)	(0)	(0)	0.7 (1)	
	Road Crossing	(0)	1.4 (1)	(0)	(0)	7.1 (1)	
	Regulations	2.1 (1)	(0)	(0)	(0)	0.7 (1)	
	No Maps	(0)	1.4 (1)	(0)	(0)	0.7 (1)	
	Total	35.4 (17)	17.6 (13)	41.2 (0)	28.6 (0)	26.8 (41)	
Subtotal		66.7 (32)	45.9 (34)	47.1 (8)	28.6 (4)	51.0 (78)	
Pg. 1							

Table C1 (cont'd)

DIMENSION	RESPONSE	NUMBER OF RESPONSES ¹									
		ENDURO RIDERS		TRAIL RIDERS ON-SITE		CAMPER		DUNEBUGGY & 4x4'ERS		TOTAL	
		%	(N)	%	(N)	%	(N)	%	(N)	%	(N)
SOCIAL	Cars & 4x4's	10.4	(5)		(0)	5.9	(1)		(0)	3.9	(6)
	Other Rider		(0)	4.1	(3)	5.9	(1)	7.1	(1)	3.3	(5)
	Other People	2.1	(1)		(0)	11.8	(2)		(0)	2.0	(3)
	Equestrians		(0)	1.4	(1)		(0)	7.1	(1)	1.3	(2)
	Total	12.5	(6)	5.4	(4)	23.5	(4)	14.3	(2)	10.5	(16)
CONVENIENCE	Far From Home		(0)	4.1	(3)		(0)		(0)	2.0	(3)
ESTHETICS	Logged Areas		(0)	1.4	(1)		(0)		(0)	0.7	(1)
ISOLATION			(0)		(0)		(0)		(0)		(0)
OTHER RECREATION			(0)		(0)		(0)		(0)		(0)
INAPPRO- PRIATE	Bugs		(0)	4.1	(3)		(0)		(0)	2.0	(3)
	Wire & Glass		(0)		(0)	11.8	(2)		(0)	1.3	(2)
	Nonresponse	20.8	(10)	39.2	(29)	17.6	(3)	57.1	(8)	32.7	(50)
	Total	20.8	(10)	43.2	(32)	29.4	(5)	57.1	(8)	35.9	(55)
	Subtotal Pg. 2	33.3	(16)	54.1	(40)	52.9	(9)	71.4	(10)	49.0	(75)
	Subtotal Pg. 1	66.7	(32)	45.9	(34)	47.1	(8)	28.6	(4)	51.0	(78)
	Total	100	(48)	100	(74)	100	(17)	100	(14)	100	(153)

¹ Number of respondents giving the corresponding answer. Multiple answers equal a single response. Total subject size was 144 with 94 respondents and 50 non-respondents.

Table C2

Why Trail Riders Chose to Use ORV Areas

DIMENSION	RESPONSE	NUMBER OF TRAIL RIDERS ¹	
		%	(N)
CONVENIENCE	Near Home	24.1	(26)
	Near Vacation	1.9	(2)
	Home		
	Near Job	1.9	(2)
	Near Vacation	1.9	(2)
	In-Route	0.9	(1)
	Near Relative	0.9	(1)
	Total	31.5	(34)
MANMADE FEATURE	Expert Trails	8.3	(9)
	Marked Trails	5.6	(6)
	Many Trails	5.6	(6)
	Parking	2.8	(3)
	Tight Turns	1.9	(2)
	New Trails	1.9	(2)
	Loop Trails	0.9	(1)
	Long Trails	0.9	(1)
	Fast Trails	0.9	(1)
	No Enforcement	0.9	(1)
	Total	29.6	(32)
	Subtotal Pg. 1	61.1	(66)

¹ Number of respondents giving the corresponding answers. Multiple answers equal a single response. Enduro riders were not asked this question since the race site was chosen by the race organizer and campers were not asked since they were not riding. Total subject size was 86 with 73 respondents and 13 non-respondents.

Table C2 (cont'd)

DIMENSION	RESPONSE	NUMBER OF TRAIL RIDERS ¹	
		%	(N)
LAND FEATURE	Variety	4.6	(5)
	Hills	5.6	(6)
	Mud Holes	0.9	(1)
	Jumps	0.9	(1)
	Sand	0.9	(1)
	Total	13.0	(14)
SOCIAL	With Family	1.9	(2)
	With Friends	1.9	(2)
	Other People	0.9	(1)
	Total	4.6	(5)
OTHER RECREATION	Beach	2.8	(3)
	Camping	1.9	(2)
	Total	4.6	(5)
ISOLATION	Few People	2.8	(3)
ESTHETICS	Nice Area	1.9	(2)
NONRESPONSES		12.0	(13)
	Subtotal Pg. 2	38.9	(42)
	Subtotal Pg. 1	61.1	(66)
	Total	100	(108)

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See note on first Page.

Table C3

Improvements Desired by ORV Users
on the White Cloud District

DIMENSION	RESPONSE	NUMBER OF RESPONSES ¹					
		ENDURO RIDERS % (N)	TRAIL RIDERS ON-SITE % (N)	CAMPER % (N)	DUNEBUGGY & 4x4'S % (N)	TOTAL % (N)	
TRAIL FEATURE	More Trails	35.6 (16)	8.5 (7)	5.9 (1)	6.7 (1)	15.7 (25)	
	More Marking	11.1 (5)	3.7 (3)	23.5 (4)	26.7 (4)	10.1 (16)	
	One-way Trails	2.2 (1)	6.1 (5)	17.6 (3)	13.3 (2)	6.9 (11)	
	Wider Trails	(0)	6.1 (5)	5.9 (1)	(0)	3.8 (6)	
	Remove Bumps	(0)	6.1 (5)	(0)	(0)	3.1 (5)	
	Less Pavement	2.2 (1)	3.7 (3)	(0)	(0)	2.5 (4)	
	Remove Blockades	(0)	3.7 (3)	(0)	(0)	1.9 (3)	
	More Hills	(0)	3.7 (3)	(0)	(0)	1.9 (3)	
	Longer Trails	(0)	1.2 (1)	(0)	(0)	0.6 (1)	
	Move Trail	(0)	(0)	5.9 (1)	(0)	0.6 (1)	
Total		51.1 (23)	42.7 (35)	58.8 (10)	46.7 (0)	47.2 (75)	
FACILITY IMPROVEMENT	Rest Room	(0)	6.1 (5)	(0)	(0)	3.1 (5)	
	Better Access	2.2 (1)	1.2 (1)	(0)	13.3 (2)	2.5 (4)	
	Potable Water	(0)	2.4 (2)	(0)	(0)	1.3 (2)	
	Total	2.2 (1)	9.8 (8)	(0)	13.3 (0)	6.9 (11)	
REGULATION CHANGES	Remove Govern- ment Control	6.7 (3)	(0)	(0)	(0)	1.9 (3)	
	All Trails Open Except Posted Ones	4.4 (2)	(0)	(0)	(0)	1.3 (2)	
	Cycle Only Trails	2.2 (1)	(0)	5.9 (1)	(0)	1.3 (2)	
	ORV-only Camps	(0)	1.2 (1)	5.9 (1)	(0)	1.3 (2)	
	Total	13.3 (6)	1.2 (1)	11.8 (2)	(0)	5.7 (9)	
	No Improvements	4.4 (2)	18.3 (15)	(0)	6.7 (1)	11.3 (18)	
COMMUNICA- TION IMPROVEMENT	Make Maps	(0)	4.9 (4)	(0)	(0)	2.5 (4)	
	Post Maps	(0)	1.2 (1)	(0)	(0)	0.6 (1)	
	Total	(0)	6.1 (5)	(0)	(0)	3.1 (5)	
Nonresponse		28.9 (0)	22.0 (18)	29.4 (5)	33.3 (5)	25.8 (41)	
Total		100 (45)	100 (82)	100 (17)	100 (15)	100 (159)	

¹ Number of respondents giving the corresponding answer. Multiple answers equal a single response. Total subject size was 144 with 103 respondents and 41 non-respondents.

Table C4
Reasons Why White Cloud ORV
Users Enjoy the ORV Sport

DIMENSION	RESPONSE	NUMBER OF RESPONSES ¹					
		ENDURO RIDERS		TRAIL RIDERS ON-SITE		CAMPER	
		%	(N)	%	(N)	%	(N)
EXPERIENCE NATURE	Natural Beauty	9.7	(7)	12.6	(20)	9.4	(3)
	Out-Of-Doors	6.9	(5)	8.2	(13)	3.1	(1)
	Camping	1.4	(1)	3.1	(5)	(0)	(0)
	Hiking & Swimming		(0)	0.6	(1)	(0)	(0)
	Fishing & Canoeing		(0)	0.6	(1)	(0)	(0)
	Sight-Seeing	1.4	(1)		(0)	(0)	(0)
	Total	19.4	(14)	25.2	(40)	12.5	(4)
MENTAL CHANGE	Fun Enjoyment						
	Entertainment	5.6	(4)	18.2	(29)	12.5	(4)
	Recreation		(0)		(0)	3.1	(1)
	Feel Young		(0)		(0)	3.1	(1)
	Total	5.6	(4)	18.2	(29)	15.6	(5)
ACHIEVEMENT	Challenge	6.9	(5)	6.3	(10)	9.4	(3)
	Exciting	5.6	(4)	1.9	(3)	(0)	(0)
	Competition	8.3	(6)		(0)	(0)	(0)
	Self- Accomplishment	4.2	(3)		(0)	(0)	(0)
	Skill	1.4	(1)	1.3	(2)	3.1	(1)
	Total	26.4	(19)	9.4	(15)	12.5	(4)
GENERAL ESCAPE	Escape Remote	6.9	(5)	9.4	(15)	6.3	(2)
	No Crowds						
	Peaceful	2.8	(2)	(0)	(0)	(0)	(0)
	Freedom	4.2	(3)	(0)	(0)	(0)	(0)
	Total	13.9	(10)	9.4	(15)	6.3	(2)
	Subtotal Pg. 1	65.3	(47)	62.3	(99)	46.9	(15)
						61.2	(161)

Table C4 (cont'd)

DIMENSION	RESPONSE	NUMBER OF RESPONSES ¹					
		ENDURO RIDERS % (N)	ON-SITE % (N)	TRAIL RIDERS CAMPER % (N)	TOTAL % (N)		
TENSION RELEASE	Tension Release	2.8 (2)	5.0 (8)	9.4 (3)	4.9 (13)		
	Relax	8.3 (6)	3.1 (5)	6.3 (2)	4.9 (13)		
	Total	11.1 (8)	8.2 (13)	15.6 (5)	9.9 (26)		
EXERCISE	Exercise	9.7 (7)	5.7 (9)	15.6 (5)	8.0 (21)		
FAMILY TOGETHERNESS	Family- Friendship	2.8 (2)	3.1 (5)	6.3 (2)	3.4 (9)		
RISK	Speed	1.4 (1)	3.8 (6)	3.1 (1)	3.0 (8)		
BEING WITH OTHERS	Friendship	1.4 (1)	3.1 (5)	3.1 (1)	2.7 (7)		
CONVENIENCE	Something to Do	(0)	1.9 (3)	(0)	1.1 (3)		
	Near Home	1.4 (1)	(0)	(0)	0.4 (1)		
	In Route	(0)	0.6 (1)	(0)	0.4 (1)		
	Total	1.4 (1)	2.5 (4)	0 (0)	1.9 (5)		
DISCOVER	New Sport	(0)	0.6 (1)	(0)	0.4 (1)		
	Adventure	(0)	0.6 (1)	(0)	0.4 (1)		
	Total	0 (0)	1.3 (2)	0 (0)	0.8 (2)		
DOMINANCE CONTROL	Feel in Control of Life	0 (0)	0.6 (1)	0 (0)	0.4 (1)		
INAPPROPRIATE	Loves Off Road Cycling	(0)	3.1 (5)	3.1 (1)	2.3 (6)		
	Only Legal Way to Ride	(0)	0.6 (1)	(0)	0.4 (1)		
	Nonrespondents	6.9 (5)	5.7 (9)	6.3 (2)	6.1 (16)		
	Total	6.9 (5)	9.4 (15)	9.4 (3)	8.7 (23)		
Subtotal Pg. 2		34.7 (25)	37.7 (60)	53.1 (17)	38.8 (102)		
Subtotal Pg. 1		65.3 (47)	62.3 (99)	46.9 (15)	61.2 (161)		
Total		100 (72)	100 (159)	100 (32)	100 (263)		

¹ Number of respondents giving the corresponding answer. Multiple answers equal a single response. Total subject size was 144 with 128 respondents and 16 non-respondents. Trail riders include 4x4 'ers and dune buggiers.

BIBLIOGRAPHY

BIBLIOGRAPHY

- Banzhaf, George & Company. 1974. U.S. Forest Survey for Use of Off-Road Vehicles. Milwaukee, Wisconsin.
- Berelson, Bernard and Gary A. Steiner. 1965. Human Behavior, An Inventory of Scientific Findings. Harcourt, Brace & World, New York, New York.
- Berkman, Harold W., and Christopher C. Gilson. 1978. Consumer Behavior: Concepts and Strategies Dickenson Publishing Company, Inc. Encino, California.
- Bury, Richard L. and E.R. Fillmore. 1974. Design of Motorcycle Areas Near Campgrounds: Effects on Riders and Non-Riders Department of Recreation and Parks Technical Department Report No. 6. Texas A & M University. College Station, Texas.
- Bury, Richard L., Robert C. Wendling & Stephen F. McCool. 1976. Off-Road Recreation Vehicles: A Research Summary 1969-1975. Texas Agricultural Experiment Station & Texas A & M University System. College Station, Texas.
- Chandler, Stephen. 1980. "U.S. Forest Service Interdepartment Memo-Problems with ORV Management". Unpublished manuscript. Huron-Manistee National Forests, USDA Forest Service. Cadillac, Michigan.
- Chilman, Kenneth C. 1978. Profile - The Trailbiker. In: Proceedings of the Great Lakes Recreational Trail Biker Workshop. Black River Falls, Wisconsin p. 4. Planning for Trailbike Recreation. Heritage Conservation and Recreation Service, USDI GPO. 853-177, p.82.
- Christensen, Harriet and Roger N. Clark. 1978. Understanding and controlling vandalism and other rule violations in urban recreation areas. Paper presented at National Urban Forestry Conference, Washington D.C., November.
- Clark, R.N., J.C. Hendee, and F.L. Campbell. 1971. Depreciative Behavior in Forest Campgrounds: An Exploratory Look. USDA Forest Service Research Note PNW-161. Pacific-Northwest Experiment Station. Fort Collins, Colo.

- Dabb, Jim. 1981. Law Enforcement Officer, Michigan Department of Natural Resources. Personal Communication.
- Davey, Stuart P. & Neil J. Stout. 1976. Priority Needs in Outdoor Recreation Research. In: Proceedings of the Southern States Recreation Research Applications Workshop. USDA F.S. Technical Report SE-9, Southeastern Forest Experiment Station, Asheville, N.C.
- Driver, B.L. 1977. Item pool for scales Designed to Quantify the psychological outcomes desired and expected from Recreation Participation. Unpublished PNW Exp. Sta. Fort Collins, Colo.
- Emetaz, Roland. 1978. Land Managers Views of Trail Bike Recreation It's a Matter of Attitude. In: Proceedings of the Great Lakes Recreational Trail Bike Workshop. Black River Falls, Wisconsin.
- Engel, James F., Roger D. Blackwell, and David T. Kollat. 1978. Consumer Behavior. The Dryden Press.
- Hovland, Carl I., L. Janis Irving and Harold H. Kelly. 1953. Communication and Persuasion, Yale University Press, Birmingham, N.Y.
- Hronek, Bruce B. 1968. Results of Intensified Law Enforcement in Urban Oriented National Forest Recreation Areas. Unpublished report. Ogden Ranger District, Wasatch National Forest Report, Intermountain Region. Ogden, Utah.
- Fishbein, Martin. 1967. Readings in Attitude Theory and Measurement. John Wiley and Sons. New York, New York.
- James, George A. and Thomas Ripley. 1963. Instructions for using traffic counters to estimate recreation visits and use. Service Res. Pap. SE-3, Southeastern Forest Exp. Sta., U.S. Forest Service, Asheville, N.C.
- James, George A. 1966. Estimating Recreation Use on a Complex of Developed Sites. U.S. Forest Service Res. Note SE-64. Southeastern Forest Exp. Sta., Asheville, N.C.
- James, George A. 1971. Inventory Recreation Use. In: Proceedings of the Southern States Recreation Research Applications Workshop. USDA F.S. Technical Report SE-9, Southeastern Forest Experiment Station, Asheville, N.C.
- Johnson, P., B. Kennedy, J. Meisenback and R. Rawlings. 1974. Off-Highway Vehicle Registrants - A Survey of Their Interests and Activities. In Rec. Tip No. 7. California Resources Agency. In: Proceedings of Southern States Recreation Research Workshop, USDA F.S. Technical Report SE-9, Southeastern For. Exp. Sta., Asheville, N.C.

- Joiner, Gordon 1979. Sociological Investigation Characterizing the Human Resources of the White Cloud Ranger District, Huron Manistee National Forests. Unpublished report. Huron-Manistee National Forests, USDA Forest Service, Cadillac, Michigan.
- Joiner, Gordon 1980. Unpublished report. Illegal ORV use on the White Cloud District. Unpublished report. Huron-Manistee National Forest, USDA Forest Service, Cadillac, Michigan.
- Joiner, Gordon 1980. District Ranger USDA Forest Service. Personal Communication. June.
- Knopf, R.C. 1972. Motivational Determinants of Recreation Behavior. As cited In: Driver, B.L. 1976. Towards a better understanding of the social benefits of Outdoor recreation participation. In: Proceedings of the Southern States Recreation Research Applications Workshop. USDA F.S. Technical Report SE-9, Southeastern Forest Experiment Station, Asheville, N.C.
- LeValley, Charles L. 1978. Management and Enforcement of ORV Users. In proceedings of 1978 Great Lakes Trail Bike Workshop, Black River Falls, Wisconsin.
- Lockhart, Robert. 1980. Recreation Staff Officer. USDA Forest Service. Personal Communication. June.
- McCurdy, Dwight R. 1970. "Recreationists' Attitudes Towards User Fees: Management Implications." Journal of Forestry, 68: 645-646.
- McElwain, Frank. 1970. Third year results of intensified Law Enforcement in Urban Oriented National Forest Areas Ogden Ranger District. Unpublished manuscript. Wasatch National Forest Report. Intermountain Region. Ogden, Utah.
- McElwain, Frank and Bruce Hronek. 1969. Second year results of intensified Law Enforcement in Urban Oriented National Forest Areas Ogden Ranger. Unpublished manuscript. Wasatch National Forest Report. Intermountain Region. Ogden, Utah.
- Michigan Department of Natural Resources Recreation. 1977. Analysis of recreation participation and public opinion on ORV's from 1976 Telephone Survey. Recreation Planning Section Survey Report #1. Lansing, Michigan.
- Michigan Department of Natural Resources. 1980. Michigan's Off-Road Vehicle Guide. Lansing, Michigan.
- Michigan Department of Natural Resources. 1976. Recreation Planning Section Report Number 3. Lansing, Michigan, p. 11.

- Michigan, State of 1975. State Legislature House Bill 4729, Act. Number 319. "An Act to provide legislation and regulation of off-road recreation vehicles and to provide penalties". Lansing, Michigan.
- Motorcycle Industry Council, Inc. 1978. 1978 Motorcycle Statistical Annual. Newport Beach, California.
- Ray, Micheal L. 1973. Marketing Communication. In: New Models for Mass Communication Research, Peter Clark (ed). Sage Publications, Beverly Hills, Calif. pp. 147-177.
- Robertson, Marc. D. and Richard O. Bishop. 1975. Off Road Recreation Vehicles in the Upper Great Lake States: User Characteristics and Economic Impacts. University of Wisconsin, Madison, Wisconsin.
- Ross, T.L. and G.H. Moeller. 1974. Communicating Rules in Recreation Areas. USDA Forest Service Res. Pap. NE-297 Northeastern For. Exp. Sta. Upper Darby, Pa.
- Smith, Stephen L., Richard Nuxoll and Fred Galloway. 1976. Survey research for Community Recreation Services. Agric Exp. Sta. Res. Rpt. 291, M.S.U. East Lansing, Michigan.
- Sommer, Robert and Barbara Sommer. 1980. A Practical Guide to Behavioral research: Tools and Techniques. Oxford University Press, N.Y., N.Y.
- Turnbull, Arthur T. and Russell N. Baird. 1968. The Graphics of Communication. Holt, Rinehart, and Winston, Inc., Chicago, Ill. pp. 183-210.
- U.S. Department of Agriculture Forest Service. 1978. Allegheny National Forest, Dispersed Measurement Techniques. Unpublished manuscript. Allegheny National Forest, Warren, Pa.
- U.S. Government Department of Agriculture, Forest Service. 1976a. Huron-Manistee National Forest Land Managers Report, Unpublished manuscript, Cadillac, Michigan.
- U.S. Department of Agriculture, Forest Service. 1976b. Order of the Forest Supervision Restricting the use of Off-Road Vehicles on the Huron-Manistee National Forest. Unpublished manuscript. Huron-Manistee National Forest, Cadillac, Michigan.
- U.S. Department of Agriculture Forest Service. 1978. Managers Report Huron-Manistee National Forest, Cadillac, Michigan.
- U.S. Government Department of Agriculture Forest Service. 1979. ORV Information and Education Action Plan. Unpublished manuscript. Cadillac, Michigan.

Upper Great Lakes Regional Commission. 1972. Model Legislation Off-Road Recreational Vehicles. Minneapolis, Minnesota.

Wagar, Alan. 1971. Communicating with recreationists. USDA Forest Service NE For. Exp. Sta. Recreation Symposium Proceedings. Northeastern Forest Experiment Station. Upper Darby, Pa.

Wendling, Robert. 1976. The Influence of Managerial Attitudes on Allocation of Federal Lands for Off-road Motorcycling. Unpublished Manuscript. Texas A & M University. College Station, Texas.



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