OFF-ROAD VEHICLE USER KNOWLEDGE OF ENVIRONMENTAL IMPACT IN SELECTED USE AREAS

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Submitted to the Faculty of the
Graduate College of the
Oklahoma State University
in partial fulfillment of
the requirements for
the Degree of
DOCTOR OF EDUCATION
May, 1991

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ACKNOWLEDGEMENTS

I have appreciated the guidance and help of all my committee members throughout my studies at Oklahoma State University. A large part of my success is directly due to Dr. Lowell Caneday's guidance. An individual could not have a better advisor. I would also like to thank Dr. Christine Cashel, Dr. Steven Edwards, and Dr. Thomas Karman, who served as members of my doctoral committee. I appreciate your time and effort.

I am truly thankful for my parents, Earl and Louise Reynolds. Without their love, support, and patience, none of this would have been possible. They have very obviously shared and fostered the belief that I could succeed in this endeavor. Throughout the entire process, they offered much needed affirmation. Many times when I was not sure that I would be able to complete my studies, they were there with a helping hand and a loving word. I love you two very much.

I have recognized the importance of family members through the course of obtaining this degree. Special thanks to Dianne, Roger, Rick, Nancy, Fred, Kim, Betty Jo, and Doug, who have given freely their love and encouragement. Thanks also to Natalie, Nicholas, Luke, Zak, and Allison, who have given me much to think about.

A large number of friends have supported and encouraged me during my graduate studies. Thanks to Ty, Teed, David, Letty, and all the others. A big thanks to James Hesketh for his help in coding the data. Of course, thanks to Amy, you always have my love and support. My proofreaders deserve a pat on the back. They made a large contribution to the style and form of the paper.

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CHAPTER I

THE RESEARCH PROBLEM

Introduction

There are over ten million off-road vehicles (ORVs) in the United States. The number of Americans who use these vehicles is more than forty million. Each year the number of vehicles and the number of users increase.[1] By 1985, over one million dirt bikes were estimated to be in Oklahoma alone; dune buggies, four-wheel drives, and other off-road vehicles were not included in the estimate. The numbers for all of these vehicles are increasing every year.[2]

Off-road vehicles have been used off paved roads since the beginning of the century. Not until the 1960s was there a need to oversee the use of these vehicles by land managers. Land managers are required to decide who will use the land, how the land is to be used, and where the vehicles may be used on managed lands. The process of deciding is complicated:

> Decisionmaking is difficult in ORV management because the activity represents a complex interface among (1) people's attitudes, preferences, and behavior; (2) environmental factors such as land use and effects of ORV traffic on soils, vegetation, and animals; and (3) machine-related aspects such as vehicle type, engine size, and type of tires.[3]

A substantial amount of research has shown that ORVs can accelerate erosion, remove vegetation, destroy animal habitats, and have other harmful effects on the environment. Other than demographic information on ORV users, little research has been conducted about the ORV users themselves. Since ORV use has become a factor in the land management decision-making process for both public and private land managers, information is necessary about those who use ORV areas. If the managers know more about the individuals' characteristics who use the areas, more effective management decisions could result.

Need for the Study

The majority of research conducted on off-road vehicle (ORV) use and their users has focused on the impact the vehicles have on the environment. Little is know about the users themselves. Although there is some information about the demographics of ORV users, the research is limited on the ORV users' knowledge, attitudes, and values.

There is a lack of research into ORV users' perceptions or knowledge of the impact that their vehicle cause. McCool and Roggenbuck, therefore, outlined seven areas for study:

1. How concerned and perceptive are ORV users about the impact of their machines upon the environment?
2. Are unorganized ORV users less concerned about environmental impacts than organized user groups?

3. How much of the impact of ORVs upon the environment is inevitable, and how much is due to user ignorance and/or callousness?

4. What are the attitudes of ORV users toward the environment?

5. To what extent is environmental awareness among ORV users increasing?

6. What percent of all ORV users misuse the land and violate regulations?

7. What causes certain ORV users to heavily impact the land, to create social conflicts and to violate regulations?[4]

This study was designed to help answer questions one, two, and four, and possibly, lay groundwork to answer question five.

Therefore, the need for this study is to: (1) expand the knowledge base of research on the subject of off-road vehicle users; (2) assist those who manage ORV users and ORV areas to better understand who the ORV users are; (3) identify ORV users' knowledge base on the environmental impact of ORVs; (4) identify ORV users' opinions whether adverse environmental impact caused by their vehicles is an acceptable consequence; and, (5) identify ORV users' opinions whether management of ORV use areas should be paid by ORV users.

Purposes of the Study

This study was designed to ascertain ORV users', in Oklahoma, knowledge of ORVs' impact upon the environment; identify their opinions as to whether an adverse impact upon the environment is an acceptable consequence of ORV use;

and, identify their opinions whether management of ORV use areas should be paid for by the ORV users. Other purposes are included in this study to address the respondents' knowledge and opinions.

The specific purposes of this study were:

1. To identify if the ORV users as a group, at selected sites in Oklahoma, have knowledge that ORVs have an impact upon the environment.

2. To identify what opinions ORV users as a group, at selected sites in Oklahoma, have toward whether adverse impact upon the environment is an acceptable consequence of ORV use.

3. To identify which specific demographics have a relationship to the ORV users' knowledge of ORV impact upon the environment.

4. To identify which specific demographics have a relationship to ORV users' opinions as to whether adverse impact upon the environment is an acceptable consequence of ORV use.

5. To identify those demographics that would characterize the users of ORVs in Oklahoma.

6. To identify ORV users' opinions, at selected sites in Oklahoma, on whether management of ORV use areas should be paid by ORV users.

7. To identify which specific demographics have a relationship to whether management of ORV use areas should be paid by ORV users.

Of these purposes, the emphases of this study were to identify whether or not ORV users at Oklahoma ORV sites have a knowledge that ORVs cause an impact upon the environment; whether or not the ORV users themselves believe that an adverse impact is an acceptable consequence of their behavior; and whether or not the ORV users believe that management of these areas should be paid by the ORV users themselves.

Statement of the Problem

The purposes of this study focused on central questions of ORV users' knowledge, at selected Oklahoma sites, of environmental impact by ORVs; if the ORV users believed that an adverse impact upon the environment is an acceptable consequence of ORV use; and whether or not management of an ORV use area should be paid by ORV users. Also, did demographics have an effect on ORV users' knowledge of an ORV's impact upon the environment; did demographics have an effect on whether ORV users agree or disagree that an acceptable consequence of ORV use is adverse impact upon the environment; and did demographics have an effect on whether or not ORV users believed that management of specific ORV use areas should be paid by the ORV users?

Therefore, the following questions were addressed by the research instrument and the results were measured:

1. Do users of ORVs in Oklahoma have knowledge that ORVs have an impact upon the environment at areas in which the vehicles are used?

2. Do users of ORVs in Oklahoma agree or disagree that an acceptable consequence of ORV use is an adverse impact upon the environment?

3. Do users of ORVs in Oklahoma agree or disagree that management of the specific ORV use areas should be paid by the ORV users?

The following null hypotheses were developed:

Ho_1: There is no significant difference of knowledge of ORV impact upon the environment regardless of, date of survey, time of survey, location of survey, gender, passenger or driver of the ORV, type of ORV vehicle used, age, race/ethnicity, employment status, years of formal education, years operating an ORVs, membership in an organized ORV club, or household income.

Ho_2: There is no significant difference in acceptance of consequence of the adverse effect of ORV use impact upon the environment, regardless of the demographics in Ho_1.

Ho_3: There is no significant difference of ORV users' opinions as to whether ORV users should pay for management of specific ORV use areas, regardless of the demographics in Ho_1.

Limitations of the Study

This study was limited by several factors. First, the length of the sampling procedure was limited. Because of the restricted amounts of funds, on-site surveys were conducted from April 11, 1988 to June 11, 1988. Although the winter months may not have produced sufficient respondents, other dates in the summer months may have produced a larger sample. A random sample of dates during the period selected should minimize any limitation on time of year.

Second, the study was limited to the number of sites that could be cost-effectively sampled. If every site that could be found was selected, the cost of such an undertaking would be prohibitive. However, the sites that were surveyed, should represent a cross-section of ORV use sites, thus reducing this limitation.

Third, this study was limited to eight ORV sites. To identify every ORV use area would be difficult. While some additional sites could have been identified through local ORV clubs, there might be many sites used by ORV users whose location would be known only to those users. Therefore, only sites identified in the American Motorcyclist Association's publication, Trail Riding In America,[5] were selected for this study. The areas that were identified in the publication, may represent only a certain population of the ORV users in Oklahoma. Some ORV users may prefer areas

that are frequented by others that share their same interests, while some may prefer to recreate by themselves.

Fourth, this study was limited to the State of Oklahoma. ORV sites in Oklahoma may not be representative of the rest of the nation. The sites selected were in metropolitan and rural areas, and were in sites extensively and seldomly used. Although the sample population may not represent the entire United States, the sample may represent both rural and urban populations.

Fifth, the data gathering instrument (questionnaire) was developed by the researcher. Since there was no existing comparable instrument, the reliability of the data gathering instrument was limited. Reliability is best indicated by repetition, but repetition was not part of this study. Statistical analysis was applied to test for reliability.

Sixth, generalizations drawn from this study can be applied only to those ORV users in Oklahoma. This may serve as a point of departure for similar studies in other states. It is recognized that the ORV user in Oklahoma may not be a State of Oklahoma resident.

Seventh, this study was also limited by the effect of time because peoples' knowledge and opinions change. Education, mass media, and economics could affect an individual's knowledge and opinions over time. Even though exposure to new information may occur, however quickly or slowly, individual opinions may not change very rapidly.

Eighth, this study was limited to only those responding to the questionnaire. Those responding may have a different knowledge base or opinions from the remainder of the ORV population. Also, those who refused to respond to the questionnaire may represent a separate population of ORV users. Random sampling of the possible subjects should reduce this and the previous limitations.

Ninth, the conclusions of the literature reviewed, particularly on the effects of ORV use on the environment, are a limitation of this study. The conclusions of the literature provided the foundation for the assessment instrument and may need reevaluation or may result in reinforcement as future research accumulates. The diversity, quality, and amount of the literature reviewed should minimize this limitation.

Assumptions of the Study

It was assumed that the subjects who responded to the questionnaire will be representative of the population of users at Oklahoma's ORV sites. Such an assumption was based upon the premise that random sampling from a population will produce a representative sample.

The assumption was made that a representative sample was drawn from the population of ORV users from the dates of April 11, 1988 to June 11, 1988. Again, this assumption was based upon the premise that random sampling will produce a representative sample.

It was assumed that an appropriate way to identify subjects' demographics, to measure their knowledge of ORV impact on the environment, to gauge their opinions as to whether adverse impacts of ORV use on the environment is an acceptable consequence, and to measure their opinions as to whether management of ORV use areas should be paid for by ORV users, was through a questionnaire. Also, it was assumed that the subjects' knowledge and their opinions can be measured by a questionnaire.

It was assumed that the respondents were willing to respond to a questionnaire, and that they answered the questionnaire honestly, thereby reflecting their true knowledge and opinions.

Delimitations of the Study

This study was targeted to study Oklahoma ORV users. Every Oklahoma site listed in the American Motorcyclist Association's publication Trail Riding in America (1982)[6] was selected. Therefore, a total of eight sites were chosen including two locations at one of those sites. These eight sites all are managed by governmental agencies and are particularly applicable for study by public land managers.

Definition of Terms

Off-road vehicles (ORV): " . . . motorized vehicles which travel off-road for recreational purposes - motorcycles of various sorts (mini-bikes, dirt bikes,

enduros, motorcross bikes, etc.), four-wheel drive vehicles such as Jeeps, Land Rovers, or pickups, . . . dune buggies, and all-terrain vehicles."[7] Snowmobiles are not considered in this study because of the limited use of such vehicles in Oklahoma.

Off-road vehicle use areas: Areas maintained and managed for the use of ORVs. In this study, the sites were managed by a governmental agency (city, state, or federal).

All-terrain vehicle (ATV): An ORV that was designed to be used for off-roads, and which only can be used legally off-roads.

Cohorts: A group of respondents who exit the ORV area together.

ENDNOTES

[1]David Sheridan, Off-Road Vehicles on Public Lands, Council on Environmental Quality (Washington, D.C.: Government Printing Office, 1979), pp. 2-3.

[2]Oklahoma Tourism and Recreation Department, Oklahoma Motorcycle- ORV Areas (Oklahoma City: Division of Marketing Services, June 1985), p. 9.

[3]Richard L. Bury, Robert C. Wendling, and Stephen F. McCool, Off-Road Recreation Vehicles--A Research Summary, 1969-1975 (Texas Agriculture Experimental Station: Texas A & M University, June 1976), p. 1.

[4]Stephen F. McCool and J. W. Roggenbuck, Off-Road Vehicles and Public Land: A Problem Analysis, vol. 2 (Logan, Utah: Department of Forestry and Outdoor Recreation and Institute for the Study of Outdoor Recreation and Tourism, College of Natural Resources, Utah State University, 1974), pp. 22-25; quoted in Richard L. Bury, Robert C. Wendling, and Stephen F. McCool, Off-Road Recreation Vehicles--A Research Summary, 1969-1975 (Texas Agriculture Experimental Station: Texas A & M University, June 1976), p. 21.

[5]Trail Riding In America (Westerville, Ohio: American Motorcyclist Association, 1982), pp. 33-34.

[6]Ibid.

[7]Sheridan, p. v.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

A literature review was conducted on off-road vehicle use and users. This review included the environmental effects of ORV use, ORV users' social demographics and their knowledge of environmental effects, and conflicts with non-ORV users. In addition, the literature was reviewed relating to the research design and the development of the data collection instrument used in this study.

Literature Related to the Environmental Effects of Off-Road Vehicle Use

Off-road vehicles (ORVs) have an impact on all segments of the environment. ORV use causes soil erosion, compaction, and general degradation. ORVs can remove vegetation from the soil or the vegetation can be lost by soil erosion. Sand dunes can lose vegetation and suffer degradation. Water environments (ponds, lakes, streams, and rivers) are damaged because ORV use adds to the silting process, to the leaking of oil and gas into the water, or to direct impacts upon the environments. Air can be polluted by ORV exhaust fumes. All environmental impacts of ORV use may affect the

wildlife. Wildlife loses vegetation for food and cover; their water can become polluted or silted to the extent where it is unfit for consumption or habitation; their burrows and breeding grounds can be compacted or damaged; and ORV use harms wildlife by direct contact. The noise from ORV use can affect the hearing and behavior of wildlife. Furthermore, the air can become polluted with dust or exhaust fumes caused by ORV use.

Impact on Soil

The three main effects that ORV use has on the soil are compaction, erosion, and damage to the soil biota.[1] Soil biota are made of non-living material, organic material, and living organisms. Shaun Bennett, in A Trail Rider's Guide to the Environment described soil compaction and the consequences:

> Soil compaction entails the packing of the soil particles into a smaller volume at the expense of the spaces between the particles, i. e., through a reduction of porosity. Decreased soil porosity will have several consequences; most of the smaller soil organisms will be killed, partly by mechanical crushing and partly by suffocation, since there will no longer be spaces through which air can reach them. Water will no longer be able to penetrate the soil in significant amounts and it will tend either to run off over the surface possibly promoting erosion, or it will puddle in low places where it will drown the life forms normally found there.[2]

The amount of soil that is compacted depends upon the soil type, climate, slope of the land, vegetation cover, and the type and weight of the ORV.[3]

Although soil is naturally eroded by water, ORV use can accelerate the process. As with compaction, the amount of erosion also depends on the type of soil, climate, slope of the land, vegetation cover, and the type and weight of an ORV.[4] ORV use accelerates soil erosion by first detaching or pulverizing the top part of the soil and removing the vegetation. Then, because ORV trails are often straight and smooth, water runoff in the paths can have a greater speed and carrying capacity of soil. By increasing runoff power, soil transportation is also increased. Normally, runoff is constricted by vegetation and irregular pathways.[5]

Soil erosion caused by wind is accelerated by ORV use. Because ORVs can loosen the soil, the amount of soil that can be moved by the wind is increased. When a NASA LANDSAT satellite image showed dust plumes in the western Mojave Desert, initial examinations showed evidence that some of these dust plumes were caused by ORV activity.[6] ORVs can accelerate erosion on flat land as well as sloping terrain, primarily by churning up the soil.

The biota in soil are "living organisms which abound in natural soil in incredible numbers - for instance a cubic foot of soil may contain billions of bacteria and millions of small to microscopic invertebrate organisms . . . ." Through compaction and soil erosion, the biota in the soil can be damaged. The biota are important to the soil because they provide the mechanisms that break down organic matter into nutrients for plant life.[7]

There are many illustrations showing that ORV use can cause soil damage. After an ORV race in the Mojave Desert, a knife could only enter the soil one-half inch because of increased compaction. In soil nearby, the blade of the knife could go all the way to the hilt.[8] In another situation at Jawbone Canyon, California, after removing all the topsoil, ORVs were cutting into the bedrock.[9] Wilshire and Nakata of the U. S. Geological Survey estimated the loss of soil from three areas of a Mojave Desert hill in an ORV use area to be "nearly 11,000 metric tons."[10]

Different types of ORVs can have different impacts on the soil. The weight of a vehicle is directly related to the amount the soil that can be compacted; the heavier the vehicle, the greater the compaction. Also, different vehicles typically have different tires sizes.

> A two-wheel ORV compacts soil, on the average, across a track about 5 in. (13 cm) wide. Thus, a single track ORV compacts 1 acre (0.4 ha) of soil in traveling 20 mi. (32 km). Tracks made by four-wheel ORVs are typically 18 in. (0.5 m) wide and, accordingly, disturb about 1 acre (0.5 ha) in 6 mi. (10 km) of travel.[11]

Therefore, the likelihood of damage to the soil is increased with wider tires and heavier vehicles.

Impact on Vegetation

Another consequence of ORV use is the impact on vegetation. Vegetation can be lost when erosion removes the soil that holds it in place; when soil is so compacted that water cannot infiltrate; and, when ORVs run over the

vegetation and destroy it. The amount of vegetation lost depends upon the type of plant life, the number of times direct contact is made, or the type of vehicle making contact.[12]

As mentioned previously, ORVs can accelerate erosion. Gullies are created as soil is removed; as this happens, inevitably the vegetation is lost. Once this occurs, more soil erosion may result. Now the path that was created by ORVs may widen, dislocating more soil and additional vegetation. The eroded soil may be deposited on other vegetation, thereby killing it through burial.[13]

Even a single pass of a vehicle can compact soil, and the compaction can eventually be a meter deep. When this happens, the workings of chemical and biological processes are hampered. As the soil becomes compacted, less water can infiltrate, reducing the amount of water in the soil available for vegetation.[14]

Each time ORVs come into direct contact with vegetation, the loss of vegetation is increased. The losses of vegetation "include crushing of the foliage, root systems, and seedlings by the wheels, and uprooting of small plant cover and disruption of root systems of larger plants by shear stresses induced in the soil."[15] The damage that ORVs cause to plants may be larger than the width of the track because stems and foliage, along with the plants' root systems, can be "uprooted by the superstructure of vehicles."[16]

Impact on Sand Dunes

On sand dunes, soil and vegetation can be lost. As soil is separated by the wind, the heavier and coarser particles eventually are left on top, with the smaller ones underlying the larger ones. "On dunes the surface also tends to stabilize as sand grains are sorted and the surface is streamlined by wind action."[17] In dune areas, vegetation and soil biota also restrict the soil from movement. But when ORVs are used on sand dunes, they churn the sand into smaller particles, allowing them to be blown away by the wind.[18] Vegetation can be lost in sand dunes for the same reasons that vegetation is lost in other soil types.

Destabilization of sand dunes transpires when the soil is eroded and plant life is lost. When ORVs are driven on costal sand dunes, vegetation is destroyed on the back of the dunes, and openings occur on their faces. When this happens, "blowouts" can develop. Blowouts are the result of a "wind-tunneling effect, channeling the wind and broadening the bare areas."[19] Now storm tides are able to scour out larger parts of the dune system. This in turn leads to greater vegetation loss and eventually leads to further dune destabilization.[20]

Impact on Water Environments

ORV use causes harm to water environments in several ways. First, because of accelerated erosion, deposits of

silt in the water are increased. Second, ORV use often takes place in water environments, causing direct destruction of the habitats for many types of animals. Third, there is a risk of oil and gas leakage.[21]

Once soil is loosened by ORVs and has eroded away, the increased runoff of soil may go directly into ponds, lakes, streams, and rivers. This increase of water-carried soil can have detrimental effects on water environments. In California's Sequoia National Forest, an ORV area was closed because of the heavy erosion caused by ORVs. The erosion had resulted in increased silting of a nearby river, negatively affecting a spawning ground for golden trout.[22] Due to the number of ORVs driving in the Black River near Lesterville, Missouri, the fish quit spawning as the clear water became muddy.[23]

As ORVs traverse river beds, any flooding can be intensified by the tracks that are left. Also, the motion of the water may increase the removal of the river banks, when the vegetation is destroyed by ORV traffic.[24] ORVs can destroy the algae on rocks in river bottoms, a main food source for many aquatic creatures.[25]

The spillage of oil and gas is one way ORVs pollute the water environment. When oil and gas come into contact with the water, they form a "sub-microscopically thin layer which can cover a huge area in relation to the amount of gas (or oil) involved . . . ."[26] This pollution can devastate the life forms that depend on the water. Endangered species,

such as the desert pupfish, desert tortoise, and bighorn sheep, have been reduced in numbers because of pollution and depletion of water resources.[27]

Impact on Air Quality

Another part of the environment that is affected by ORV use is the air. The two main effects on air, in relation to ORV use, are exhaust emissions and renegade dust. Off-road vehicles release exhaust fumes that are loaded with unburned fuel, particularly by the two-cycle type of ORV. Unburned fuel and exhaust fumes cause visual and chemical pollution of the air. "Both the two-cycle and the four-cycle engines emit unburned hydrocarbons and oxides of nitrogen that are the primary ingredients of photochemical smog."[28]

Dust is released into the air when ORVs remove the small particles of dirt from the soil surface, which then hangs in the air. Even after ORVs have left the area, dust may enter the air through wind erosion. Dust is the worst in areas of little vegetation or little water. Although wind may not be present, dust may still enter the air through ORV activity.[29]

In 1973, a LANDSAT image was taken of the Mojave Desert. In this image were six dust plumes. The dust plumes ranged in size from 15 to 75 kilometers, covering about 1735 square kilometers. The "preliminary field examination indicated that the dust storms were caused by destabilization of the desert surface by off-road vehicle

(ORV) activity."[30] Here, images taken from outer space, show that ORV activity can cause a larger than normal movement of soil.

Dust in the air can be a major problem. Bowden described the seriousness of dust and airborne soil:

> Consequently, dust has become a major complaint of desert residents and a major concern of conservationists because of the accelerated erosion. Glass damage due to sand pitting of windows in homes and motor vehicles and structural damage to camper trailers and large truck trailers during the Santa Ana condition make travel warnings necessary. Structural damage to power lines and poles, dwellings, ornamental trees, outdoor advertising, and recreational and transport facilities may be costly.[31]

Impact on Wildlife

All effects on the environment have an effect on wildlife. When soil erosion is accelerated by ORV use, burrows used by wildlife can be lost. The increased silting of streams can have negative effects on spawning fish.[32] When the soil loses its ability to hold plant life, wildlife can lose food and cover. Wildlife decreases as the plant life that supports it decreases.[33]

When driving down a paved roadway, dead animals often are seen that have been hit by vehicles. This is also the case in ORV areas. Animals that are not quick enough, do not see or hear the approaching vehicle, or are too frightened to move, may be killed or maimed by direct contact with ORVs. In some cases, "animals are deliberately molested and maimed by some ORV users,"[34] and other wildlife is chased

until death. In the Grand Teton National Park in Wyoming, snowmobilers have been caught pursuing and running over coyotes.[35]

ORVs also can have an effect on wildlife by being able to reach areas that had not been readily accessible to man. At a Minnesota lake, canoeist had to paddle six miles to reach a trout area. In one day, 120 snowmobilers took out 556 pounds of trout, essentially eradicating the fish population.[36] Another problem is the removal of animals from an area. Slow moving animals, such as the desert tortoise (a protected species), sometimes are carried off by ORV users who want to bring part of the desert back with them.[37]

The noise caused by ORVs can have a detrimental effect on wildlife. Many animals depend on their hearing for survival. These creatures require acute hearing to avoid being killed by predators. Still others use their hearing to find and attract mates. Also, high-intensity sound can cause stress and physical pain to humans; this could be true for wildlife.[38]

In a summary on the effects of noise on desert vertebrates, Brattstrom and Bondello stated:

> The foregoing studies indicate that ORV activities in the California Desert represent disruptive and often destructive influences on the native wildlife of this region. They show that the noise of dune buggies and motorcycles: (a) definitely caused hearing losses in animals with little or no recovery; (b) interfered with their ability to detect predators; and (c) caused behavior in an unnatural manner that put the animal in a situation which could result in death. Further, these

> studies indicate that ORV sound levels of lower intensity and shorter duration than those monitored in the desert can disrupt and destroy essential features of desert wildlife. Detrimental effects of ORV sounds result from the acute sensitivity of desert vertebrates to the reception of specific environmental sounds.[39]

Although the noise causes the desert vertebrates harm, they are not able to flee. Most are small animals that could not travel long distances to escape, and possibly would die before finding a safe area. Even when leaving an area would be the best choice for an animal, the option to move is not available for smaller creatures. The impacts on sensitive environments of small size increase the potential damage to life in that environment.

While noise can have a detrimental impact on smaller animals, this might not be true for larger animals, such as the white-tailed deer. Bollinger indicated, " . . . snowmobiles have to be within sight of the deer before the animal will react by moving away."[40] The study also indicated that the deer did not move great distances away, even though they could.

Other examples of ORV impact on wildlife follow. Ghost crab populations have decreased in ORV use areas were the sand has been compacted. In 20 years, the population of shorebirds in one area has decreased to 5,000 from 30,000.[41] In a desert ORV area, the wildlife population has decreased about sixty percent in a "moderately" used location.[42]

Overall, ORVs have many and varied types of impact on the environment. ORVs negatively affect soil, vegetation, air quality, water environments, wildlife, and even sand dunes. Research has shown that the effects depend on the type of environment that is being impacted. Even so, every environment can be impacted to some extent from ORV use.

Literature Related to Social Demographics of Off-Road Vehicle Users

Off-road vehicle users are comparable to "average" Americans on six characteristics. These six characteristics are education level, income, percent employed, marital status, political party affiliation, and political liberalism and conservatism.[43] Table I (see page 25) shows the similarities between the general public and ORV users in the State of Washington.[44]

On the basis of gender, age, ethnicity, and "location of residence along both regional and rural/urban dimensions," ORV users are decisively different from the general public.[45] If a community or state is more rural, there are more ORVs in relation to the population. States like Wyoming and Utah have more ORVs per 100 population than states like New York or New Jersey.[46] Ethnicity of ORV users is clearly white, specifically "Northwest European."[47]

Table II (see page 26) shows the results of six representative studies based on age and sex distributions.[48]

TABLE I

GENERAL PUBLIC VS. ORVERS: SIMILARITIES (WASHINGTON)**

	EDUCATION				
	GP	M2Wh	M4Wh	SF2Wh	SF4Wh*
Average Education, mean =	13.3	12.8	13.0	12.5	12.7

	INCOME				
	Mailed Questionnaire Sample			Interviewees	
	General Public	Bikers	4-Wh	2-Wh	Original sample 2-Wh	Revised Schedule 4-Wh
Mean	$19588	$18953	$17512	$20505	$18497	$21022

	MARITAL STATUS (%)				
	GP	M2Wh	M4Wh	SF2Wh	SF4Wh
Not married	10.4	22.1	11.0	40.7	14.3
Now married	76.9	67.1	79.7	50.6	77.1
Divorced	8.5	7.4	8.0	7.8	7.3
Separated	1.7	1.3	1.3	0.6	1.3
Widowed	2.5	2.0	0.0	0.3	0.0

	POLITICAL PARTY AFFILIATION (%)				
	GP	M2Wh	M4Wh	SF2Wh	SF4Wh
Democratic	35.5	34.6	28.5	31.7	34.7
Republican	20.0	9.8	18.2	13.2	11.1
Independent	44.5	54.9	53.3	55.2	54.2

	GENERAL POLITICAL VIEWS (%)				
	GP	M2Wh	M4Wh	SF2Wh	SF4Wh
Liberal	15.3	15.4	13.8	23.0	20.9
Middle-of-the-Road	53.3	63.8	59.0	58.5	66.9
Conservative	31.4	20.8	27.2	18.5	12.2

* GP = general public subsample
M2Wh = motorcyclist mailed questionnaire subsample
M4Wh = 4-wheel-drive-ORV-users mailed questionnaire subsample
SF = interviewed motorcyclist (2Wh) and 4-wheelers (4Wh)

** A. E. Keir Nash, "Nature Aesthetics, the Public Interest, and ORV Users' Perspectives," Off-Road Vehicle Use: A Management Challenge, eds. Richard N. L. Andrews and Paul F. Nowak (Ann Arbor, Michigan: School of Natural Resources, University of Michigan, 1980), p. 19.

TABLE II

AGE AND SEX DISTRIBUTIONS OF ORV USERS**

Study	Location	ORV-Type	Mean Age	Median Age	% Male
Bury & Fillmore (1974)	Kentucky & Tennessee	2-wheel		24	
Plumb (1972)	Virginia	4-wheel		28	
Gogebic CC (1974)	Upper Great Lakes	snowmobile	26		
Gallup for MIC (1974)	National	2-wheel		24	
Nash (1976)	California	2-wheel		23	86
Nash (1979)	Washington	2-wheel	28	27	87
	interviews	4-wheel	32	33	85
	mailed	2-wheel	34	34	96
	surveys	4-wheel	38*	36*	90*

*The mailed questionnaire technique tends to yield results skewed relative to actual use, because of nonrespondent characteristics peaking in younger adult years (e.g., frequent rates of moving). Also, owners are on the average older than users largely because of title registration in the parent's name. The same point applies to sex distribution.

** A. E. Keir Nash, "Nature Aesthetics, the Public Interest, and ORV Users' Perspectives," Off-Road Vehicle Use: A Management Challenge, eds. Richard N. L. Andrews and Paul F. Nowak (Ann Arbor, Michigan: School of Natural Resources, University of Michigan, 1980), p. 17.

The American Motorcycle Association developed a pamphlet called Facts About Trail Riders.[49] The pamphlet related surveys done by the American Motorcycle Association and the Motorcycle Industry Council. While the information gathered may only be true for motorcyclist, the data is useful for looking at a large population of the ORV users:

- of the 7.3 million motorcycles in use in the United States, 3.8 million, or 52 percent, are used off-road at least occasionally.

- the average motorcyclist rides 480 off-road miles annually, putting on 25 percent of those miles in the spring, 47 percent in the summer, 17 percent in the fall, and 10 percent in the winter months.

- the average trail rider is male (92.1 percent), a high school graduate (34.6 percent), unmarried (51.7 percent), 27 years of age, has been riding a motorcycle for 11.6 years and has a household income of between $20,000 and $35,000.

- of each gallon of gasoline consumed in the United States, .015 percent is used by off-road motorcycles.

- the typical household has 2.4 motorcycles used for off-road riding, and 1.9 family members who trail ride. (American Motorcyclist Association members).

- recreational trail riding is the primary aim of 59.9 percent of those surveyed, and they travel an average of 57.4 miles to ride.

- 82 percent feel that users fees are an acceptable method of funding ORV facilities, with 53.6 percent preferring annual dirt bike registration fees, 40.6 percent preferring day-use fees and 1 percent feeling a combination of fees is best.

- nationally, riders primarily use national forest lands (34.5 percent), Bureau of Land Management (41.7 percent), state lands (33.9 percent) and private lands (54.6 percent).

Literature Related to Off-Road Vehicle Users' Knowledge

Only a few studies have investigated ORV users' knowledge or perception of environmental impact. The bulk of the literature is based on the impact of vehicles on the

land. But, there are some studies that are directed at identifying ORV users' knowledge of environmental impact.

A study of two Tucson ORV clubs indicated that the members were familiar with the general public's attention concerning the effects that the clubs' ORVs have on the environment. The members themselves conducted programs to lessen the harm caused by their vehicles. "The problem the two clubs are struggling to solve is how to make all the off-the-road pleasure vehicle owners in Tucson realize the threat their vehicles make to the fragile desert vegetation."[50]

In a study done in Ohio, only 5.5 percent of over 1000 ORV users realized that the effects of their vehicles could be potentially dangerous to the environment. Nearly seventy-five percent believed the " . . . overall environmental impact of ORVs operating in state forests as being minor or nonexistent." When asked to answer questions about a specific impact of ORVs, " . . . erosion was cited by 27.7 percent of the respondents, litter by 26.1 percent, wildlife destruction by 19.6 percent, and vegetation destruction by 10.9 percent."[51]

Another study was completed in a two-county area of New York State designed to identify snowmobilers' perception of their vehicles impact on the environment. The researcher wanted to determine the snowmobilers' " . . . awareness of snowmobile effects on wildlife and damage to vegetation."

Advantages and disadvantages of snowmobile use witnessed by the users, were also significant to the study:

> Only 7 percent of the respondent reported damage to wildlife. The foremost incident was intentional harassment of animals. Thirty-seven percent of the respondents reported benefits to wildlife as a result of snowmobiling. These included the use of snowmobile tracks by deer, snowmobilers carrying food to wildlife, and the rescuing of deer chased by dogs. Hill also noted that 28 percent of the respondents observed substantial vegetative damage by snowmobiles. Snowmobilers indicated that seedling and shrub damage were predominant.[52]

The majority of the literature on ORV users' knowledge and perception of environmental impact is mostly subjective. Many writers believe that ORV users have no knowledge that their vehicles can cause harm to the environment, or they believe that the users assume the environment can quickly recover.

One article of particular interest was written by Robert C. Stebbins, a professor of zoology at the University of California, Berkeley. Stebbins has written several papers on the effects of ORV use on the desert. He has postulated the predominant attitudes of ORV users. He proposed these attitudes after (1) reading many letters sent to the Bureau of Land Management concerning one of the management plans restricting ORV use, and (2) studying questionnaire responses gained at an off-road vehicle race between Barstow, California, and Las Vegas, Nevada. While these attitudes may be limited to only the users of ORVs in that area, these may be applicable to ORV users elsewhere:

1. The desert is tough.
2. When ORVs depart, the environment recovers in a few years.
3. Environmental damage will be increased if ORVs are forced to concentrate in a few areas.
4. It is the responsibility of government and scientists to prove that ORVs are damaging to the environment, before ORV recreation is banned.
5. There is little of value that can be damaged by ORVs in the desert.
6. If nobody is using the desert, what good it is?
7. ORV recreationist are the chief users of the desert.
8. Sociological values of ORVs outweigh the damage to the land.[53]

Literature Related to Off-Road Vehicle Use and the Non-ORV User

When participants of different recreational pursuits use the same physical facilities for their activities, conflicts can occur. For example, hikers may not like to use trails frequented by equestrian groups. Nature photographers and painters stay away from areas that are used by recreationists who are more "active." Because ORV users can intrude actively into the non-ORV users' physical space, the potential for conflicts is greater. The intrusions can come from ORV noise, dust, fumes, and physical impacts upon the environment.

> The magnitude of the off-road recreational vehicle problem lies in the fact that the off-road vehicle user can extend himself so pervasively into the physical and attitudinal space of virtually all other recreationists. He does this by his mobility, by the conspicuous sights and sounds he generates, and by the physical impacts or traces his vehicle so often leaves behind. The off-road vehicle is, in effect, a multiplier of man. An individual equipped with an off-road vehicle may

> equal the physical and aesthetic impact of many traditional users in an area.[54]

Conflicts between non-ORV users may not occur until they are within sight of each other. This is not always the situation between the ORV user and non-user.

> In an exceptionally quiet wildland environment, such as the desert, sound from a loud motorcycle is readily perceptible for great distances, often 1,500 meters or more. In such a situation, a motorcyclist traveling 120 kilometers in a day would extend his audible presence 1,500 meters on either side of his route of travel and thus into 390 square kilometers of adjacent terrain. On the other hand, 150 hikers, birdwatchers, or photographers could easily utilize such an area with few encounters or no awareness of another's proximal presence.[55]

Badaracco suggests that as ORV use increases in a recreational area, the satisfaction non-ORV users experience is reduced. The non-ORV user may visit the area less or become displaced. "Displacement is total abandonment of a site once the annoyed user has concluded that his satisfactions are no longer a match for his frustrations."[56]

The land managers measure the demands of the public by their current participation. As non-ORV users leave an area, the land managers may perceive that the public desire is for more ORV use areas. This may occur because the only users in the area may be ORV users. "Thus the administrator may allocate additional opportunities to a group which has suppressed or displaced a former traditional group."[57]

In summary, ORV use impairs non-ORV users' experience through invading their space with noise, exhaust fumes, or

damage to the environment. The noise caused by ORVs can travel great distances. As the number of ORV users increase in an area, non-ORV users may become dissatisfied or leave. If land managers perceive that ORV use is the desired use of land, more land may be specified for ORV use.

Literature Related to Methodology

A questionnaire was designed to collect data for this study. This method for gathering data is commonly used, " . . . to establish the nature of existing conditions."[58] The design for this instrument followed suggestions in Travers' An Introduction to Educational Research. Travers presented guidelines for development of the questionnaire and construction of the specific questions and statements to be included. These guidelines provided a method for analyzing the relevance of each question or statement.[59]

The procedure for sampling in this study was systematic sampling. "Systematic sampling is sampling in which individuals are selected . . . by taking every Kth" person.[60] The K is this study was three. L. R. Gay states, "Even though choices are not independent, a systematic sample can be considered a random sample if the list of the population is randomly ordered."[61] Since the list (subjects exiting an ORV use area) was random, this can be considered a random sample.

The size of the sample was also important when inferences are made to population parameters from sample

statistics. The χ^2 statistic is used for hypothesis testing. Sample size should exceed thirty-one respondents for analysis with the χ^2 statistic.[62] When the number of samples is large, the distribution of χ^2 is similar to a random sampling distribution.[63]

ENDNOTES

[1]Robert C. Stebbins, "Off-Road Vehicles and the Fragile Desert," The American Biology Teacher, May 1974, p. 294.

[2]Shaun Bennett, A Trail Rider's Guide to the Environment (Westerville, Ohio: American Motorcycle Association, August 1973), p. 17.

[3]T. Weaver and D. Dale, "Trampling Effects of Hikers, Motorcycles and Horses in Meadows and Forest," Journal of Applied Ecology 15 (1978), p. 451.

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[5]Robert H. Webb and Howard G. Wilshire, eds., Environmental Effect of Off-Road Vehicles: Impacts and Management in Arid Regions (New York: Springer-Verlag, 1983), pp. 86-89.

[6]J. K. Nakata, Howard G. Wilshire, and G. G. Barnes, "Origin of Mojave Desert Dust Plumes Photographed from Space," Geology, November 1976, p. 644.

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[8]Stebbins, p. 295.

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[22]Jack Hope, "The Invasion of the Awful ORVs," Audubon, January 1972, p. 39.

[23]"Hot Roadsters Are Breaking the Peace," Newsweek, 29 June 1987, p. 27.

[24]Dave Foreman, "ORVs Threaten a Wild Canyon," Living Wilderness, September 1979, p. 15.

[25]Bennett, p. 25.

[26]Ibid.

[27]Donald R. Murchie, "What Trackless Desert," Sierra Club Bulletin, March 1973, p. 25.

[28]Webb and Wilshire, p. 422.

[29]Ibid., p. 421.

[30]Nakata, Wilshire, and Barnes, p. 644.

[31]Leonard W. Bowden, and others, "Satellite Photograph Presents First Comprehensive View of Local Wind: The Santa Anna," Science, June 1974, p. 1078.

[32]"Hot Roadsters," p. 27.

[33]Webb and Wilshire, p. 417.

[34]Ibid.

[35]Hope, p. 39.

[36]Ibid.

[37]Stebbins, p. 297.

[38]Webb and Wilshire, p. 167-203.

[39]Bayard H. Brattstrom and Michael C. Bondello, "Effects of Off-Road Vehicle Noise on Desert Vertebrates," in Environmental Effect of Off-Road Vehicles: Impacts and Management in Arid Regions, ed. Robert H. Webb and Howard G. Wilshire (New York: Springer-Verlag, 1983), p. 202.

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[41]John Fialka, "Running Wild," National Wildlife, February 1975, p. 40.

[42]David Sheridan, "Dirt Motorbikes and Dune Buggies Threaten Desert," Smithsonian, September 1987, p. 69.

[43]A. E. Keir Nash, "Nature Aesthetics, the Public Interest, and ORV Users' Perspectives," in Off-Road Vehicle Use--A Management Challenge, ed. Richard N. L. Andrews and Paul F. Nowak (Washington, D.C.: U.S. Department of Agriculture and University of Michigan, 1980), p. 18.

[44]Ibid., p. 19.

[45]Ibid., p. 16.

[46]Ibid., p. 18.

[47]Ibid., p. 16.

[48]Ibid.

[49]American Motorcyclist Association, Facts About Trail Riders (Westerville, Ohio: American Motorcyclist Association, September 1983), p. 1.

[50]John Peine, "A Comparison of the Recreation Use Patterns of the Tucson Jeep Club and Tucson Sandbuggy Association" (M.S. thesis, University of Arizona, 1969), p. 33; quoted in Bury, Wendling, and McCool, p. 20.

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[52]Gregory Hill, "Towards Enhancing and Controlling Recreational Snowmobiling: A Study of Central New York Participants and Vehicle Use" (Master thesis, Cornell University, 1971), pp. 6,7,15; quoted in Bury, Wendling, and McCool, pp. 20-21.

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[55]Robert J. Badaracco, "Conflicts Between Off-Road Vehicle Enthusiasts and Other Outdoor Recreationists--The ISD Syndrome" (Southern California Academy of Sciences, in press). Reprinted with permission, quoted in David Sheridan, Off-Road Vehicles on Public Lands, Council on Environmental Quality (Washington, D.C.: Government Printing Office, 1979), p. 33.

[56]Ibid., p. 72.

[57]Ibid., p. 73.

[58]Robert M. W. Travers, An Introduction to Education Research (New York: Macmillan Publishing Co., 1987), p. 317.

[59]Ibid., pp. 330-333.

[60]L. R. Gay, Educational Research, Competencies for Analysis and Application, Second Edition (Columbus, Ohio: Charles E. Merrill Publishing Co., 1981) p. 96.

[61]Ibid.

[62]Gene V. Glass and Julian C. Stanley, Statistical Methods in Education and Psychology (Englewood Cliffs, New Jersey: Prentice-Hall Inc., 1970), p. 245.

[63]Celeste McCollough, Introduction to Statistical Analysis: A Semiprogrammed Approach (New York: McGraw-Hill, Inc., 1974), p. 166.

CHAPTER III

METHODS AND TECHNIQUES OF THE RESEARCH

Introduction

This study was designed to ascertain Oklahoma ORV users' knowledge base of ORVs' impact upon the environment; identify their opinion whether an adverse impact upon the environment is an acceptable consequence of ORV use; and identify their opinions whether management of ORV use areas should be paid for by the ORV users. To accomplish the purposes of the research, a data collection instrument was developed, sites and subjects were selected, the instrument was administered, and statistical procedures were applied to the collected data.

Development of the Data Collection Instrument

The data collection instrument for this study was a questionnaire developed by the researcher and juried by a panel of experts. The questionnaire contained three distinctive sections.

The first section of the questionnaire contained a consent statement. This informed the subject that participation was voluntary, and that no information gathered can

be personally identifiable with the individual (see Appendix A).

The second section of the questionnaire contained questions concerning the demographics of the subject (see Appendix A). This section of the questionnaire was derived from a questionnaire Dr. Lowell Caneday, and his staff from Oklahoma State University, used in surveying Oklahoma State Park users.[1] Participants were asked to answer questions on their gender, whether they were a passenger or a driver in the ORV, type of ORV they were using, age, race/ethnicity, employment status, number of years of formal education, present residence, zip code, years of operating ORVs, whether they were a member of an organized ORV club, and household income. The researcher filled in the date, time, and location.

The third part of the questionnaire asked the subject to respond to nineteen statements on a Likert Scale (see Appendix A). A Likert Scale asked the respondent to "indicate whether they strongly agree, agree, are undecided, disagree, or strongly disagree with each statement."[2]

In the application of this section, Statement #1 through #14 asked the participant to respond (1) Strongly Agree, (2) Agree, (3) No Opinion/Do Not Know, (4) Disagree, or (5) Strongly Disagree to a statement about the impact of ORVs on the environment. In designing the statements, relevant literature provided a basis for each statement. The statements were based on ORVs' impact on the environment as

a whole, impact on wildlife, impact on vegetation, impact on non-ORV users, impact on the soil, and impact on the water environment.

The participants were asked to respond to Statements #15, #16, #17, and #19, concerning adverse ORV use as an acceptable consequence. These consequences included (1) soil erosion, (2) loss of vegetation, (3) loss of wildlife from the area, and (4) any impact of ORV use; assuming that ORVs did cause an impact upon the environment. Possible responses were the same as for the previous statements.

Statement #18 asked the participants whether they believed that the ORV users should pay for management of specific areas to be used by their vehicles.

When the initial questionnaire had been prepared, a panel of professionals with experience in recreation and leisure, and an extensive background in research, examined the questionnaire. Incorporated into the final preparation of the questionnaire, were the recommendations of the panel. Every member of the panel was asked to review the questions and statements, and make criticisms based on the following criteria:

1. Is each question and statement accurate in subject matter?

2. Is each question and statement properly stated and easy to understand?

3. Is the questionnaire well organized and concise?

4. Is each question and statement neutral so as not to indicate a desired or preferred answer?

5. Is each question and statement important enough to be asked, and are there any major omissions?

After the final form was assembled, the Institutional Review Board of Oklahoma State University reviewed and approved the questionnaire.

The Process of Sampling

The sites to be sampled were selected from within the State of Oklahoma. To identify those areas used by ORV users, the American Motorcyclist Association's publication Trail Riding in America was used. This publication identified eight sites in Oklahoma, and all eight sites were surveyed. One site, Keystone Lake, had two areas that were considered as separate sites. These two areas were considered separately in the data analysis. The eight sites are:

1. Draper Lake Motorcycle Area. This 400 acre site, maintained by Oklahoma City, is located on the north side of Lake Stanley Draper in southwest Oklahoma City.

2. Gruber ORV Area. This ORV area is located southwest of Muskogee is eastern Oklahoma. The 30 miles of trails are maintained by the Oklahoma Department of Tourism and Recreation.

3a. White Water Park at Keystone Lake ORV Area. This is one of the two areas maintained by the Army Corps of

Engineers at Keystone Lake. This area is maintained for the use of all ORV types.

3b. Appalachia Bay at Keystone Lake ORV Area. This is the second of the two areas maintained by the Army Corps of Engineers at Keystone Lake. This area is a motorcycle use only area.

4. Kaw Lake ORV Area. Kaw Lake is a 240 acre site maintained by the Army Corps of Engineers near Ponca City in north-central Oklahoma. This is a motorcycle use only area.

5. Lake Murray's Pear Orchard Motorcycle Use Area. This area is maintained by the Oklahoma Department of Tourism and Recreation. The area is located in the northwest part of Lake Murray State Park near Ardmore in south-central Oklahoma.

6. Little Sahara Recreation Area. Little Sahara Recreation Area is located near Waynoka in northwestern Oklahoma. This area consists of 1480 acres, most of which are sand dunes. The area is maintained by the Oklahoma Department of Tourism and Recreation.

7. Quartz Mountain ORV Area. This area is on the north shore of Lake Lugert-Altus. The Oklahoma Department of Tourism and Recreation maintains this 400 acres in southwestern Oklahoma for ORV use.

8. Stillwater Park and Recreation Motorcycle Area. This 720 acre site, southwest of Stillwater, is maintained by the City of Stillwater. Stillwater is located in north-central Oklahoma.

The nine ORV use areas were then assembled into three groupings. The groupings consisted of three ORV use areas each. Every grouping consisted of ORV use areas that were located near each other. The areas were grouped together to reduce travel time and provide for the efficient use of allocated dates. The three ORV use areas in each grouping were arranged randomly. The three ORV use areas for the groups were:

1. White Water Park and Appalachia Bay at Keystone Lake ORV Area, and Gruber ORV Area.

2. Draper Lake Motorcycle Area, Lake Murray's Pear Orchard Motorcycle Use Area, and Quartz Mountain ORV Area.

3. Stillwater Park and Recreation Motorcycle Area, Little Sahara Recreation Area, and Kaw Lake ORV Area.

After the sites had been selected and grouped together, the possible dates for on-site interviews were selected. The dates from April 11, 1988 to June 11, 1988 were the range of dates chosen. These dates were selected to obtain an adequate sample and to meet budgetary demands.

The days in this time period were put into consecutive pairs. The pairing of days reduced overnight travel. In this manner, a survey could be done on two consecutive days at one location.

The pairs of days that contained a Friday, Saturday, or Sunday, were given additional weight when the process of sampling began. Therefore, a pair that contained a Friday, Saturday, or Sunday, was twice as likely to be chosen as a

pair that did not contain one of these days. These particular pairs were given additional weight because the majority of ORV users tends to use their vehicles during these three days.

Eighteen pairs of days were selected. This provided for a survey at each site, twice, on two consecutive days, four days total. Thus, thirty-six days were established for the nine on-site surveys.

After random sampling with replacement, the following pairs of days resulted: April 11-12, 17-18, 23-24, 25-26, 29-30, May 1-2, 3-4, 5-6, 9-10, 13-14, 15-16, 19-20, 27-28, 29-30, May 31-June 1, 6-7, 8-9, and 10-11. These pairs of days were placed into groups of three consecutive set of dates (six days total) starting with the first pair. Next, each group of pairs (six days) was randomly assigned to each group of sites (three locations). A given location was randomly assigned within a group and then matched with the resulting sequence of dates assigned to that grouping.

The resulting schedule for the on-site surveys follows:

1. White Water Park at Keystone Lake ORV Area
   April 11-12, June 6-7.
2. Appalachia Bay at Keystone Lake ORV Area
   April 17-18, June 8-9
3. Gruber ORV Area
   April 23-24, June 10-11
4. Kaw Lake ORV Area
   April 25-26, May 3-4

5. Stillwater Park and Recreation Motorcycle Area

   April 29-30, May 5-6

6. Little Sahara Recreation Area

   May 1-2, May 9-10

7. Draper Lake Motorcycle Area

   May 13-14, May 27-28

8. Quartz Mountain ORV Area

   May 15-16, May 29-30

9. Lake Murray's Pear Orchard Motorcycle Use Area

   May 19-20, May 31-June 1

In the case of inclement weather or lack of participants to survey, alternate dates were selected at random from the remaining available days. Inclement weather was considered weather that was dangerous to the researcher or the ORV user such as potential tornado, hail, or flood conditions.

Selection of Subjects

The selection of subjects followed a consistent routine. The researcher started surveying at 8:00 a.m. at each site. The survey continued until 7:00 p.m. each day.

As an ORV exited the actual ORV use area, that vehicle was counted. Every third vehicle was stopped and the operator was asked to participate in the study. If the stopped vehicle was multi-passenger, all persons were asked to respond to the questionnaire. If the vehicle that was stopped was a single passenger ORV, only the individual

operating that vehicle was asked to participate in the study. If the driver's cohorts of a single passenger ORV also stopped for the interviewer, they were asked to participate in the study. In this manner, the true cohorts of the ORV user, whether in the same vehicle or in the same group, were included in the study.

If a person refused to participate in the survey, that vehicle was counted and the process of vehicle selection was resumed. If vehicles passed the surveyor while a survey was being conducted, those vehicles were counted but no contact was attempted. Once the survey in progress was completed, the next vehicle whose count was divisible by three was stopped.

Prior to on-site surveys, places for conducting the surveys were chosen at each site. The place chosen at each location was based on four criteria. The criteria were:

1. The location was a clearly designated exit from the actual ORV use area.

2. The location had adequate space for the subject(s) to move out of the way of other exiting ORV users.

3. The location was a safe place to conduct the surveys for both the subject(s) and the researcher.

4. The location had ease of access for both subject(s) and the researcher.

The only ORV location that did not meet these requirements was Little Sahara Recreation Area. As the ORV users left the actual ORV area, there was no room to ask the

subject(s) to pull over and participate in the study. If the ORV user had been asked to stop and participate, the safety of the subject(s) and the researcher would have been in jeopardy. Therefore, every third campsite was surveyed in the ORV use area, and every third vehicle leaving the Little Sahara Recreation Area, who had not previously participated in the study, was asked to participate.

Methods for Reporting Data

The Statistical Package for the Social Science ($SPSS^x$) was used for analysis. The data gathered are reported as frequency measures for the demographic variables. Parametric and nonparametric procedures were applied to these data. For the data gathered on the respondents' knowledge of the environmental impact of ORVs (Statement #1 through Statement #14), responses are reported as frequencies, percentages, and cumulative percentages. Then the responses for those statements are regrouped to reflect the responses that were or were not in agreement with the appropriate available literature; frequencies and percentages were tabulated. Two summary tables for Statements #1 through #14 (excluding #13) are reported.

The final five statements (Statement #15 through Statement #19), are reported as frequencies, percentages, and cumulative percentages. Two summary tables for Statements #15, #16, #17, and #19 are reported.

Data gathered for Statement #1 through Statement and the variables of the demographics were crosstabula using the CROSSTAB procedure in SPSS^{x}. The CROSSTAB procedure produces contingency tables that show column, row, and table totals and percentages. The χ^2 (chi square) statistic to show measure of association was also selected. The chi square statistic is used to examine if there is a level of significance between opinions or attitudes for two or more groups.

The model for reporting in the contingency tables is as follows:

COUNT ROW PCT COL PCT TOT PCT	A1	A2	A3	ROW TOTAL
B1	A1B1 ROW PCT COL PCT TOT PCT	A2B1 ROW PCT COL PCT TOT PCT	A3B1 ROW PCT COL PCT TOT PCT	ROW TOT R.T.P.
B2	A1B2 ROW PCT COL PCT TOT PCT	A2B2 ROW PCT COL PCT TOT PCT	A3B2 ROW PCT COL PCT TOT PCT	ROW TOT R.T.P.
COLUMN TOTAL	COL TOT C.T.P.	COL TOT C.T.P.	COL TOT C.T.P.	TOTAL TOT PCT

For a single cell, A1B1 is the number of respondents, with a demographic variable of B1, responding to A1. ROW

PCT is the percentage of responses in that cell for that row, and COL PCT is the percentage of responses in that cell for that column. TOT PCT is the percentage of responses in that cell for the entire table.

ROW TOT is the total number of responses in that row, and COL TOT is the total number of responses in that column. R.T.P. is the percent of responses in that row compared to the total number of responses. C.T.P. is the percent of responses in that column compared to the total number of responses. TOTAL is the total number of responses, and TOT PCT is the total percentage of responses (100.0%).

At the bottom of each contingency table, is a chi square value with degrees of freedom. The chi square value with the degrees of freedom is used in determining the significance level. All hypotheses were tested for significance at the $\alpha = 0.05$ level. Statement #1 through #19 were measured for reliability using the RELIABILITY procedure in SPSS^{x}. The University Computer Center at Oklahoma State University provided computers and facilities.

ENDNOTES

[1]Doug Hawthorne and Wade French, 1987-1988 Oklahoma State Park Visitor Survey (Oklahoma City: Oklahoma Tourism and Recreation Department, April 1989), p. 51.

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CHAPTER IV

ANALYSIS AND SYNTHESIS OF DATA

Introduction

The data generated for this study were derived from the collection instrument discussed in Chapter III. The data provided by the collection instrument obtained demographic information about ORV users at selected sites in Oklahoma. The instrument also collected information about the ORV users' knowledge of environmental impact of ORV use, the ORV users' acceptance of ORVs' adverse impact upon the environment, and their opinion concerning whether ORV users should pay for the management of areas designated for ORV activities. The data were analyzed using statistical procedures including Pearson's Goodness of Fit in contingency tables. Reported percentages may not total 100 percent because of rounding.

Data Related to Survey Information and the Demographics of Off-Road Vehicle Users

Frequency tables and measurements related to the respondents' demographics and survey information (time and location) are shown in Tables III through XV. A "Missing" response indicates that the respondent did not reply.

Thirty-six days were allocated to on-site sampling. However, of the thirty-six days, five days produced no respondents at the sample sites (see TABLE III, page 53). Two hundred and twenty-three respondents were sampled during the thirty-one days in which there were respondents available. Five alternate days were selected at random to replace the sample days when no data could be gathered. These additional five days still did not produce respondents due to either lack of users at the selected sites, or inclement weather. Two sample days, one at the Stillwater Motorcycle Area and one at White Water Park at Keystone, did not result in sampling due to lack of respondents, with alternate days also yielding no respondents. In the case of three sample days without respondents at Appalachia Bay at Keystone Lake, the problem was two-fold. During the first two days to be sampled, Appalachia Bay was under water due to Lake Keystone flooding. Second, once the water had receded, adequate respondents were still unavailable for a third day, even after selecting alternate days at random.

The time of day that a survey was conducted varied from 8:15 a.m. to 7:00 p.m.. To simplify understanding of the time of day table, the times were condensed to "Noon & Before," and "After Noon" (see TABLE IV, page 54). Thirty-four respondents were surveyed before noon or at noon, which is 16.7 percent. The remaining 184, excluding two omitted responses, were surveyed after noon, or 82.5 percent.

TABLE III

SURVEY DATES, SITES, AND FREQUENCY MEASURES

Date	Site	Frequency	Percent	Cum. Pct.
Tuesday, 4/12	WW	2	0.9	0.9
Saturday, 4/23	GR	6	2.7	3.6
Sunday, 4/24	GR	15	6.7	10.3
Monday, 4/25	KA	3	1.3	11.7
Tuesday, 4/26	KA	1	0.4	12.1
Friday, 4/29	ST	2	0.9	13.0
Saturday, 4/30	ST	7	3.1	16.1
Sunday, 5/01	LS	23	10.3	26.5
Monday, 5/02	LS	13	5.8	32.3
Tuesday, 5/03	KA	4	1.8	34.1
Wednesday, 5/04	KA	2	0.9	35.0
Friday, 5/06	ST	4	1.8	36.8
Monday, 5/09	LS	10	4.5	41.3
Tuesday, 5/10	LS	5	2.2	43.5
Friday, 5/13	DR	3	1.3	44.8
Saturday, 5/14	DR	13	5.8	50.7
Sunday, 5/15	QU	12	5.4	56.1
Monday, 5/16	QU	1	0.4	56.5
Thursday, 5/19	MU	2	0.9	57.4
Friday, 5/20	MU	7	3.1	60.5
Friday, 5/27	DR	3	1.3	61.9
Saturday, 5/28	DR	7	3.1	65.0
Sunday, 5/29	QU	23	10.3	75.3
Monday, 5/30	QU	16	7.2	82.5
Tuesday, 5/31	MU	14	6.3	88.8
Wednesday, 6/01	MU	3	1.3	90.1
Monday, 6/06	WW	3	1.3	91.5
Tuesday, 6/07	WW	3	1.3	92.8
Friday, 6/10	GR	2	0.9	93.7
Saturday, 6/11	GR	8	3.6	97.3
Sunday, 6/12	AP	6	2.7	100.0
TOTALS	31	223	100.0	

WW - White Water Park at Keystone Lake ORV Area
AP - Appalachia Bay at Keystone Lake ORV Area
GR - Gruber ORV Area
KA - Kaw Lake ORV Area
ST - Stillwater Park and Recreation Motorcycle Area
LS - Little Sahara Recreation Area
DR - Draper Lake Motorcycle Area
QU - Quartz Mountain ORV Area
MU - Lake Murray's Pear Orchard Use Area

TABLE IV

SURVEY TIME OF DAY AND FREQUENCY MEASURES

Time of Day	Frequency	Percent	Cum. Percent
Noon & Before	37	16.7	16.7
After Noon	184	82.5	100.0
Missing	2	0.9	Missing
Total	223	100.0	

TABLE V (see page 55) shows the number of respondents that were sampled at each site. Two sites alone, Little Sahara and Quartz Mountain, produced 46.2 percent of the total respondents. The locations managed by the State of Oklahoma (Gruber, Lake Murray, Little Sahara, and Quartz Mountain), produced 71.8 percent of the respondents. The locations managed by cities, Stillwater Park and Draper Lake, produced 17.5 percent of the respondents. The locations managed by the Corps of Engineers, White Water, Appalachia Bay, and Kaw Lake produced 10.8 percent of the respondents.

The ratio of male respondents to female respondents was 204 to 18, or 91.5 percent to 8.1 percent (see TABLE VI, page 55). This roughly corresponded to previous studies done by Nash in 1976 and 1979 in which five samplings were 86 percent, 87 percent, 85 percent, 96 percent, and 90 percent male.[1] Nash's study and this study show that ORV

users are disproportionately male compared to the population in the United States.

TABLE V

SURVEY SITES AND FREQUENCY MEASURES

Site	Frequency	Percent	Cum. Pct.
White Water	8	3.6	3.6
Appalachia Bay	6	2.7	6.3
Gruber ORV Area	31	13.9	20.2
Lake Murray ORV Area	26	11.7	31.9
Stillwater ORV Area	13	5.8	37.7
Little Sahara	51	22.9	60.6
Draper Lake ORV Area	26	11.7	72.3
Quartz Mt. ORV Area	52	23.3	95.6
Kaw Lake Cycle Area	10	4.5	100.0
Total	223	100.0	

Mean = 24.78

TABLE VI

GENDER AND FREQUENCY MEASURES OF RESPONDENTS

Gender	Frequency	Percent	Cum. Percent
Male	204	91.5	91.9
Female	18	8.1	100.0
Missing	1	0.4	Missing
Total	223	100.0	

Whether the respondents were drivers of the ORV or passengers of the ORV are shown in TABLE VII (see page 56).

Of the 223 respondents, 198, or 88.8 percent were drivers of ORVs. The other 9 respondents, or 4.0 percent, were passengers. The small number of passengers may be because only 30.9 percent of ORVs were multi-passenger vehicles (see Table VIII, page 57). The 16 missing responses could possibly be due to the way the question was positioned on the questionnaire (see Appendix A).

TABLE VII

DRIVER OR PASSENGER FREQUENCY MEASURES

D/P	Frequency	Percent	Cum. Percent
Driver	198	88.8	95.7
Passenger	9	4.0	100.0
Missing	16	7.2	Missing
Total	223	100.0	

The types of ORVs used by the respondents were: 115 or 51.6 percent were motorcycles, 9 or 4.0 percent were 4-wheel drives, 30 or 13.5 percent were 3-wheel ATVs, 38 or 17.0 percent were 4-wheel ATVs, and 31 or 13.9 percent were dune buggies (see TABLE VIII, page 57).

For ease of understanding, the responses to age were grouped into three categories. The median age of a respondent was 25.0 years old (see TABLE IX, page 57). A Gallup poll done nationally in 1974, recorded a median age

for ORV users as 24.0 years old.[2] This study appear
support Nash's statement that ORV users are dispropo
tionately younger than the American public.[3] The me
age for the U.S. population was 32.3 years in 1988.[4] The
mean age of a respondent in this study was 27.6 years old.

TABLE VIII

TYPE OF ORV USED BY RESPONDENTS AND FREQUENCY MEASURES

Type of ORV	Frequency	Percent	Cum. Percent
Motorcycle	115	51.6	51.6
4 wheel Drive	9	4.0	55.6
3 wheel ATV	30	13.5	69.1
4 wheel ATV	38	17.0	86.1
Dune Buggy	31	13.9	100.0
Total	223	100.0	

TABLE IX

AGE OF RESPONDENTS AND FREQUENCY MEASURES

Age	Frequency	Percent	Cum. Percent
19 or younger	31	13.9	13.9
20 to 29	112	50.2	64.1
30 & older	80	35.9	100.0
Total	223	100.0	

Median = 25.0 years Mean = 27.6 years

The race/ethnicity of the respondents in the study appears in TABLE X. The percentage of whites, 93.3 percent, agrees with Nash's article that ORV users are predominately white.[5] Non-white ORV users represented only 6.3 percent of the respondents in this study.

TABLE X

RACE/ETHNICITY OF RESPONDENTS AND FREQUENCY MEASURES

Race/Ethnicity	Frequency	Percent	Cum. Percent
White	208	93.3	93.3
Black	2	0.9	94.6
Hispanic	2	0.9	95.5
Asian	6	2.7	98.2
American Indian	4	1.8	100.0
Missing	1	0.4	Missing
Total	223	100.0	

The type of employment the respondent reported is shown in TABLE XI (see page 59). The number of respondents reporting to be employed full-time were 153, or 68.6 percent. The number reporting to be employed part-time were 20, or 9.0 percent; self-employed were 17, or 7.6 percent; students were 25, or 11.2 percent; homemakers were 4, or 1.8 percent; and unemployed were 3, or 1.3 percent. Nash's findings were that ORV users mirror the U. S. public in percent employed.[6] While the average percent of Americans

unemployed fluctuates, 5.4 percent in 1988,[7] the percent unemployed found in this study was below average.

TABLE XI

EMPLOYMENT STATUS OF RESPONDENTS AND FREQUENCY MEASURES

Employment	Frequency	Percent	Cum. Percent
Full-time	153	68.6	68.6
Part-time	20	9.0	77.9
Self-employed	17	7.6	85.6
Student	25	11.2	96.8
Homemaker	4	1.8	98.6
Unemployed	3	1.3	100.0
Missing	1	0.4	Missing
Total	223	100.0	

The mean education level of the respondents in this study reflects what other studies have found. The average education of the public reported by Nash in his studies, conducted in the State of Washington, was 13.3 years.[8] The respondents in this study reported an average education level of 13.2 years (see TABLE XII, page 60). Fifty-two percent of the respondents reported an education level of more than 12 years. Only 13.5 percent of the respondents reported less than twelve years of education. The median education level for the respondents was 13.0 years.

TABLE XII

YEARS OF EDUCATION OF RESPONDENTS AND FREQUENCY MEASURES

Educ. Yrs.	Frequency	Percent	Cum. Percent
6	1	0.4	0.4
7	4	1.8	2.2
8	4	1.8	4.0
9	4	1.8	5.8
10	8	3.6	9.4
11	9	4.0	13.5
12	77	34.5	48.0
13	24	10.8	58.7
14	25	11.2	70.0
15	19	8.5	78.5
16	32	14.3	92.8
17	7	3.1	96.0
18	8	3.6	99.6
21	1	0.4	100.0
Total	223	100.0	

Mean = 13.2 years Median = 13.0 years
Mode = 12.0 years

In response to the question whether the subject belonged to an organized ORV club, 138 or 61.9 percent reported that they did belong to an ORV club (see TABLE XIII, page 61). Eight-four, or 37.7 percent responded that they did not belong to a club.

The number of years a respondent reported to have been operating an ORV varied from one year to 25 years (see TABLE XIV, page 61). The mean number of years reported was 6.4 years, while the median number of years operating an ORV was 4.0 years. The most frequent number of years reported for operating an ORV was one year.

TABLE XIII

ORV CLUB MEMBERSHIP AND
FREQUENCY MEASURES

Member	Frequency	Percent	Cum. Percent
Yes	138	61.9	62.2
No	84	37.7	100.0
Missing	1	0.4	Missing
Total	223	100.0	

TABLE XIV

YEARS OPERATING ORVS BY RESPONDENTS
AND FREQUENCY MEASURES

Years	Frequency	Percent	Cum. Percent
1	62	27.8	28.1
2	21	9.4	37.6
3	24	10.8	48.4
4	9	4.0	52.5
5	12	5.4	57.9
6	6	2.7	60.6
7	4	1.8	62.4
8	2	0.9	63.3
9	16	7.2	70.6
10	26	11.7	82.4
11	4	1.8	84.2
12	4	1.8	86.0
15	5	2.2	88.2
16	4	1.8	90.0
17	4	1.8	91.9
18	4	1.8	93.7
19	2	0.9	94.6
20	8	3.6	98.2
21	2	0.9	99.1
22	1	0.4	99.5
25	1	0.4	100.0
Missing	2	0.9	Missing
Total	223	100.0	100.0

Mean = 6.4 years Median = 4.0 years
Mode = 1.0 year

In regard to income, Nash found that the average ORV users' income was close to that for the general public.[9] The median household income for the U.S. was $32,191 in 1988.[10] Because the respondents were asked to answer the question about income by marking selected ranges indicating one's income, true central tendencies of the ORV users' income in this study cannot be accurately calculated (see TABLE XV). The mean income reported by ORV users in this study may fall in the $25,001 to $35,000 interval, with the median in the same interval.

TABLE XV

INCOME LEVEL OF RESPONDENTS AND FREQUENCY MEASURES

Income Level	Frequency	Percent	Cum. Pct.
1 Under $15,000	34	15.2	15.7
2 $15,001 to $25,000	63	28.3	44.9
3 $25,001 to $35,000	47	21.1	66.7
4 $35,001 to $45,000	24	10.8	77.8
5 $45,001 to $55,000	18	8.1	86.1
6 $55,001 to $65,000	6	2.7	88.9
7 More than $65,000	24	10.8	100.0
Missing	7	3.1	Missing
Total	223	100.0	

Mean = 3.2 Median = 3.0 Mode = 2.0

Data Related to Off-Road Vehicle Users' Knowledge of Environmental Impact

ORV users were asked to respond to fourteen statements designed to identify their knowledge of the environmental impact resulting from ORV use. Responses to statements and frequency measures are shown in TABLE XVI through TABLE XXIX. There are two tables for each statement. The first table shows frequency measures for the responses to a statement. The second table excludes the "No Opinion/Not Know" responses and combines the "Strongly Agree" with the "Agree" responses and the "Strongly Disagree" with the "Disagree" responses. Then frequency measures are shown for "Match" and "No Match." "Match" indicates that the response to the statement corresponded to the position taken in the current literature. "No Match" indicates that the response to the statement did not correspond to the position taken in the current literature. The number of "No Opinion/Not Know" are listed under the second table.

Statement #1 was, "ORV use in designated areas has little effect on non-ORV users." In relation to this statement, Badacarro showed that ORV use did have an effect on non-ORV users. ORV use caused non-ORV users to leave the area.[11] Of the 223 respondents, only 18 (8.1%) had matching responses (see TABLE XVIa, page 64). This statement produced the smallest number of "No Opinion/Not Know" responses, 15 (6.7%). Eighty-five percent of the respondents agreed that ORV use has little effect on non-ORV

users. Nearly one-half, 46.6 percent, "Strongly Agreed" that ORV use had little effect on non-ORV users.

After the responses were combined, and "No Opinion/Not Know" responses were dropped (see Table XVIb), this produced the largest percent of non-matching responses, 91.3 percent, for Statement #1 through Statement #14; and the smallest percent of matching responses, 8.6 percent.

TABLE XVIa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #1: "ORV USE IN DESIGNATED AREAS HAS LITTLE EFFECT ON NON-ORV USERS."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	104	46.6	46.6
Agree	86	38.6	85.2
No Opinion\Not Know	15	6.7	91.9
Disagree	18	8.1	100.0
Strongly Disagree	0	0.0	
Total	223	100.0	

TABLE XVIb

STATEMENT #1 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	18	8.6
No Match	190	91.3
Total	208	100.0

No Opinion/Not Know n = 15

Statement #2 was, "ORV use causes no harm to the environment." In TABLE XVIIa, 58.4 percent agreed that ORV use causes no harm to the environment. Fifty-one respondents (21.8%), disagreed with Statement #2. Forty-one respondents (19.7%) had no opinion or did not know in response to this statement. Studies by Weaver and Dale[12] and Webb and Wilshire[13] have shown that ORVs do damage the environment. The "Match" and "No Match" frequencies for literature agreement were 51 (28.3%) and 129 (71.1%), respectively (see TABLE XVIIb, page 66).

TABLE XVIIa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #2: "ORV USE CAUSES NO HARM TO THE ENVIRONMENT."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	50	22.4	22.6
Agree	79	35.4	58.4
No Opinion\Not Know	41	18.4	76.9
Disagree	44	19.7	96.8
Strongly Disagree	7	3.1	100.0
Missing	2	0.9	Missing
Total	223	100.0	

Statement #3 was, "ORV use in sand dunes has little effect on the sand dunes' vegetation." The literature has shown that ORV use in sand dune areas has a large effect on the sand dunes' vegetation.[14] Ninety-nine respondents

(44.6%) responded "Agree" or "Strongly Agree" to Statement #3 (see TABLE XVIIIa). Sixty-four (28.7%) responded "Disagree" or "Strongly Disagree." Fifty-nine (26.5%) responded that they did not know or had no opinion. Sixty-four responses (39.3%) matched and ninety-nine (60.7%) did not match (see TABLE XVIIIb, page 67).

TABLE XVIIb

STATEMENT #2 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	51	28.3
No Match	129	71.7
Total	180	100.0

No Opinion/Not Know n = 41

TABLE XVIIIa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #3: "ORV USE IN SAND DUNES HAS LITTLE EFFECT ON THE SAND DUNES' VEGETATION."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	53	23.8	23.9
Agree	46	20.6	44.6
No Opinion\Not Know	59	26.5	71.2
Disagree	56	25.1	96.4
Strongly Disagree	8	3.6	100.0
Missing	1	0.4	Missing
Total	223	100.0	

TABLE XVIIIb

STATEMENT #3 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	64	39.3
No Match	99	60.7
Total	163	100.0

No Opinion/Not Know n = 59

Statement #4 was, "The noise caused by ORVs drive wildlife from the area." A research summary by Bury, Wendling, and McCool indicated that while animals such as deer may not leave the area, other animals that are smaller appear not to be driven from the area.[15] Seventy-six (34.1%) "Strongly Agree" or "Agree" that ORV noise drove animals from the area. One hundred-fifteen (51.6%) "Disagree" or "Strongly Disagree" with the statement. The remaining 32 (14.3%) did not know or had no opinion (see TABLE XIXa, page 68). TABLE XIXb (see page 68) shows the number of "Match" and "No Match." One hundred and fifteen (60.2%) matched and seventy-six (39.8%) did not match.

Statement #5 was, "ORV use has no effect on the soil's ability to absorb water." Over one-third, 36.8 percent, responded as not knowing or had no opinion (see TABLE XXa, page 69). ORV use does have an effect on the soil's ability to absorb water, as shown by Webb and Wilshire.[16] Forty-five (20.2%) respondents "Disagree" or "Strongly Disagree"

with the statement. Ninety-six subjects (43.0%) "Strongly Agree" or "Agree." TABLE XXb (see page 69) shows the "Match" and "No Match" responses. "Match" responses were forty-five (31.9%), and "No Match" responses were ninety-nine (68.1%).

TABLE XIXa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #4: "THE NOISE CAUSED BY ORVS DRIVE WILDLIFE FROM THE AREA."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	12	5.4	5.4
Agree	64	28.7	34.1
No Opinion\Not Know	32	14.3	48.4
Disagree	68	30.5	78.9
Strongly Disagree	47	21.1	100.0
Total	223	100.0	

TABLE XIXb

STATEMENT #4 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	115	60.2
No Match	76	39.8
Total	191	100.0

No Opinion/Not Know n = 32

TABLE XXa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #5: "ORV USE HAS NO EFFECT ON THE SOIL'S ABILITY TO ABSORB WATER."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	39	17.5	17.5
Agree	57	25.6	43.0
No Opinion\Not Know	82	36.8	79.8
Disagree	31	13.9	93.7
Strongly Disagree	14	6.3	100.0
Total	223	100.0	

TABLE XXb

STATEMENT #5 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	45	31.9
No Match	96	68.1
Total	141	100.0

No Opinion/Not Know n = 82

Statement #6 was, "ORVs destroy vegetation by running over the stems and roots." This has been demonstrated to be true by Wilshire, Shipley, and Nakata.[17] One hundred responded (45.0%) "Strongly Agree" or "Agree," 77 respondents (34.6%) "Disagree" or "Strongly Disagree," and 45 (20.2%) had no opinion or did not know (see TABLE XXIa, page 70). This statement produced the third highest percent of match-

ing responses, 56.5 percent. Seventy-seven respondents' (43.5%) responses did not match (TABLE XXIb).

TABLE XXIa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #6: "ORVS DESTROY VEGETATION BY RUNNING OVER THE STEMS AND ROOTS."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	13	5.8	5.9
Agree	87	39.0	45.0
No Opinion\Not Know	45	20.2	65.3
Disagree	51	22.9	88.3
Strongly Disagree	26	11.7	100.0
Missing	1	0.4	Missing
Total	223	100.0	

TABLE XXIb

STATEMENT #6 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	100	56.5
No Match	77	43.5
Total	177	100.0

No Opinion/Not Know n = 45

Statement #7 was, "ORVS can only harm animals by running over the animals." Direct contact, or running over animals, is not the only way ORVs can harm animals. The

noise and destruction of vegetation are two other ways ORVs can harm animals.[18] Of the 223 respondents, 52.0 percent of the respondents answers matched. Sixty-two respondents (27.8%) answers did not match. Forty-five respondents (20.2%) answered as "No Opinion/Not Know" (see TABLE XXIIa). After removing the "No Opinion/Not Know" responses (see TABLE XXIIb, page 72), the percent of "No Match" answers moved up to 65.2 percent, and the percent of "Match" answers became 34.8 percent.

TABLE XXIIa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #7: "ORVS CAN ONLY HARM ANIMALS BY RUNNING OVER THE ANIMALS."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	49	22.0	22.0
Agree	67	30.0	52.0
No Opinion\Not Know	45	20.2	72.2
Disagree	49	22.0	94.2
Strongly Disagree	13	5.8	100.0
Total	223	100.0	

Statement #8 was, "ORVS driven on sand dunes can lead to erosion." According to the literature, ORVs driven on sand dunes can lead to erosion.[19] Seventy-four respondents' (33.2%) answers were "Strongly Agree" or "Agree" (see TABLE XXIIIa, page 72). Ninety-one respondents' answers

(40.8%) were "Disagree" or "Strongly Disagree." Fifty-eight respondents (26.0%) answered "No Opinion/Not Know." Once the "No Opinion/Not Know" responses were dropped, "Match" and "No Match" answers were 44.8 percent and 55.2 percent, respectively (see TABLE XXIIIb, page 73).

TABLE XXIIb

STATEMENT #7 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	62	34.8
No Match	116	65.2
Total	178	100.0

No Opinion/Not Know n = 45

TABLE XXIIIa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #8: "ORVS DRIVEN ON SAND DUNES CAN LEAD TO EROSION."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	12	5.4	5.4
Agree	62	27.8	33.2
No Opinion\Not Know	58	26.0	59.2
Disagree	56	25.1	84.3
Strongly Disagree	35	15.7	100.0
Total	223	100.0	

TABLE XXIIIb

STATEMENT #8 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	74	44.8
No Match	91	55.2
Total	165	100.0

No Opinion/Not Know n = 58

"ORV use causes soil erosion on flat land," was Statement #9. Literature shows that ORVs can cause accelerated soil erosion, even on flat land.[20] This statement produced the second smallest number of "Match" answers with 42 or 18.8 percent. One hundred-eighteen respondents' answers (52.9%) did not match. TABLE XXIVa (see page 74) shows that 59 respondents (26.5%) answered "No Opinion/Not Know." TABLE XXIVb (see page 74) shows that after removing the "No Opinion/Not Know" responses, 25.4 percent of the remaining responses matched and 75.6 percent did not match the available literature.

Statement #10 was, "ORV use on a river bed has little effect on the environment of the river." When ORVs are used on a river bed, the environment of the river can be drastically changed.[21] Of the total 223 respondents, 45 (20.1%) responses matched the available literature (see TABLE XXVa, page 75). One hundred twenty-nine (57.8%) of the responses did not match. Forty-nine (22.0%) of the respondents

answered as "No Opinion/Not Know." TABLE XXX (see page 81) shows that other than Statement #1, this statement and the previous statement produced the two lowest percentages of matching answers. After extracting the "No Opinion/Not Know" responses, 74.1 percent answers did not match. This left the remaining 25.9 percent as answers that match (see TABLE XXVb, see page 75).

TABLE XXIVa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #9: "ORV USE CAUSES SOIL EROSION ON FLAT LAND."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	5	2.2	2.3
Agree	37	16.6	19.2
No Opinion\Not Know	59	26.5	46.1
Disagree	69	30.9	77.6
Strongly Disagree	49	22.0	100.0
Missing	4	1.8	Missing
Total	223	100.0	

TABLE XXIVb

STATEMENT #9 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	42	26.3
No Match	118	73.7
Total	160	100.0

No Opinion/Not Know n = 59

TABLE XXVa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #10: "ORV USE ON A RIVER BED HAS LITTLE EFFECT ON THE ENVIRONMENT OF THE RIVER."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	50	22.4	22.4
Agree	79	35.4	57.8
No Opinion\Not Know	49	22.0	79.8
Disagree	40	17.9	97.8
Strongly Disagree	5	2.2	100.0
Total	223	100.0	

TABLE XXVb

STATEMENT #10 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	45	25.9
No Match	129	74.1
Total	174	100.0

No Opinion/Not Know n = 49

Statement #11 was, "ORVS can only harm birds when they are nesting." Bury explains that ORVs can harm birds at times other than when nesting.[22] Eighty-three respondents (37.2%) answered as "Disagree" or "Strongly Disagree" with the statement (see TABLE XXVIa, page 76). Fifty-five respondents (24.7%) answered as "Strongly Agree" or "Agree." Statement #11 produced the largest number of "No Opinion/Not

Know" responses of Statement #1 through Statement #14, with 84 or 38.1 percent of the responses. TABLE XXVIb shows that 60.1 percent of the responses matched, after removing the "No Opinion/Not Know" answers. The remaining 39.9 percent of the answers did not match.

TABLE XXVIa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #11: "ORVS CAN ONLY HARM BIRDS WHEN THEY ARE NESTING."

Response	Frequency	Percent	Cum.Percent
Strongly Agree	4	1.8	1.8
Agree	51	22.9	24.7
No Opinion\Not Know	85	38.1	62.8
Disagree	62	27.8	90.6
Strongly Disagree	21	9.4	100.0
Total	223	100.0	

TABLE XXVIb

STATEMENT #11 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	83	60.1
No Match	55	39.9
Total	138	100.0

No Opinion/Not Know n = 85

Statement #12 was, "Two-wheel, three-wheel, and four-wheel drive ORVs all have similar impacts on the environment." Due to the width of tires, weight of vehicle, and other factors, two-wheel, three-wheel, and four-wheel vehicles do not have similar impacts on the environment.[23] Fifty-one respondents (22.8%) answered Statement #12 with matching answers (see TABLE XXVIIa). Of the 223 responses, 134 or 60.4 percent answers did not match. The "No Opinion/Not Know" responses were 16.6 percent of the total, or 37 responses. After removing the "No Opinion/Not Know" responses from the total, 27.6 percent responded to the statement with matching answers, while 72.4 percent responded with answers that did not match (see TABLE XXVIIb, page 78).

TABLE XXVIIa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #12: "TWO-WHEEL, THREE-WHEEL, AND FOUR-WHEEL DRIVE ORVS ALL HAVE SIMILAR IMPACTS ON THE ENVIRONMENT."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	35	15.7	15.8
Agree	99	44.4	60.4
No Opinion\Not Know	37	16.6	77.0
Disagree	34	15.2	92.3
Strongly Disagree	17	7.6	100.0
Missing	1	0.4	Missing
Total	223	100.0	

TABLE XXVIIb

STATEMENT #12 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	51	27.6
No Match	134	72.4
Total	185	100.0

No Opinion/Not Know n = 37

Statement #13 was, "Knobby tires cause more damage than balloon tires." Initial research indicated that balloon tires caused more damage than knobby tires because of the increased amount of contact with a surface. Actually, either can be equally damaging, depending on slope of land, wheelspin, soil type, and other factors.[24] The responses are reported here, but are not grouped with Statement #1 through Statement #14. Either an agreement or a disagreement would be an appropriate response.

In to relation Statement #13, 36.8 percent "Strongly Agree" or "Agree" that knobby tires cause more damage than balloon tires. Those that answered "Disagree" or "Strongly Disagree" were 35 percent. The remaining 27.8 percent responded as "No Opinion\Not Know" (see TABLE XXVIII, page 79).

TABLE XXVIII

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #13: "KNOBBY TIRES CAUSE MORE DAMAGE THAN BALLOON TIRES."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	25	11.2	11.3
Agree	57	25.6	36.9
No Opinion\Not Know	62	27.8	64.9
Disagree	45	20.2	85.1
Strongly Disagree	33	14.8	100.0
Missing	1	0.4	Missing
Total	223	100.0	

Statement #14 was, "ORV use strips vegetation from the soil." This was the final statement on the knowledge of ORVs' impact on the environment. Because of many factors, ORVs do strip vegetation from the soil.[25]

The "Match" responses were the highest of Statement #1 through #14, 118 or 52.9 percent (see TABLE XXIXa, page 80). Forty-seven respondents (25.1%) answered with non-matching responses. Only 49 respondents (22.0%) answered as "No Opinion/Not Know." When the "No Opinion/Not Know" responses were removed, 67.8 percent answered with matching responses, and 32.2 percent answered with non-matching responses (see TABLE XXIXb, page 80).

TABLE XXIXa

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #14: "ORV USE STRIPS VEGETATION FROM THE SOIL."

	Frequency	Percent	Cum. Percent
Strongly Agree	15	6.7	6.7
Agree	103	46.2	52.9
No Opinion\Not Know	49	22.0	74.9
Disagree	27	12.1	87.0
Strongly Disagree	29	13.0	100.0
Total	223	100.0	

TABLE XXIXb

STATEMENT #14 RESPONSES VS. LITERATURE

Response	Frequency	Percent
Match	118	67.8
No Match	56	32.2
Total	174	100.0

No Opinion/Not Know n = 49

TABLE XXX (see page 81) shows the total "Match," "No Match," "No Opinion/Not Know," and "Missing" responses from Statement #1 to Statement #14 combined, excluding Statement #13. Of the possible 2899 responses, 868 matched, 1366 did not match, 656 were "No Opinion/Not Know," and 9 were "Missing."

TABLE XXX

RESPONSES VS. LITERATURE: FREQUENCY OF MATCH, NO MATCH, NO OPINION/NOT KNOW, AND MISSING RESPONSES FOR STATEMENTS #1 THROUGH #14 (EXCLUDING #13)

Statement	Match	No Match	No Opinion/ Not Know	Missing
Statement #1	18	190	15	0
Statement #2	51	129	41	2
Statement #3	64	99	59	1
Statement #4	115	76	32	0
Statement #5	45	96	82	0
Statement #6	100	77	45	1
Statement #7	62	116	45	0
Statement #8	74	91	58	0
Statement #9	42	118	59	4
Statement #10	45	129	49	0
Statement #11	83	55	85	0
Statement #12	51	134	37	0
Statement #14	118	56	49	0
Totals	868	1366	656	9

Possible number of responses = 2899

TABLE XXXI (see page 82) shows the percentages of the total "Match" and "No Match"; first, with "No Opinion/Not Know" and "Missing" responses, and second without "No Opinion/Not Know" and "Missing" responses. With all responses tabulated together, 29.9 percent matched, 47.1 percent did not match, 22.6 percent were "No Opinion/Not Know," and 0.3 percent were "Missing." Removing the "No Opinion/Not Know" and "Missing" responses, 38.9 percent matched and 61.1 percent did not match.

TABLE XXXI

RESPONSES VS. LITERATURE: CUMULATIVE PERCENTAGES OF MATCH AND NO MATCH, WITH AND WITHOUT NO OPINION/NOT KNOW AND MISSING

WITH/WITHOUT	Match	No Match	No Opin/ Not Know	Missing	Pct.
WITH: No Opinion/Not Know, Missing	29.9%	47.1%	22.6%	0.3%	100%
WITHOUT: No Opinion/Not Know, Missing	38.9%	61.1%	N/A	N/A	100%

Data Related to Off-Road Vehicle Users' Acceptance of Consequences

Statements #15, #16, #17, and #19, asked the respondents if they considered a specific or general adverse impact on the environment by ORV use was an acceptable consequence of ORV use. Statement #18 asked the respondent if they believed that the ORV users should pay for management of the ORV area.

TABLE XXXII (see page 83) shows the responses to Statement #15. The statement was, "Assuming that ORVs cause soil erosion, this is an acceptable consequence of ORV use." Fifteen responded "Strongly Agree" to this statement, 72 responded "Agree," and 88 responded "No Opinion/Not Know," 6.7 percent, 32.3 percent, and 39.5 percent respectively. Of the remaining 47 responses, 24 were "Disagree" and 23

were "Strongly Disagree," 10.8 percent and 10.3 percent respectively. This statement produced the highest number of "No Opinion/Not Know responses" of the acceptance of consequences statements.

TABLE XXXII

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #15: "ASSUMING THAT ORVS CAUSE SOIL EROSIONS, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	15	6.7	6.8
Agree	72	32.3	39.2
No Opinion\Not Know	88	39.5	78.8
Disagree	24	10.8	89.6
Strongly Disagree	23	10.3	100.0
Missing	1	0.4	Missing
Total	223	100.0	

Statement #16 was, "Assuming that ORVs cause loss of vegetation, this is an acceptable consequence of ORV use." Of the possible 223 responses, 9 were "Strongly Agree," 77 were "Agree," 76 were "No Opinion/Not Know," 33 were "Disagree," 25 were "Strongly Disagree," and 3 were "Missing." The percentages were, in order, 4.0 percent, 34.5 percent, 34.1 percent, 14.8 percent, 11.2 percent, and 1.3 percent (see TABLE XXXIII, page 84).

TABLE XXXIII

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #16: "ASSUMING THAT ORVS CAUSE LOSS OF VEGETATION, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	9	4.0	4.1
Agree	77	34.5	39.1
No Opinion\Not Know	76	34.1	73.6
Disagree	33	14.8	88.6
Strongly Disagree	25	11.2	100.0
Missing	3	1.3	Missing
Total	223	100.0	

Statement #17 resulted in the second highest number of "No Opinion/Not Know" responses with 85, or 38.6 percent (see TABLE XXXIV, page 85). The statement was, "Assuming that ORV use causes the loss of wildlife in an area, this is an acceptable consequence of ORV use." Thirteen (5.8%) responded "Strongly Agree" to this statement, while 47 (21.1%) "Agree." Forty-seven (21.1%) responded "Disagree," and 30 (13.5%) "Strongly Disagree." This statement produced the highest number of "Disagree" or "Strongly Disagree" with 77 responses, or 36.6 percent.

Statement #18 stated the following, "ORV users should pay for management of specific areas to be used by their vehicles." Of the 223 responses, only 30 (13.5%) were "No Opinion/Not Know" (see TABLE XXXV, page 85). The remaining responses were split somewhat evenly. Twenty-three (10.3%) responded "Strongly Agree," and 79 (35.4%) "Agree" to the

statement. Forty respondents (17.9%) answered "Strongly Disagree," and 51 respondents (22.9%) were "Disagree." Combining the "Strongly Agree" with the "Agree," and the "Strongly Disagree" with the "Disagree," produces combined results of 45.7 percent and 40.8 percent respectively.

TABLE XXXIV

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #17: "ASSUMING THAT ORV USE CAUSES THE LOSS OF WILD-LIFE IN AN AREA, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	13	5.8	5.8
Agree	47	21.1	26.9
No Opinion\Not Know	86	38.6	65.5
Disagree	47	21.1	86.5
Strongly Disagree	30	13.5	100.0
Total	223	100.0	

TABLE XXXV

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #18: "ORV USERS SHOULD PAY FOR MANAGEMENT OF SPECIFIC AREAS TO BE USED BY THEIR VEHICLES."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	23	10.3	10.3
Agree	79	35.4	45.7
No Opinion\Not Know	30	13.5	59.2
Disagree	51	22.9	82.1
Strongly Disagree	40	17.9	100.0
Total	223	100.0	

The final statement (#19) was, "Any impacts of ORV use in this area are acceptable." This produced the highest number of "Agree" or "Strongly Agree" in response to Statement #15 through Statement #19. Sixty-eight (30.5%) "Strongly Agree," and 94 (42.2%) "Agree" with the statement (see TABLE XXXVI). Of the total 223 responses, 162 (72.7%) were "Agree" or "Strongly Agree." This produced the lowest number of "No Opinion/Not Know" responses to Statement #15 through Statement #19, with 25 (11.2%) responses. Thirty-one (13.9%) were "Disagree," and 5 (2.2%) were "Strongly Disagree."

TABLE XXXVI

RESPONSES AND FREQUENCY MEASURES FOR STATEMENT #19: "ANY IMPACTS OF ORV USE IN THIS AREA ARE ACCEPTABLE."

Response	Frequency	Percent	Cum. Percent
Strongly Agree	68	30.5	30.5
Agree	94	42.2	72.6
No Opinion\Not Know	25	11.2	83.9
Disagree	31	13.9	97.8
Strongly Disagree	5	2.2	100.0
Total	223	100.0	

TABLE XXXVII (see page 87) shows the four statements (#15, #16, #17, & #19) related to the acceptance of adverse environmental impact grouped together. Of the total 892

responses, 11.8 percent were "Strongly Agree," 32.5 percent were "Agree," 30.8 percent were "No Opinion/Not Know," 15.1 percent were "Disagree," and 9.3 percent were "Strongly Disagree." The "Missing" responses were 0.4 percent of the total. The highest percentage of responses for these four statements grouped together was "Agree," with 32.5 percent of the 892 responses. The second highest response was "No Opinion/Not Know," with 30.8 percent of the responses.

TABLE XXXVII

RESPONSES AND FREQUENCY MEASURES FOR STATEMENTS #15, #16, #17 AND #19

Statement	S.A.	Agr.	N.O.	Dis.	S.D.	Mis.
Statement #15	15	72	88	24	23	1
Statement #16	9	77	76	33	25	3
Statement #17	13	47	86	47	30	0
Statement #19	68	94	25	31	5	0
Total: n =	105	290	275	135	83	4
Percentage	11.8	32.5	30.8	15.1	9.3	0.4

S.A. = Strongly Agree
Agr. = Agree
N.O. = No Opinion/Do Not Know
Dis. = Disagree
S.D. = Strongly Disagree
Mis. = Missing

n = 892

TABLE XXXVIII (see page 88) shows the frequency measures for those who expressed an opinion, omitting "No Opinion/Not Know" and "Missing." Then the "Strongly Agree"

and the "Agree" responses were combined, and the "Disagree" and "Strongly Disagree" were combined, with percentages calculated for both. With the "No Opinion/Not Know" and "Missing" responses removed, responses that were "Strongly Agree" or "Agree" were 64.4 percent. The percent of the responses that were "Disagree" or "Strongly Disagree" was 35.5 percent of the 613 remaining responses.

TABLE XXXVIII

UNCOMBINED AND COMBINED RESPONSES AND FREQUENCY MEASURES FOR STATEMENTS #15, #16, #17, AND #19 (EXCLUDING NO OPINION/NOT KNOW AND MISSING RESPONSES)

Freq./Pct.	S.A.	Agr.	Dis.	S.D.
Frequency	105	290	135	83
Percent	17.1	47.3	22.0	13.5
Frequency (Combined)	395		218	
Percent (Combined)	64.4		35.5	

S.A. = Strongly Agree
Agr. = Agree
Dis. = Disagree
S.D. = Strongly Disagree

n = 613

Data Related to Hypotheses Testing

Crosstabulations were run for demographic variables by responses to Statements #1 through #19. The thirteen demographic variables were: (1) date of survey, (2) time of survey, (3) location of survey, (4) gender, (5) driver or passenger, (6) type of ORV used, (7) age, (8) race/ethnicity, (9) employment status, (10) education level, (11) years operating ORVs, (12) member of an ORV club, and (13) income level. Six of the thirteen demographic variables (gender, race, driver or passenger, member of an ORV club, type of ORV used, and location of survey) produced crosstabulation results with cell expectancy frequencies less than 5 for 10 percent or more of the cells. Therefore, the significance level of these six variables was not reliable.

Of the remaining seven demographic variables, date and time of survey are not reported. There is no research basis or logical reasoning that would indicate there should be a reason to find significant differences.

The five remaining variables (age, employment status, education level, years operating ORVs, and income level) were crosstabulated with Statement #1 through #19 to determine if differences were significant at the $\alpha = 0.05$. Of the ninety-five possible crosstabulations, only six were found to be significant. These are reported in TABLE XXXIX through TABLE XXXXIV. When factorial error is taken into

account, none of the crosstabulations where significant at the $\alpha = 0.0025$ level.

Each demographic variable was divided into subcategories based upon (1) available research, (2) natural division of the groups based on responses, or (3) by logical inference. The responses "Strongly Agree" and "Agree" were grouped together, as were the responses "Disagree" and "Strongly Disagree."

The effect of age produced one crosstabulation with a significant level. Effect of age by the responses to Statement #5, "ORV use has no effect on the soil's ability to absorb water," resulted in a significance level of 0.0319 (see TABLE XXXIX, page 91).

The effect of employment status resulted in one crosstabulation with a significant level of less than 0.05. Responses to Statement #5, "ORV use has no effect on the soil's ability to absorb water," crosstabulated with the effect of employment status resulted in a significance level of 0.05 (see TABLE XXXX, page 92).

The effect of years of education produced two crosstabulations with significance levels of less than 0.05. First, the effect of years of education by the responses to Statement #12, "Two-wheel, three-wheel, and four-wheel drive ORVs all have similar impacts on the environment," had a significance level of 0.0362 (see TABLE XXXXI, page 93). Second, the effect of years of education by responses to Statement #17, "Assuming that ORV use causes the loss of

wildlife in an area, this is an acceptable consequence of ORV use," produced a significance level of 0.037 (see TABLE XXXXII, page 94).

TABLE XXXIX

EFFECT OF AGE BY RESPONSES TO STATEMENT #5: "ORV USE HAS NO EFFECT ON THE SOIL'S ABILITY TO ABSORB WATER"

AGE — COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #5 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER	17 54.8 17.7 7.6	8 25.8 9.8 3.6	6 19.4 13.3 2.7	31 13.9
20 TO 29	48 42.9 50.0 21.2	35 31.3 42.7 15.7	29 25.9 64.4 13.0	112 50.2
30 AND OLDER	31 38.8 32.3 13.9	39 48.8 47.6 17.5	10 12.5 22.2 4.5	80 35.9
COLUMN TOTAL	96 43.0	82 36.8	45 20.2	223 100.0

Raw chi-square = 10.56939 with 4 df $p < 0.0319$

TABLE XXXX

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #5:
"ORV USE HAS NO EFFECT ON THE SOIL'S
ABILITY TO ABSORB WATER.

EMPLOYMENT STATUS — COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #5 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	67 43.8 69.8 30.2	62 40.5 75.6 27.9	24 15.7 54.5 10.8	153 68.9
NOT EMPLOYED FULL-TIME	29 42.0 30.2 13.1	20 29.0 24.4 9.0	20 29.0 45.5 9.0	69 31.1
COLUMN TOTAL	96 43.2	82 36.9	44 19.8	222 100.0

Raw chi square = 5.99151 with 2 df $p < 0.0500$

TABLE XXXXI

EFFECT OF EDUCATION LEVEL BY RESPONSES TO STATEMENT #12: "TWO-WHEEL, THREE-WHEEL, AND FOUR-WHEEL VEHICLES ALL HAVE SIMILAR IMPACTS ON THE ENVIRONMENT"

EDUCATION LEVEL / COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #5 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	66 62.3 49.3 29.7	11 10.4 29.7 5.0	29 27.4 56.9 13.1	106 47.7
MORE THAN HIGH SCHOOL	68 58.6 50.7 30.6	26 22.4 70.3 11.7	22 19.0 43.1 9.9	116 52.3
	134 60.4	37 16.7	51 23.0	222 100.0

Raw chi-square = 6.63472 with 2 df $p < 0.0362$

TABLE XXXXII

EFFECT OF EDUCATION LEVEL BY RESPONSES TO STATEMENT #17: "ASSUMING THAT ORV CAUSES THE LOSS OF WILDLIFE IN AN AREA, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE"

EDUCATION LEVEL / COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #17 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	32 29.9 53.3 14.3	32 29.9 37.2 14.3	43 40.2 55.8 19.3	107 48.0
MORE THAN HIGH SCHOOL	28 24.1 46.7 12.6	54 46.6 62.8 24.2	34 29.3 44.2 15.2	116 52.0
	60 26.9	86 38.6	77 34.5	223 100.0

Raw chi-square = 6.59404 with 2 df $p < 0.0370$

Crosstabulations with the demographic variable, number of years operating on ORV, produced no results of a significant level.

The demographic variable level of income produced two results of significance. The effect of income by the responses to Statement #7, "ORVs destroy vegetation by running over the stems and roots," produced a significance level of 0.0028 (see TABLE XXXXIII, page 95). And, the effect of income by the responses to Statement #11, ORVs can only harm animals by running over the animals," produced a significance level of 0.017 (see TABLE XXXXIV, page 96).

TABLE XXXXIII

EFFECT OF INCOME BY RESPONSES TO STATEMENT #7:
"ORVS DESTROY VEGETATION BY RUNNING
OVER THE STEMS AND ROOTS"

INCOME	STATEMENT #7 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	32 33.3 33.3 14.9	28 29.2 63.6 13.0	36 37.5 48.0 16.7	96 44.7
OVER $25,001	64 53.8 66.7 29.8	16 13.4 36.4 7.4	39 32.8 52.0 18.1	119 55.3
	96 44.7	44 20.5	75 34.9	215 100.0

Raw chi-square = 11.73322 with 2 df p < 0.0028

TABLE XXXXIV

EFFECT OF INCOME BY RESPONSES TO STATEMENT #11: "ORVS CAN ONLY HARM ANIMALS BY RUNNING OVER THE ANIMALS"

INCOME	STATEMENT #11 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	40 41.2 35.7 18.5	23 23.7 52.3 10.6	34 35.1 56.7 15.7	97 44.9
OVER $25,001	72 60.5 64.3 33.3	21 17.6 47.7 9.7	26 21.8 43.3 12.3	119 55.1
	112 51.9	44 20.4	60 27.8	216 100.0

Raw chi-square = 8.14418 with 2 df $p < 0.0170$

The RELIABILITY procedure in SPSS^{x} was applied to produce a CRONBACH ALPHA score of reliability for Statement #1 through Statement #19. A raw CRONBACH ALPHA for the nineteen statements was computed at 0.6038. A standardized item ALPHA was computed at 0.6104. This indicates a satisfactory reliability among the nineteen statements.

Summary

The collection of the data, the analysis, and the synthesis of the results suggest several areas in which judgmental concerns may need to be addressed. These areas

are briefly noted here to assure that attention is given to them and to their possible significance.

The demographics suggest that the ORV users were primarily white males between 20 and 29 years of age. Motorcycles accounted for a little over 50 percent of the vehicles. Typically, the users were fully employed and members of ORV clubs. Any effort to educate this group could start with a fairly well defined target.

Further, since there seemed to be minimal awareness or a lack of concern for environmental impact of ORV use, this may suggest that this is an area where user desire for recreational use and land managers desire to protect the environment will be a continuing source of conflict.

The responses of ORV users did not reflect the position of the current literature and over 70 percent indicated that they believed, "ORV use causes no harm to the environment." This result should be compared with the responses that indicated 80 percent did believe that soil erosion was an acceptable consequence of ORV use or indicated no opinion or did not know. This lack of information or lack of concern appears to be repeated in the responses to other statements.

The data may suggest that management may need to rethink its policies on land allocations based on user awareness and commitment to environmental impact problems. Chapter 5 gives details and specific suggestions relative to the data presented in this chapter.

ENDNOTES

[1]A. E. Keir Nash, "Nature Aesthetics, the Public Interest, and ORV Users' Perspectives," in Off-Road Vehicle Use--A Management Challenge, ed. Richard N. L. Andrews and Paul F. Nowak (Washington, D.C.: U.S. Department of Agriculture and University of Michigan, 1980), pp. 16-17.

[2]Ibid., p 17.

[3]Ibid., p. 16.

[4]U.S. Bureau of the Census, Statistical Abstract of the United States: 1990, 110th ed., (Washington, D.C.: Government Printing Office, 1990), p. 12.

[5]Ibid.

[6]Ibid., p. 18.

[7]U.S. Bureau of the Census, p. 378.

[8]Ibid., p 19.

[9]Ibid., p. 18-19.

[10]U.S. Bureau of the Census, p. 450.

[11]Robert Badacarro, "ORVs: Often Rough on Visitors," Parks and Recreation, September 1976, p. 35.

[12]T. Weaver and D. Dale, "Trampling Effects of Hikers, Motorcycles and Horses in Meadows and Forest," Journal of Applied Ecology, 1978, pp. 453-456.

[13]Robert H. Webb and Howard G. Wilshire, eds., Environmental Effect of Off-Road Vehicles: Impacts and Management in Arid Regions (New York: Spring-Verlag, 1983), pp. 26.

[14]Haynes B. Mahoney, "Dune Busting: How Much Can Our Beaches Bear?" Sea Frontiers, November-December 1980, pp. 326-328.

[15]Richard L. Bury, Robert C. Wendling, and Stephen F. McCool, Off-Road Recreation Vehicles--A Research Summary, 1969-1975, (Texas Agriculture Experimental Station: Texas A & M University, June 1976), pp. 43-47.

[16]Webb and Wilshire, p. 67.

[17]Howard G. Wilshire, Susan Shipley, and J. K. Nakata, "Impacts of Off-Road Vehicles on Vegetation," in Transactions of the Forty-third North American Wildlife and Natural Resource Conference Held in Phoenix, Arizona 18-22 March 1978, ed. Kenneth Sabol (Washington, D.C.: Wildlife Management Institute, 1978), p. 131.

[18]Robert C. Stebbins, "The Fragile Desert," American West, September 1974, pp. 296-298.

[19]Mahoney, pp. 326-328.

[20]Webb and Wilshire, p. 26.

[21]Dave Foreman, "ORVs Threaten a Wild Canyon," Living Wilderness, September 1979, p. 14.

[22]R. Bruce Bury, "What We Know and Do Not Know About Off-Road Vehicle Impacts on Wildlife," in Off-Road Vehicles Use: A Management Challenge, ed. Richard N. L. Andrews and Paul F. Nowak (Washington, D.C.: U.S. Department of Agriculture and University of Michigan, 1980), p. 115.

[23]Webb and Wilshire, p. 412.

[24]Webb and Wilshire, p. 59.

[25]Weaver and Dale, p. 453.

CHAPTER V

SUMMARY, RESULTS, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The number of off-road vehicles (ORVs) increases every year. There are over ten million off-road vehicles used by over forty million Americans in the United States.[1] In Oklahoma alone for example, there are over one million dirt bikes. Because the ORV users can be identified as a distinct group of individuals, it is important for public and private land managers to have information concerning these vehicle users.

This study was designed to ascertain ORV users', in Oklahoma, knowledge of ORVs' impact upon the environment; identify their opinions on whether an adverse impact upon the environment is an acceptable consequence of ORV use; and identify their opinions about whether management of ORV use areas should be paid for by the ORV users. In addition, this study was designed to ascertain if any demographic variables have a relationship to the previously mentioned factors.

Literature indicates ORVs have an impact on all segments of the environment. ORV use damages soil,

vegetation, sand dunes, water environments, air quality, and wildlife and their habitats. Literature on ORV users' knowledge of environmental impact is limited.

The data collection instrument for this study was a questionnaire. The first fifteen questions pertained to the demographics of the subject. Then the subjects were asked to respond to statements in an effort to ascertain the subjects' (1) knowledge of ORVs' impact upon the environment; (2) acceptance of adverse environmental impact caused by ORVs, and (3) opinions whether management of ORV use areas should be paid for by the ORV users.

Subjects were randomly selected at nine ORV locations in Oklahoma. Each site was randomly assigned a date at which the surveys were conducted. Each day the survey was conducted, subjects were selected from 10:00 a.m. until 7:00 p.m.. Every third vehicle was stopped and asked to participate in the study.

After the data was collected, statistical procedures were applied. All hypotheses were tested for significance at the $\alpha = 0.05$ level. SPSS^{X} CROSSTABS procedures were applied to the data.

Results

The results of the statistical analysis provided the following findings in relation to the problem statements discussed in Chapter I:

1. Relative to the fourteen statements on knowledge of environmental impact, 29.9 percent of the responses matched the position taken in the literature, 47.1 percent did not match, 22.6 percent had no opinion or did not know, and 0.3 percent of the responses were missing.

2. Relative to the four statements (combined) on whether the respondents believed that adverse impacts on the environment by ORV use was an acceptable consequence, 11.8 percent strongly agreed, 32.5 percent agreed, 30.8 percent had no opinion or did not know, 15.1 percent disagreed, 9.3 percent strongly disagreed, and 0.4 percent were missing.

3. Relative to the statement on whether the respondents believed that they should pay for management of ORV use areas, 10.3 percent strongly agreed, 35.4 percent agreed, 13.5 percent had no opinion or did not know, 22.9 percent disagreed, and 17.9 percent disagreed.

4. There is no significant difference of knowledge for ORV impact upon the environment regardless of, date of survey, time of survey, location of survey, gender, passenger or driver of the ORV, type of ORV vehicle used, age, race/ethnicity, employment status, years of formal education, years operating an ORV, membership in an organized ORV club, or household income.

5. There is no significant difference in acceptance of consequence of the adverse effect of ORV use impact upon the environment, regardless of ORV user demographics.

6. There is no significant difference of opinions on whether ORV users should pay for management of specific ORV use areas, regardless of ORV user demographics.

Another result of the study is the finding that the "typical" ORV user (in Oklahoma) is male, twenty-five years old, white, has thirteen years of education, and an annual household income probably around $25,000. He is employed full-time, a member of an organized ORV club, most likely to be operating a motorcycle, and has been an ORV user four years. The measures of median and mode were used for the appropriate demographic characteristic.

Conclusions

The following conclusions were made, taking into consideration the related literature, and the limitations, delimitations and results of the study. These conclusions are as neutral and impartial as possible.

1. The majority of off-road vehicle users, in Oklahoma, do not realize the extent of damage that the use of ORVs have on wildlife, soil, vegetation, sand dunes, water environments, and the environment as a whole. They are not aware that the use of their vehicles has a negative impact on non-ORV users.

2. The majority of off-road vehicle users, in Oklahoma, believes that soil erosion, loss of wildlife, loss of vegetation, and any impact to the environment are acceptable consequences of ORV use.

3. Off-road vehicle users, in Oklahoma, are divided on whether they should pay for the management of off-road vehicle use areas.

4. Users of off-road vehicles in Oklahoma have similar demographic characteristics when compared to other off-road vehicle users in other parts of the United States.

5. Individual demographics have no relationship on whether a person would or would not have knowledge that ORVs have a negative impact the environment.

6. Individual demographics have no relationship on whether a person would or would not believe that environmental impacts caused by ORVs are an acceptable consequence of ORV use.

7. Individual demographics have no relationship on whether a person would or would not believe that ORV users should pay for the management of ORV use areas.

Recommendations

Based on related literature, and the limitations, delimitations and results of the study, the following recommendations are made:

1. Land managers of off-road vehicle use areas should be made aware of the ORV users' demographics, knowledge, and attitudes. The land managers can use this information as part of the decision-making process.

2. Off-road vehicle users should be informed of the environmental impacts of their vehicles. This indicates an

information and educational program targeting ORV users as a group. This program could be conducted by the land managers of ORV use areas through printed media or dissemination of information to ORV clubs, and civic and service organizations.

3. This study should be replicated to validate the collection instrument and the statistical results, and should be replicated in other regions of the United States to examine whether the region one lives in has an influence on the environmental impact knowledge level or the attitudes of ORV users.

4. Other collection instruments should be designed to determine whether they would produce different results.

5. Other ways of collecting data (such as interviews or mailed questionnaires) should be developed to determine whether they would produce different results.

6. Comparison studies should be conducted to measure environmental impact knowledge level and attitudes between ORV users and non-ORV users. It may be important to know if non-ORV users have the same knowledge level or attitudes of the ORV users.

ENDNOTES

[1]David Sheridan, Off-road Vehicles on Public Lands, Council on Environmental Quality (Washington, D.C.: Government Printing Office, 1979), pp. 2-3.

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APPENDICES

APPENDIX A

RESEARCH QUESTIONNAIRE

Hello, I am Mark Reynolds from Oklahoma State University. I am gathering information about off-road vehicle users in Oklahoma for use in my dissertation.

INFORMED CONSENT STATEMENT

Your participation in this interview is voluntary. There are no penalties for not answering some or all of the questions, but since each interviewed person will represent many others who will not be interviewed, your cooperation is extremely important.

Participation in this survey is voluntary, and no data collected will be personally identifiable.

Would you be willing to answer a few questions today? The survey will take about 5 minutes.

REYNOLDS' ORV USERS SURVEY
OKLAHOMA STATE UNIVERSITY

DATE __ - __ - 88 TIME __ __:__ __ LOCATION NUMBER __

(Please circle or fill in the correct answer)

1. SEX -- M or F (circle one)

2. DRIVER OR PASSENGER (circle one)

3. Type of ORV (circle one)
   1. Motorcycle
   2. 4-wheel drive vehicle
   3. 3-wheel ATV
   4. 4-wheel ATV
   5. Dune buggy
   6. OTHER (fill in blank)_____

4. AGE IN YEARS (fill-in) __ __

5. RACE/ETHNICITY (circle one)
   1. White
   2. Black
   3. Hispanic
   4. Asian
   5. American Indian
   6. Other (fill in blank)_____

6. EMPLOYMENT STATUS (circle one)
   1. Employed full-time
   2. Employed part-time
   3. Self-employed
   4. Student
   5. Homemaker
   6. Retired
   7. Unemployed

7. NUMBER OF YEARS OF FORMAL EDUCATION (fill in blank) __ __

8. PRESENT RESIDENCE (fill in blanks)_____,_____
   (city, state)

9. ZIP __ __ __ __ __

10. YEARS OF OPERATING ORVs (fill in blank) _____

11. I AM A MEMBER OF AN ORGANIZED ORV CLUB YES or NO

12. INCOME FOR HOUSEHOLD LAST YEAR (circle one)
   1. UNDER $15,000
   2. $15,001 to $25,000
   3. $25,001 to $35,000
   4. $35,001 to $45,000
   5. $45,001 to $55,000
   6. $55,001 to $65,000
   7. MORE THAN $65,001

In the following section, you will be given a statement and asked to respond to the statement. At the end of each statement circle the response that best reflects you true feeling.

1 = strongly agree with the statement
2 = agree with the statement
3 = have no opinion or do not know about the statement
4 = disagree with the statement
5 = strongly disagree with the statement

	STRONGLY AGREE	AGREE	NO OPINION/DO NOT KNOW	DISAGREE	STRONGLY DISAGREE
1. ORV use in designated areas has little effect on non-ORV users.	1	2	3	4	5
2. ORV use causes no harm to the environment.	1	2	3	4	5
3. ORV use in sand dunes has little effect on the sand dunes' vegetation	1	2	3	4	5
4. The noise caused by ORVs drive wildlife from the area.	1	2	3	4	5
5. ORV use has no effect on the soil's ability to absorb water.	1	2	3	4	5
6. ORVs destroy vegetation by running over the stems and roots.	1	2	3	4	5
7. ORVs can only harm animals by running over the animals.	1	2	3	4	5
8. ORVs driven on sand dunes can lead to erosion.	1	2	3	4	5
9. ORV use causes soil erosion on flat land.	1	2	3	4	5
10. ORV use on a river bed has little effect on the environment of the river.	1	2	3	4	5
11. ORVs can only harm birds when they are nesting	1	2	3	4	5
12. Two-wheel, three-wheel, and four-wheel ORVs all have similar impacts on the environment.	1	2	3	4	5
13. Knobby tires causes more damage than balloon tires.	1	2	3	4	5
14. ORV use strips vegetation from the soil.	1	2	3	4	5
15. Assuming that ORVs cause soil erosion, this is an acceptable consequence of ORV use.	1	2	3	4	5
16. Assuming that ORV use causes loss of vegetation, this is an acceptable consequence of ORV use.	1	2	3	4	5
17. Assuming that ORV use causes the loss of wildlife in an area, this is an acceptable consequence of ORV use.	1	2	3	4	5
18. ORV users should pay for management of specific areas to be used by their vehicles.	1	2	3	4	5
19. Any impacts of ORV use in this area are acceptable.	1	2	3	4	5

(REDUCED)

APPENDIX B

CONTINGENCY TABLES

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #1:
"ORV USE IN DESIGNATED AREAS HAS LITTLE EFFECT ON NON-ORV USERS."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #1: AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	134 87.9 70.9 60.4	10 6.5 66.7 4.5	9 5.9 50.0 4.1	153 68.9
NOT EMPLOYED FULL-TIME	55 79.7 29.1 24.8	5 7.2 33.3 2.3	9 13.0 50.0 4.1	69 31.1
COLUMN TOTAL	189 85.1	15 6.8	18 8.1	222 100.0

Raw chi square = 3.38929 with 2 df p < 0.1837
1 cell with E. F. < 5

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #2:
"ORV USE CAUSES NO HARM TO THE ENVIRONMENT."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #2: AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	87 57.2 68.0 39.5	29 19.1 70.7 13.2	39 23.7 70.6 16.4	152 69.1
NOT EMPLOYED FULL-TIME	41 60.3 32.0 18.6	12 17.6 29.3 5.5	15 22.1 29.4 6.8	68 30.9
COLUMN TOTAL	128 58.2	41 18.6	51 23.2	220 100.0

Raw chi square = 0.18071 with 2 df p < 0.9136

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #3:
"ORV USE IN SAND DUNES HAS LITTLE EFFECT ON THE SAND DUNES' VEGETATION.

EMPLOYMENT STATUS (COUNT / ROW PCT / COL PCT / TOT PCT)	STATEMENT #3 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	69 45.1 70.4 31.2	41 26.8 69.5 18.6	43 28.1 67.2 19.5	153 69.2
NOT EMPLOYED FULL-TIME	29 42.6 29.6 13.1	18 26.5 30.5 8.1	21 30.9 32.8 9.5	68 30.8
COLUMN TOTAL	98 44.3	59 26.7	64 29.0	221 100.0

Raw chi square = 0.19109 with 2 df p < 0.9089

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #4:
"THE NOISE CAUSED BY ORVS DRIVE WILD-LIFE FROM THE AREA.

EMPLOYMENT STATUS (COUNT / ROW PCT / COL PCT / TOT PCT)	STATEMENT #4 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	51 33.3 67.1 23.0	22 14.4 68.8 9.9	80 52.3 70.2 36.0	153 68.9
NOT EMPLOYED FULL-TIME	25 36.2 32.9 11.3	10 14.5 31.3 4.5	34 49.3 29.8 15.3	69 31.1
COLUMN TOTAL	76 34.2	32 14.4	114 51.4	222 100.0

Raw chi square = 0.20116 with 2 df p < 0.9043

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #5:
"ORV USE HAS NO EFFECT ON THE SOIL'S
ABILITY TO ABSORB WATER.

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #5 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	67 43.8 69.8 30.2	62 40.5 75.6 27.9	24 15.7 54.5 10.8	153 68.9
NOT EMPLOYED FULL-TIME	29 42.0 30.2 13.1	20 29.0 24.4 9.0	20 29.0 45.5 9.0	69 31.1
COLUMN TOTAL	96 43.2	82 36.9	44 19.8	222 100.0

Raw chi square = 5.99151 with 2 df p < 0.0500

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #6:
"ORVS DESTROY VEGETATION BY RUNNING
OVER THE STEMS AND ROOTS."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #6 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	70 45.8 70.0 31.7	33 21.6 73.3 14.9	50 32.7 65.8 22.9	153 69.2
NOT EMPLOYED FULL-TIME	30 44.1 30.0 13.6	12 17.6 26.7 5.4	26 38.2 34.2 11.8	68 60.8
COLUMN TOTAL	100 45.2	45 20.4	76 34.4	221 100.0

Raw chi square = 0.80585 with 2 df p < 0.6684

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #7:
"ORVS CAN ONLY HARM ANIMALS BY
RUNNING OVER THE ANIMALS."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #7 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	82 53.6 71.3 36.9	32 20.9 71.1 14.4	39 25.5 62.9 17.6	153 68.9
NOT EMPLOYED FULL-TIME	33 47.8 28.7 14.9	13 18.8 28.9 5.9	23 33.3 37.1 10.4	69 31.1
COLUMN TOTAL	115 51.8	45 20.3	62 27.9	222 100.0

Raw chi square = 1.45389 with 2 df p < 0.4834

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #8:
"ORVS DRIVEN ON SAND DUNES
CAN LEAD TO EROSION."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #8 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	52 34.0 70.3 23.4	39 25.5 67.2 17.6	62 40.5 68.9 27.9	153 68.9
NOT EMPLOYED FULL-TIME	22 31.9 29.7 9.9	19 27.5 32.8 8.6	28 40.6 31.1 12.6	69 31.1
COLUMN TOTAL	74 33.3	58 26.1	90 40.5	222 100.0

Raw chi square = 0.13932 with 2 df p < 0.9327

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #9:
"ORV USE CAUSE SOIL EROSION
ON FLAT LAND."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #9 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	30 19.9 71.4 13.8	42 27.8 71.2 19.3	79 52.3 67.5 36.2	151 69.3
NOT EMPLOYED FULL-TIME	12 17.9 28.6 5.5	17 25.4 28.8 7.8	38 56.7 32.5 17.4	67 30.7
COLUMN TOTAL	42 19.3	59 27.1	117 53.7	218 100.0

Raw chi square = 0.36177 with 2 df p < 0.8345

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #10:
"ORV USE ON A RIVER BED HAS LITTLE EFFECT
ON THE ENVIRONMENT OF THE RIVER."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #10 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	89 58.2 69.5 40.1	37 24.2 75.5 16.7	27 17.6 60.0 12.2	153 68.9
NOT EMPLOYED FULL-TIME	39 56.5 30.5 17.6	12 17.4 24.5 5.4	18 26.1 40.0 8.1	69 31.1
COLUMN TOTAL	128 57.7	49 22.1	45 20.3	222 100.0

Raw chi square = 2.68731 with 2 df p < 0.2609

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #11:
"ORVS CAN ONLY HARM BIRDS WHEN
THEY ARE NESTING."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #11 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	34 22.2 61.8 15.3	64 41.8 75.3 28.8	55 35.9 67.1 24.8	153 68.9
NOT EMPLOYED FULL-TIME	21 30.4 38.2 9.5	21 30.4 24.7 9.5	27 39.1 32.9 12.2	69 31.1
COLUMN TOTAL	55 24.8	85 38.3	82 36.9	222 100.0

Raw chi square = 3.03778 with 2 df p < 0.2190

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #12:
"TWO-WHEEL, THREE-WHEEL, AND FOUR-WHEEL
DRIVE ORVS ALL HAVE SIMILAR IMPACTS
ON THE ENVIRONMENT."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #12 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	92 60.5 68.7 41.6	26 17.1 70.3 11.8	34 22.4 68.0 15.4	152 68.8
NOT EMPLOYED FULL-TIME	42 60.9 31.3 19.0	11 15.9 29.7 5.0	16 23.2 32.0 7.2	69 31.2
COLUMN TOTAL	134 60.6	37 16.7	50 22.6	221 100.0

Raw chi square = 0.05338 with 2 df p < 0.9737

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #13:
"KNOBBY TIRES CAUSES MORE DAMAGE
THAN BALLOON TIRES."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #13 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	58 38.2 70.7 26.2	48 31.6 77.4 21.7	46 30.3 59.7 20.8	152 68.8
NOT EMPLOYED FULL-TIME	24 34.8 29.3 10.9	14 20.3 22.6 6.3	31 44.9 40.3 14.0	69 31.2
COLUMN TOTAL	82 37.1	62 28.1	77 34.8	221 100.0

Raw chi square = 5.23063 with 2 df $p < 0.0731$

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #14:
"ORV USE STRIPS VEGETATION FROM THE SOIL."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #14 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	78 51.0 66.1 35.1	37 24.2 75.5 16.7	38 24.8 69.1 17.1	153 68.9
NOT EMPLOYED FULL-TIME	40 58.0 33.9 18.0	12 17.4 24.5 5.4	17 24.6 30.9 7.7	69 31.1
COLUMN TOTAL	118 53.2	49 22.1	55 24.8	222 100.0

Raw chi square = 1.43178 with 2 df $p < 0.4888$

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #15:
"ASSUMING THAT ORVS CAUSE SOIL EROSIONS, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

EMPLOYMENT STATUS / COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #15 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	60 39.5 69.0 27.1	58 38.2 65.9 26.2	34 22.4 73.9 15.4	152 68.8
NOT EMPLOYED FULL-TIME	27 39.1 31.0 12.2	30 43.5 34.1 13.6	12 17.4 26.1 5.4	69 31.2
COLUMN TOTAL	87 39.4	88 39.8	46 20.8	221 100.0

Raw chi square = 0.90357 with 2 df p < 0.6365

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #16:
"ASSUMING THAT ORVS CAUSE LOSS OF VEGETATION, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

EMPLOYMENT STATUS / COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #16 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	66 43.7 76.7 30.1	47 31.1 61.8 21.5	38 25.2 66.7 17.4	151 68.9
NOT EMPLOYED FULL-TIME	20 29.4 23.3 9.1	29 42.6 38.2 13.2	19 27.9 33.3 8.7	68 31.1
COLUMN TOTAL	86 39.3	76 34.7	57 26.0	219 100.0

Raw chi square = 4.37259 with 2 df p < 0.1123

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #17:
"ASSUMING THAT ORV USE CAUSES THE LOSS OF WILDLIFE IN AN AREA, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

EMPLOYMENT STATUS / COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #17 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	41 26.8 68.3 18.5	60 39.2 69.8 27.0	52 34.0 68.4 23.4	153 68.9
NOT EMPLOYED FULL-TIME	19 27.5 31.7 8.6	26 37.7 30.2 11.7	24 34.8 31.6 10.8	69 31.1
COLUMN TOTAL	60 27.0	86 38.7	76 34.2	222 100.0

Raw chi square = 0.04731 with 2 df p < 0.9766

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #18: "ORV USERS SHOULD PAY FOR MANAGEMENT OF SPECIFIC AREAS TO BE USED BY THEIR VEHICLES."

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #18 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	67 43.8 65.7 30.2	21 13.7 70.0 9.5	65 42.5 72.2 29.3	153 68.9
NOT EMPLOYED FULL-TIME	35 50.7 34.3 15.8	9 13.0 30.0 4.1	25 36.2 27.8 11.3	69 31.1
COLUMN TOTAL	102 45.9	30 13.5	90 40.5	222 100.0

Raw chi square = 0.97243 with 2 df p < 0.6149

THE EFFECT OF EMPLOYMENT STATUS BY STATEMENT #19: "ANY IMPACTS OF ORV USE IN THIS AREA ARE ACCEPTABLE.

EMPLOYMENT STATUS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #19 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
EMPLOYED FULL-TIME	113 73.9 69.8 50.9	19 12.4 76.0 8.6	21 13.7 60.0 9.5	153 68.9
NOT EMPLOYED FULL-TIME	49 71.0 30.2 22.1	6 8.7 24.0 2.7	14 20.3 40.0 6.3	69 31.1
COLUMN TOTAL	162 73.0	25 11.3	35 15.8	222 100.0

Raw chi square = 1.93757 with 2 df p < 0.3795

THE EFFECT OF AGE BY STATEMENT #1: "ORV USE IN DESIGNATED AREAS HAS LITTLE EFFECT ON NON-ORV USERS."

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #1 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		25 80.6 13.2 11.2	2 6.5 13.3 .9	4 12.9 22.2 1.8	31 13.9
20 TO 29		92 82.1 48.4 41.3	8 7.1 53.3 3.6	12 10.7 66.7 5.4	112 50.2
30 AND OLDER		73 91.3 38.4 32.7	5 6.3 33.3 2.2	2 2.5 11.1 .9	80 35.9
COLUMN TOTAL		190 85.2	15 6.7	18 8.1	223 100.0

Raw chi square = 5.54365 with 4 df $p < 0.2359$
2 cells with E. F. < 5

THE EFFECT OF AGE BY STATEMENT #2: "ORV USE CAUSES NO HARM TO THE ENVIRONMENT."

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #2 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		23 74.2 17.8 10.4	4 12.9 9.8 1.8	4 12.9 7.8 1.8	31 14.0
20 TO 29		60 54.1 46.5 27.1	26 23.4 63.4 11.8	25 22.5 49.0 11.3	111 50.2
30 AND OLDER		46 58.2 35.7 20.8	11 13.9 26.8 5.0	22 27.8 43.1 10.0	79 35.7
COLUMN TOTAL		129 58.4	49 18.6	51 23.1	223 100.0

Raw chi square = 6.73382 with 4 df p < 0.1506

THE EFFECT OF AGE BY STATEMENT #3: "ORV USE IN SAND DUNES HAS LITTLE EFFECT ON THE SAND DUNES' VEGETATION.

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #3 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		15 50.0 15.2 6.8	10 33.3 16.9 4.5	5 16.7 7.8 2.3	30 13.5
20 TO 29		53 47.3 53.5 23.9	29 25.9 49.2 13.1	30 26.8 46.9 13.5	112 50.5
30 AND OLDER		31 38.8 31.3 14.0	20 25.0 33.9 9.0	29 36.3 45.3 13.1	80 36.0
COLUMN TOTAL		99 44.6	59 26.6	64 28.8	222 100.0

Raw chi square = 4.83572 with 4 df $p < 0.3046$

THE EFFECT OF AGE BY STATEMENT #4: "THE NOISE CAUSED BY ORVS DRIVE WILDLIFE FROM THE AREA.

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #4 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		9 29.0 11.8 4.0	5 16.1 15.6 2.2	17 54.8 14.8 7.6	31 13.9
20 TO 29		41 36.6 53.9 18.4	13 11.6 40.6 5.8	58 51.8 50.4 26.0	112 50.2
30 AND OLDER		26 32.5 34.2 11.7	14 17.5 43.8 6.3	40 50.0 34.8 17.9	80 35.9
COLUMN TOTAL		76 34.1	32 14.3	115 51.6	223 100.0

Raw chi square = 1.81246 with 4 df p < 0.7702
1 cell with E. F. < 5

THE EFFECT OF AGE BY STATEMENT #5: "ORV USE HAS NO EFFECT ON THE SOIL'S ABILITY TO ABSORB WATER.

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #5 AGREE	NO OPIN NOT KNOW	DISAGREE	ROAD TOTAL
NINETEEN OR YOUNGER		17 54.8 17.7 7.6	8 25.8 9.8 3.6	6 19.4 13.3 2.7	31 13.9
20 TO 29		48 42.9 50.0 21.2	35 31.3 42.7 15.7	29 25.9 64.4 13.0	112 50.2
30 AND OLDER		31 38.8 32.3 13.9	39 48.8 47.6 17.5	10 12.5 22.2 4.5	80 35.9
COLUMN TOTAL		96 43.0	82 36.8	45 20.2	223 100.0

Raw chi square = 10.56939 with 4 df $p < 0.0319$

THE EFFECT OF AGE BY STATEMENT #6: "ORVS DESTROY VEGETATION BY RUNNING OVER THE STEMS AND ROOTS."

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #6 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		10 33.3 10.0 4.5	9 30.0 20.0 4.1	11 36.7 14.3 5.0	30 13.5
20 TO 29		54 48.2 54.0 24.3	22 19.6 48.9 9.9	26 32.1 46.8 16.2	112 50.5
30 AND OLDER		36 45.0 36.0 16.2	14 17.5 31.1 6.3	30 37.5 39.0 13.5	80 36.0
COLUMN TOTAL		100 45.0	45 20.3	77 34.7	222 100.0

Raw chi square = 3.31441 with 4 df $p < 0.5067$

THE EFFECT OF AGE BY STATEMENT #7: "ORVS CAN ONLY HARM ANIMALS BY RUNNING OVER THE ANIMALS."

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #7 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		14 45.2 12.1 6.3	8 25.8 17.8 3.6	9 29.0 14.5 4.0	31 13.9
20 TO 29		65 58.0 56.0 29.1	19 17.0 42.2 8.5	28 25.0 45.2 12.6	112 50.2
30 AND OLDER		37 46.3 31.9 16.6	18 22.5 40.0 8.1	25 31.3 40.3 11.2	80 35.9
COLUMN TOTAL		116 52.0	45 20.2	62 27.8	223 100.0

Raw chi square = 3.52043 with 4 df p < 0.4748

THE EFFECT OF AGE BY STATEMENT #8: "ORVS DRIVEN ON SAND DUNES CAN LEAD TO EROSION."

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #8 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		7 22.6 9.5 3.1	13 41.9 22.4 5.8	11 35.5 12.1 4.9	31 13.9
20 TO 29		40 35.7 54.1 17.9	29 25.9 50.0 13.0	43 38.4 47.3 19.3	112 50.2
30 AND OLDER		27 33.8 36.5 12.1	16 20.0 27.6 7.2	37 46.3 40.7 16.6	80 35.9
COLUMN TOTAL		74 33.2	58 26.0	91 40.8	223 100.0

Raw chi square = 6.36465 with 4 df $p < 0.1735$

THE EFFECT OF AGE BY STATEMENT #9: "ORV USE CAUSES SOIL EROSION ON FLAT LAND."

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #9 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		6 19.4 14.3 2.7	7 22.6 11.9 3.2	18 58.1 15.3 8.2	31 14.2
20 TO 29		20 18.3 47.6 9.1	28 25.7 47.5 12.8	61 56.0 51.7 27.9	109 49.8
30 AND OLDER		16 20.3 38.1 7.3	24 30.4 40.7 11.0	39 49.4 33.1 17.8	79 36.1
COLUMN TOTAL		42 19.2	59 26.9	118 53.9	219 100.0

Raw chi square = 1.20341 with 4 df p < 0.8775

THE EFFECT OF AGE BY STATEMENT #10: "ORV USE ON A RIVER BED HAS LITTLE EFFECT ON THE ENVIRONMENT OF THE RIVER."

AGE	STATEMENT #10 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER	19 61.3 14.7 8.5	7 22.6 14.3 3.1	5 16.1 11.1 2.2	31 13.9
20 TO 29	66 58.9 51.2 29.6	24 21.4 49.0 10.8	22 16.9 48.9 9.9	112 50.2
30 AND OLDER	44 55.0 34.1 19.7	18 22.5 36.7 8.1	18 22.5 40.0 8.1	80 35.9
COLUMN TOTAL	129 57.8	49 22.0	45 20.2	223 100.0

Raw chi square = 0.71021 $p < 0.9501$

COUNT
ROW PCT
COL PCT
TOT CT

THE EFFECT OF AGE BY STATEMENT #11: "ORVS CAN ONLY HARM BIRDS WHEN THEY ARE NESTING."

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #11 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		7 22.6 12.7 3.1	13 41.9 15.3 5.8	11 35.5 13.3 4.9	31 13.9
20 TO 29		29 25.9 52.7 13.0	45 40.2 52.9 20.2	38 33.9 45.8 17.0	112 50.2
30 AND OLDER		19 23.8 34.5 8.5	27 33.8 31.8 12.1	34 42.5 41.0 15.2	80 35.9
COLUMN TOTAL		55 24.7	85 38.1	83 37.2	223 100.0

Raw chi square = 1.74428 with 4 df $p < 0.7827$

THE EFFECT OF AGE BY STATEMENT #12: "TWO-WHEEL, THREE-WHEEL, AND FOUR-WHEEL DRIVE ORVS ALL HAVE SIMILAR IMPACTS ON THE ENVIRONMENT."

AGE	STATEMENT #12 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER	23 74.2 17.2 10.4	3 9.7 8.1 1.4	5 16.1 9.8 2.3	31 14.0
20 TO 29	71 63.4 53.0 32.0	15 13.4 40.5 6.8	26 23.2 51.0 11.7	112 50.5
30 AND OLDER	40 50.6 29.9 18.0	19 24.1 51.4 8.6	20 25.3 39.2 9.0	79 35.6
COLUMN TOTAL	134 60.4	37 16.7	51 23.0	222 100.0

Raw chi square = 7.42883 $p < 0.1149$

THE EFFECT OF AGE BY STATEMENT #13: "KNOBBY TIRES CAUSES MORE DAMAGE THAN BALLOON TIRES."

AGE	STATEMENT #13 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER	12 38.7 14.6 5.4	4 12.9 6.5 1.8	15 48.4 19.2 6.8	31 14.0
20 TO 29	43 38.7 52.4 19.4	31 27.9 50.0 14.4	37 33.3 47.4 16.7	111 50.0
30 AND OLDER	27 33.8 32.9 12.2	27 33.8 43.5 12.2	26 32.5 33.3 11.7	80 36.0
COLUMN TOTAL	82 36.9	62 27.9	78 35.1	222 100.0

COUNT
ROW PCT
COL PCT
TOT CT

Raw chi square = 5.63075 $p < 0.2285$

THE EFFECT OF AGE BY STATEMENT #14: "ORV USE STRIPS VEGETATION FROM THE SOIL."

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #14 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		17 54.8 14.4 7.6	6 19.4 12.2 2.7	8 25.8 14.3 3.6	31 13.9
20 TO 29		57 50.9 48.3 25.6	28 25.0 57.1 12.6	27 24.1 48.2 12.1	112 50.2
30 AND OLDER		44 55.0 37.3 19.7	15 18.8 30.6 6.7	21 26.3 37.5 9.4	80 35.9
COLUMN TOTAL		118 52.9	49 22.0	56 25.1	223 100.0

Raw chi square = 1.20814 with 2 df p < 0.8768

THE EFFECT OF AGE BY STATEMENT #15: "ASSUMING THAT ORVS CAUSE SOIL EROSIONS, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

AGE	STATEMENT #15 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER	13 41.9 14.9 5.9	15 48.4 17.0 6.8	3 9.7 6.4 1.4	31 14.0
20 TO 29	38 34.2 43.7 17.1	50 45.0 56.8 22.5	23 20.7 48.9 10.4	23 50.0
30 AND OLDER	36 45.0 41.4 16.2	23 28.8 26.1 10.4	21 26.3 44.7 9.5	80 36.0
COLUMN TOTAL	87 39.2	88 39.6	47 21.2	222

Raw chi square = 8.17389 with 4 df $p < 0.0854$

THE EFFECT OF AGE BY STATEMENT #16: "ASSUMING THAT ORVS CAUSE LOSS OF VEGETATION, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #16 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		11 35.5 12.8 5.0	12 38.7 15.8 5.5	8 25.8 13.8 3.6	31 14.1
20 TO 29		43 38.7 50.0 19.5	40 36.0 52.6 18.2	28 25.2 48.3 12.7	111 50.5
30 AND OLDER		32 41.0 37.2 14.5	24 30.8 31.6 10.9	22 28.2 37.9 10.0	78 35.5
COLUMN TOTAL		86 39.1	76 34.5	58 26.4	220 100.0

Raw chi square = 0.88891 with 4 df $p < 0.9261$

THE EFFECT OF AGE BY STATEMENT #17: "ASSUMING THAT ORV USE CAUSES THE LOSS OF WILDLIFE IN AN AREA, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

AGE	STATEMENT #17 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER	8 25.8 13.3 3.6	12 38.7 14.0 5.4	11 35.5 14.3 4.9	31 13.9
20 TO 29	26 23.2 43.3 11.7	48 42.9 55.8 21.5	38 33.9 49.4 17.0	112 50.2
30 AND OLDER	26 32.5 43.3 11.7	26 32.5 30.2 11.7	28 35.0 36.4 12.6	80 35.9
COLUMN TOTAL	60 26.9	86 38.6	77 34.5	223 100.0

Raw chi square = 2.83496 with 4 df $p < 0.5858$

THE EFFECT OF AGE BY STATEMENT #18: "ORV USERS SHOULD PAY FOR MANAGEMENT OF SPECIFIC AREAS TO BE USED BY THEIR VEHICLES."

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #18 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		14 45.2 13.7 6.3	4 12.9 13.3 1.8	13 41.9 14.3 5.8	31 13.9
20 TO 29		52 46.4 51.0 23.3	17 15.2 56.7 7.6	43 38.4 47.3 19.3	112 50.2
30 AND OLDER		36 45.0 35.3 16.1	9 11.3 30.0 4.0	35 43.8 38.5 15.7	80 35.9
COLUMN TOTAL		102 45.7	30 13.5	91 40.8	223 100.0

Raw chi square = 0.90635 with 4 df $p < 0.9236$
1 cell with E. F. < 5

THE EFFECT OF AGE BY STATEMENT #19: "ANY IMPACTS OF ORV USE IN THIS AREA ARE ACCEPTABLE.

AGE	COUNT / ROW PCT / COL PCT / TOT CT	STATEMENT #19 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
NINETEEN OR YOUNGER		21 67.7 13.0 9.4	2 6.5 8.0 .9	8 25.8 22.2 3.6	31 13.9
20 TO 29		79 70.5 48.8 35.4	17 15.2 68.0 7.6	16 14.3 44.4 7.2	112 50.2
30 AND OLDER		62 77.5 38.3 27.8	6 7.5 24.0 2.7	12 15.0 33.3 5.4	80 35.9
COLUMN TOTAL		162 72.6	25 11.2	36 16.1	223 100.0

Raw chi square = 5.70976 with 4 df $p < 0.2219$
1 cell with E. F. < 5

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #1:
"ORV USE IN DESIGNATED AREAS HAS LITTLE EFFECT ON NON-ORV USERS."

EDUCATION LEVEL (COUNT / ROW PCT / COL PCT / TOT PCT)	STATEMENT #1 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	91 85.0 47.9 40.8	6 5.6 40.0 2.7	10 9.3 55.6 4.5	107 48.0
MORE THAN HIGH SCHOOL	99 85.3 52.1 44.4	9 7.8 60.0 4.0	8 6.9 44.4 3.6	116 52.0
COLUMN TOTAL	190 85.2	15 6.7	18 8.1	223 100.0

Raw chi square = 0.79713 with 2 df p < 0.6713

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #2:
"ORV USE CAUSES NO HARM TO THE ENVIRONMENT."

EDUCATION LEVEL (COUNT / ROW PCT / COL PCT / TOT PCT)	STATEMENT #2 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	62 58.5 48.1 28.1	19 17.9 46.3 8.6	25 23.6 49.0 11.3	106 48.0
MORE THAN HIGH SCHOOL	67 58.3 51.9 30.3	22 19.1 53.7 10.0	26 22.6 51.0 11.8	115 52.0
COLUMN TOTAL	129 58.4	41 18.6	51 23.1	221 100.0

Raw chi square = 0.06651 with 2 df p < 0.9673

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #3:
"ORV USE IN SAND DUNES HAS LITTLE EFFECT
ON THE SAND DUNES' VEGETATION.

EDUCATION LEVEL (COUNT / ROW PCT / COL PCT / TOT PCT)	STATEMENT #3 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	50 47.2 50.5 22.5	29 27.4 49.2 13.1	27 25.5 42.2 12.2	106 47.7
MORE THAN HIGH SCHOOL	49 42.2 49.5 22.1	30 25.9 50.8 13.5	37 31.9 57.8 16.7	116 52.3
COLUMN TOTAL	99 44.6	59 26.6	64 28.8	222 100.0

Raw chi square = 1.14141 with 2 df p < 0.5651

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #4:
"THE NOISE CAUSED BY ORVS DRIVE
WILDLIFE FROM THE AREA.

EDUCATION LEVEL (COUNT / ROW PCT / COL PCT / TOT PCT)	STATEMENT #4 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	36 33.6 47.4 16.1	11 10.3 34.4 4.9	60 56.1 52.2 26.9	107 48.0
MORE THAN HIGH SCHOOL	40 34.5 52.6 17.9	21 18.1 65.6 9.4	55 47.4 47.8 24.7	116 52.0
COLUMN TOTAL	76 34.1	32 14.3	115 51.6	223 100.0

Raw chi square = 3.19489 with 2 df p < 0.2024

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #5:
"ORV USE HAS NO EFFECT ON THE SOIL'S
ABILITY TO ABSORB WATER.

EDUCATION LEVEL	COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #5 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS		47 43.9 49.0 21.1	37 34.6 45.1 16.6	23 21.5 51.1 10.3	107 48.0
MORE THAN HIGH SCHOOL		49 42.2 51.0 22.0	45 38.8 54.9 20.2	22 19.0 48.9 9.9	116 52.0
COLUMN TOTAL		96 43.0	82 36.8	45 20.2	223 100.0

Raw chi square = 0.48193 with 2 df p < 0.7859

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #6:
"ORVS DESTROY VEGETATION BY RUNNING
OVER THE STEMS AND ROOTS."

EDUCATION LEVEL	COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #6 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS		46 43.0 46.0 20.7	21 19.6 46.7 9.5	40 37.4 51.9 18.0	107 48.2
MORE THAN HIGH SCHOOL		54 47.0 54.0 24.3	24 20.9 53.3 10.8	37 32.2 48.1 16.7	115 51.8
COLUMN TOTAL		100 45.0	45 20.3	77 34.7	222 100.0

Raw chi square = 0.66946 with 2 df p < 0.7155

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #7:
"ORVS CAN ONLY HARM ANIMALS BY
RUNNING OVER THE ANIMALS."

EDUCATION LEVEL (COUNT / ROW PCT / COL PCT / TOT PCT)	STATEMENT #7 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	54 50.5 46.6 24.2	23 21.5 51.1 10.3	30 28.0 48.4 13.5	107 48.0
MORE THAN HIGH SCHOOL	62 53.4 53.4 27.8	22 19.0 48.9 9.9	32 27.6 51.6 14.3	116 52.0
COLUMN TOTAL	116 52.0	45 20.2	62 27.8	223 100.0

Raw chi square = 0.27568 with 2 df p < 0.8712

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #8:
"ORVS DRIVEN ON SAND DUNES
CAN LEAD TO EROSION."

EDUCATION LEVEL (COUNT / ROW PCT / COL PCT / TOT PCT)	STATEMENT #8 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	30 28.0 40.5 13.5	30 28.0 51.7 13.5	47 43.9 51.6 21.1	107 48.0
MORE THAN HIGH SCHOOL	44 37.9 59.5 19.7	28 24.1 48.3 12.6	44 37.9 48.4 19.7	116 52.0
COLUMN TOTAL	74 33.2	58 26.0	91 40.8	223 100.0

Raw chi square = 2.45729 with 2 df p < 0.2927

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #9:
"ORV USE CAUSES SOIL EROSION ON FLAT LAND."

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #9 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	22 20.8 52.4 10.0	24 22.6 40.7 11.0	60 56.6 50.8 27.4	106 48.4
MORE THAN HIGH SCHOOL	20 17.7 47.6 9.1	35 31.0 59.3 16.0	58 51.3 49.2 26.5	113 51.6
COLUMN TOTAL	42 19.2	59 26.9	118 53.9	219 100.0

Raw chi square = 1.95824 with 2 df p < 0.3756

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #10:
"ORV USE ON A RIVER BED HAS LITTLE EFFECT
ON THE ENVIRONMENT OF THE RIVER."

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #10 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	62 57.9 48.1 27.8	24 22.4 49.0 10.8	21 19.6 46.7 9.4	107 48.0
MORE THAN HIGH SCHOOL	67 57.8 51.9 30.0	25 21.6 51.0 11.2	24 20.7 53.3 10.8	116 52.0
COLUMN TOTAL	129 57.8	49 22.0	45 20.2	223 100.0

Raw chi square = 0.05106 with 2 df p < 0.9748

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #11:
"ORVS CAN ONLY HARM BIRDS WHEN
THEY ARE NESTING."

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #11 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	23 21.5 41.8 10.3	42 39.3 49.4 18.8	42 39.3 50.6 18.8	107 48.0
MORE THAN HIGH SCHOOL	32 27.6 58.2 14.3	43 37.1 50.6 19.3	41 35.3 49.4 18.4	116 52.0
COLUMN TOTAL	55 24.7	85 38.1	83 37.2	223 100.0

Raw chi square = 1.13516 with 2 df p < 0.5669

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #12:
"TWO-WHEEL, THREE-WHEEL, AND FOUR-WHEEL
DRIVE ORVS ALL HAVE SIMILAR IMPACTS
ON THE ENVIRONMENT."

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #12 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	66 62.3 49.3 29.7	11 10.4 29.7 5.0	29 27.4 56.9 13.1	106 47.7
MORE THAN HIGH SCHOOL	68 58.6 50.7 30.6	26 22.4 70.3 11.7	22 19.0 43.1 9.9	116 52.3
COLUMN TOTAL	134 60.4	37 16.7	51 23.0	222 100.0

Raw chi square = 6.63472 with 2 df p < 0.0362

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #13:
"KNOBBY TIRES CAUSES MORE DAMAGE
THAN BALLOON TIRES."

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #13 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	38 35.8 46.3 17.1	32 30.2 51.6 14.4	36 34.0 46.2 16.2	106 47.7
MORE THAN HIGH SCHOOL	44 37.9 53.7 19.8	30 25.9 48.4 13.5	42 36.2 53.8 18.9	116 52.3
COLUMN TOTAL	82 36.9	62 27.9	78 35.1	222 100.0

Raw chi square = 0.51568 with 2 df p < 0.7727

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #14:
"ORV USE STRIPS VEGETATION FROM THE SOIL."

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #14 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	54 50.5 45.8 24.2	27 25.2 55.1 12.1	26 24.3 46.4 11.7	107 48.0
MORE THAN HIGH SCHOOL	64 55.2 54.2 28.7	22 19.0 44.9 9.9	30 25.9 53.6 13.5	116 52.0
COLUMN TOTAL	118 52.9	49 22.0	56 25.1	223 100.0

Raw chi square = 1.28224 with 2 df p < 0.5267

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #15:
"ASSUMING THAT ORVS CAUSE SOIL EROSIONS, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #15: AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	38 35.8 43.7 17.1	43 40.6 48.9 19.4	25 23.6 53.2 11.3	106 47.7
MORE THAN HIGH SCHOOL	49 42.2 56.3 22.1	45 38.8 51.1 20.3	22 19.0 46.8 9.9	116 52.3
COLUMN TOTAL	87 39.2	88 39.6	47 21.2	222 100.0

Raw chi square = 1.17969 with 2 df p < 0.5544

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #16:
"ASSUMING THAT ORVS CAUSE LOSS OF VEGETATION, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #16: AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	45 42.1 52.3 20.5	29 27.1 38.2 13.2	33 30.8 56.9 15.0	107 48.6
MORE THAN HIGH SCHOOL	41 36.3 47.7 18.6	47 41.6 61.8 21.4	25 22.1 43.1 11.4	113 51.4
COLUMN TOTAL	86 39.1	76 34.5	58 26.4	220 100.0

Raw chi square = 5.39303 with 2 df p < 0.0674

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #17:
"ASSUMING THAT ORV USE CAUSES THE LOSS OF
WILDLIFE IN AN AREA, THIS IS AN
ACCEPTABLE CONSEQUENCE
OF ORV USE."

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #17 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	32 29.9 53.3 14.3	32 29.9 37.2 14.3	43 40.2 55.8 19.3	107 48.0
MORE THAN HIGH SCHOOL	28 24.1 46.7 12.6	54 46.6 62.8 24.2	34 29.3 44.2 15.2	116 52.0
COLUMN TOTAL	60 26.9	86 38.6	77 34.5	223 100.0

Raw chi square = 6.59404 with 2 df $p < 0.0370$

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #18: "ORV USERS SHOULD PAY FOR MANAGEMENT OF SPECIFIC AREAS TO BE USED BY THEIR VEHICLES."

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #18 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	45 42.1 44.1 20.2	14 13.1 46.7 6.3	48 44.9 52.7 21.5	107 48.0
MORE THAN HIGH SCHOOL	57 49.1 55.9 25.6	16 13.8 53.5 7.2	43 37.1 47.3 19.3	116 52.0
COLUMN TOTAL	102 45.7	30 13.5	91 40.8	223 100.0

Raw chi square = 1.45897 with 2 df p < 0.4822

THE EFFECT OF EDUCATION LEVEL BY STATEMENT #19: "ANY IMPACTS OF ORV USE IN THIS AREA ARE ACCEPTABLE.

EDUCATION LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #19 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
HIGH SCHOOL OR LESS	77 72.0 47.5 34.5	8 7.5 32.0 3.6	22 20.6 61.1 9.9	107 48.0
MORE THAN HIGH SCHOOL	85 73.3 52.5 38.1	17 14.7 68.0 7.6	14 12.1 38.9 6.3	116 52.0
COLUMN TOTAL	162 72.6	25 11.2	36 16.1	223 100.0

Raw chi square = 5.05785 with 2 df p < 0.0797

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #1:
"ORV USE IN DESIGNATED AREAS HAS LITTLE EFFECT ON NON-ORV USERS."

YEARS OPERATING ORVS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #1 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	107 83.6 56.3 48.0	8 6.3 53.3 3.6	13 10.2 72.2 5.8	128 57.4
SIX YEARS OR MORE	83 87.4 43.7 37.2	7 7.4 46.7 3.1	5 5.3 27.8 2.2	95 42.6
COLUMN TOTAL	190 85.2	15 6.7	18 8.1	223 100.0

Raw chi square = 1.81003 with 2 df p < 0.4045

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #2:
"ORV USE CAUSES NO HARM TO THE ENVIRONMENT."

YEARS OPERATING ORVS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #2 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	78 61.9 60.5 35.3	20 15.9 48.8 9.0	28 22.2 54.9 12.7	126 57.0
SIX YEARS OR MORE	51 53.7 39.5 23.1	21 22.1 51.2 9.5	23 24.2 45.1 10.4	95 43.0
COLUMN TOTAL	129 58.4	41 18.6	51 23.1	221 100.0

Raw chi square = 1.85382 with 2 df p < 0.3958

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #3:
"ORV USE IN SAND DUNES HAS LITTLE EFFECT
ON THE SAND DUNES' VEGETATION.

YEARS OPERATING ORVS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #3 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	57 44.9 57.6 25.7	31 24.4 52.5 14.0	39 30.7 60.9 17.6	127 57.2
SIX YEARS OR MORE	42 44.2 42.4 18.9	28 29.5 47.5 12.6	25 26.3 39.1 11.3	95 42.8
COLUMN TOTAL	99 44.6	59 26.6	64 28.8	222 100.0

Raw chi square = 0.89372 with 2 df p < 0.6396

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #4:
"THE NOISE CAUSED BY ORVS DRIVE
WILDLIFE FROM THE AREA.

YEARS OPERATING ORVS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #4 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	42 32.8 55.3 18.8	18 14.1 56.3 8.1	68 53.1 59.1 30.5	128 57.4
SIX YEARS OR MORE	34 35.8 44.7 15.2	14 14.7 43.8 6.3	47 49.5 40.9 21.1	95 42.6
COLUMN TOTAL	76 34.1	32 14.3	115 51.6	223 100.0

Raw chi square = 0.30005 with 2 df p < 0.8607

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #5:
"ORV USE HAS NO EFFECT ON THE SOIL'S
ABILITY TO ABSORB WATER.

YEARS OPERATING ORVS	STATEMENT #5 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	57 44.5 59.4 25.6	41 32.0 50.0 18.4	30 23.4 66.7 13.5	128 57.4
SIX YEARS OR MORE	39 41.1 40.6 17.5	41 43.2 50.0 18.4	15 15.8 33.3 6.7	95 42.6
COLUMN TOTAL	96 43.0	82 36.8	45 20.2	223 100.0

Raw chi square = 3.56977 with 2 df p < 0.1678

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #6:
"ORVS DESTROY VEGETATION BY RUNNING
OVER THE STEMS AND ROOTS."

YEARS OPERATING ORVS	STATEMENT #6 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	54 42.2 54.0 24.3	27 21.1 60.0 12.2	47 36.7 61.0 21.2	128 57.7
SIX YEARS OR MORE	46 48.9 46.0 20.7	18 19.1 40.0 8.1	30 31.9 39.0 13.5	94 42.3
COLUMN TOTAL	100 45.0	45 20.3	77 34.7	222 100.0

Raw chi square = 1.00972 with 2 df p < 0.6036

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #7:
"ORVS CAN ONLY HARM ANIMALS BY
RUNNING OVER THE ANIMALS."

YEARS OPERATING ORVS	COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #7 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS		70 54.7 60.3 31.4	25 19.5 55.6 11.2	33 25.8 53.2 14.8	128 57.4
SIX YEARS OR MORE		46 48.4 39.7 20.6	20 21.1 44.4 9.0	29 30.5 46.8 13.0	95 42.6
COLUMN TOTAL		116 52.0	45 20.2	62 27.8	223 100.0

Raw chi square = 0.91578 with 2 df p < 0.6326

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #8:
"ORVS DRIVEN ON SAND DUNES CAN LEAD TO EROSION."

YEARS OPERATING ORVS	COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #8 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS		44 34.4 59.5 19.7	34 26.6 58.6 15.2	50 39.1 54.9 22.4	128 57.4
SIX YEARS OR MORE		30 31.6 40.5 13.5	24 25.3 41.4 10.8	41 43.2 45.1 18.4	95 42.6
COLUMN TOTAL		74 33.2	58 26.0	91 40.8	223 100.0

Raw chi square = 0.38798 with 2 df p < 0.8237

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #9:
"ORV USE CAUSES SOIL EROSION ON FLAT LAND."

YEARS OPERATING ORVS	COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #9 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS		24 19.2 57.1 11.0	32 25.6 54.2 14.6	69 55.2 58.5 31.5	125 57.1
SIX YEARS OR MORE		18 19.1 42.9 8.2	27 28.7 45.8 12.3	49 52.1 41.1 22.4	94 42.9
COLUMN TOTAL		42 19.2	59 26.9	118 53.9	219 100.0

Raw chi square = 0.28835 with 2 df p < 0.8657

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #10:
"ORV USE ON A RIVER BED HAS LITTLE EFFECT
ON THE ENVIRONMENT OF THE RIVER."

YEARS OPERATING ORVS	COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #10 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS		77 60.2 59.7 34.5	28 21.9 57.1 12.6	23 18.0 51.1 10.3	128 57.4
SIX YEARS OR MORE		52 54.7 40.3 23.3	21 22.1 42.9 9.4	22 23.2 48.9 9.9	95 42.6
COLUMN TOTAL		129 57.8	49 22.0	45 20.2	223 100.0

Raw chi square = 1.00580 with 2 df p < 0.6048

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #11:
"ORVS CAN ONLY HARM BIRDS WHEN THEY ARE NESTING."

YEARS OPERATING ORVS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #11 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	37 28.9 67.6 16.6	48 37.5 56.5 21.5	43 33.6 51.8 19.3	128 57.4
SIX YEARS OR MORE	18 18.9 32.7 8.1	37 38.9 43.5 16.6	40 42.1 48.2 17.9	95 42.6
COLUMN TOTAL	55 24.7	85 38.1	83 37.2	223 100.0

Raw chi square = 3.28411 with 2 df p < 0.1936

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #12:
"TWO-WHEEL, THREE-WHEEL, AND FOUR-WHEEL DRIVE ORVS
ALL HAVE SIMILAR IMPACTS ON THE ENVIRONMENT."

YEARS OPERATING ORVS / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #12 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	85 66.4 63.4 38.3	17 13.3 45.9 7.7	26 20.3 51.0 11.7	128 57.7
SIX YEARS OR MORE	49 52.1 36.6 22.1	20 21.3 54.1 9.0	25 26.6 49.0 11.3	94 42.3
COLUMN TOTAL	134 60.4	37 16.7	51 23.0	222 100.0

Raw chi square = 4.84082 with 2 df p < 0.0889

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #13:
"KNOBBY TIRES CAUSES MORE DAMAGE
THAN BALLOON TIRES."

YEARS OPERATING ORVS — COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #13 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	45 35.4 54.9 20.3	36 28.3 58.1 16.2	46 36.2 59.0 20.7	127 57.2
SIX YEARS OR MORE	37 38.9 45.1 16.7	26 27.4 41.9 11.7	32 33.7 41.0 14.4	95 42.8
COLUMN TOTAL	82 36.9	62 27.9	78 35.1	222 100.0

Raw chi square = 0.29983 with 2 df p < 0.8608

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #14:
"ORV USE STRIPS VEGETATION FROM THE SOIL."

YEARS OPERATING ORVS — COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #14 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	67 52.3 56.8 30.0	29 22.7 59.2 13.0	32 25.0 57.1 14.3	128 57.4
SIX YEARS OR MORE	51 53.7 43.2 22.9	20 21.1 40.8 9.0	24 25.3 42.9 10.8	95 42.6
COLUMN TOTAL	118 52.9	49 22.0	56 25.1	223 100.0

Raw chi square = 0.08384 with 2 df p < 0.9589

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #15:
"ASSUMING THAT ORVS CAUSE SOIL EROSIONS, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

YEARS OPERATING ORVS — COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #15 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	49 38.6 56.3 22.1	50 39.4 56.8 22.5	28 22.0 59.6 12.6	127 57.2
SIX YEARS OR MORE	38 40.0 43.7 17.1	38 40.0 43.2 17.1	19 20.0 40.4 8.6	95 42.8
COLUMN TOTAL	87 39.2	88 39.6	47 21.2	222 100.0

Raw chi square = 0.14089 with 2 df p < 0.9320

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #16:
"ASSUMING THAT ORVS CAUSE LOSS OF VEGETATION, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

YEARS OPERATING ORVS — COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #16 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	51 40.2 59.3 23.2	41 32.3 53.9 18.6	35 27.6 60.3 15.9	127 57.7
SIX YEARS OR MORE	35 37.6 40.7 15.9	35 37.6 46.1 15.9	23 24.7 39.7 10.5	93 42.3
COLUMN TOTAL	86 39.1	76 34.5	58 26.4	220 100.0

Raw chi square = 0.68525 with 2 df p < 0.7064

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #17:
"ASSUMING THAT ORV USE CAUSES THE LOSS OF WILDLIFE IN AN AREA, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

YEARS OPERATING ORVS — COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #17 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	31 24.2 51.7 13.9	53 41.4 61.6 23.8	44 34.4 57.1 19.7	128 57.4
SIX YEARS OR MORE	29 30.5 48.3 13.0	33 34.7 38.4 14.8	33 34.7 42.9 14.8	95 42.6
COLUMN TOTAL	60 26.9	86 38.6	77 34.5	223 100.0

Raw chi square = 1.43733 with 2 df p < 0.4874

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #18:
"ORV USERS SHOULD PAY FOR MANAGEMENT OF SPECIFIC AREAS TO BE USED BY THEIR VEHICLES."

YEARS OPERATING ORVS — COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #18 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS	64 50.0 62.7 28.7	14 10.9 46.7 6.3	50 39.1 54.9 22.4	128 57.4
SIX YEARS OR MORE	38 40.0 37.3 17.0	16 16.8 53.3 7.2	41 43.2 45.1 18.4	95 42.6
COLUMN TOTAL	102 45.7	30 13.5	91 40.8	223 100.0

Raw chi square = 2.82945 with 2 df p < 0.2430

THE EFFECT OF YEARS OPERATING ORVS BY STATEMENT #19:
"ANY IMPACTS OF ORV USE IN THIS
AREA ARE ACCEPTABLE.

YEARS OPERATING ORVS	COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #19 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
FIVE YEARS OR LESS		91 71.1 56.2 40.8	13 10.2 52.0 5.8	24 18.8 66.7 10.8	128 57.4
SIX YEARS OR MORE		71 74.7 43.8 31.8	12 12.6 48.0 5.4	12 12.6 33.3 5.4	95 42.6
COLUMN TOTAL		162 72.6	25 11.2	36 16.1	223 100.0

Raw chi square = 1.66213 with 2 df $p < 0.4356$

THE EFFECT OF INCOME LEVEL BY STATEMENT #1: "ORV USE IN DESIGNATED AREAS HAS LITTLE EFFECT ON NON-ORV USERS."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #1 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	81 83.5 44.3 37.5	6 6.2 40.0 2.8	10 10.3 55.6 4.6	97 44.9
OVER $25,001	102 85.7 55.7 47.2	9 7.6 60.1 4.2	8 6.7 44.4 3.7	119 55.1
COLUMN TOTAL	183 84.7	15 6.9	18 8.3	216 100.0

Raw chi square = 1.001741 with 2 df p < 0.6060

THE EFFECT OF INCOME LEVEL BY STATEMENT #2: "ORV USE CAUSES NO HARM TO THE ENVIRONMENT."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #2 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	54 55.7 43.9 25.2	18 18.6 43.9 8.4	25 25.8 50.0 11.7	97 45.3
OVER $25,001	69 59.0 56.1 32.2	23 19.7 56.1 10.7	25 21.4 50.0 11.7	117 54.7
COLUMN TOTAL	123 57.5	41 19.2	50 23.4	214 100.0

Raw chi square = 0.57489 with 2 df p < 0.7502

THE EFFECT OF INCOME LEVEL BY STATEMENT #3:
"ORV USE IN SAND DUNES HAS LITTLE EFFECT
ON THE SAND DUNES' VEGETATION.

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #3 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	43 44.8 44.3 20.0	26 27.1 48.1 12.1	27 28.1 42.2 12.6	96 44.7
OVER $25,001	54 45.4 55.7 25.1	28 23.5 51.9 13.0	37 31.1 57.8 17.2	119 55.3
COLUMN TOTAL	97 45.1	54 25.1	64 29.8	215 100.0

Raw chi square = 0.42844 with 2 df p < 0.8072

THE EFFECT OF INCOME LEVEL BY STATEMENT #4:
"THE NOISE CAUSED BY ORVS DRIVE
WILDLIFE FROM THE AREA.

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #4 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	29 29.2 39.2 13.4	10 10.3 33.3 4.6	58 59.8 51.8 26.9	97 44.9
OVER $25,001	45 37.8 61.8 20.8	20 16.8 66.7 9.3	54 45.4 48.2 25.0	119 55.1
COLUMN TOTAL	74 34.3	30 13.9	112 51.9	216 100.0

Raw chi square = 4.74412 with 2 df p < 0.0933

THE EFFECT OF INCOME LEVEL BY STATEMENT #5:
"ORV USE HAS NO EFFECT ON THE SOIL'S
ABILITY TO ABSORB WATER.

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #5 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	43 44.3 46.2 19.9	33 34.0 41.8 15.3	21 21.6 47.7 9.7	97 44.9
OVER $25,001	50 42.0 53.8 23.1	46 38.7 58.2 21.3	23 19.3 52.3 10.6	119 55.1
COLUMN TOTAL	93 43.1	79 36.6	44 20.4	216 100.0

Raw chi square = 0.52170 with 2 df p < 0.7704

THE EFFECT OF INCOME LEVEL BY STATEMENT #6:
"ORVS DESTROY VEGETATION BY RUNNING
OVER THE STEMS AND ROOTS."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #6 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	32 33.3 33.3 14.9	28 29.2 63.6 13.0	36 37.5 48.0 16.7	96 44.7
OVER $25,001	64 53.8 66.7 29.8	16 13.4 36.4 7.4	39 32.8 52.0 18.1	119 55.3
COLUMN TOTAL	96 44.7	44 20.5	75 34.9	215 100.0

Raw chi square = 11.73322 with 2 df p < 0.0028

THE EFFECT OF INCOME LEVEL BY STATEMENT #7:
"ORVS CAN ONLY HARM ANIMALS BY
RUNNING OVER THE ANIMALS."

INCOME LEVEL / COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #7 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	40 41.2 35.7 18.5	23 23.7 52.3 10.6	34 35.1 56.7 15.7	97 44.9
OVER $25,001	72 60.5 64.3 33.3	21 17.6 47.7 9.7	26 21.8 43.3 12.3	119 55.1
COLUMN TOTAL	112 51.9	44 20.4	60 27.8	216 100.0

Raw chi square = 8.14418 with 2 df p < 0.0170

THE EFFECT OF INCOME LEVEL BY STATEMENT #8: "ORVS
DRIVEN ON SAND DUNES CAN LEAD TO EROSION."

INCOME LEVEL / COUNT / ROW PCT / COL PCT / TOT PCT	STATEMENT #8 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	29 29.9 39.2 13.4	26 26.8 48.1 12.0	42 43.3 47.7 19.4	97 44.9
OVER $25,001	45 37.8 60.8 20.8	28 23.5 51.9 13.0	46 38.7 52.3 21.3	119 55.1
COLUMN TOTAL	74 34.3	54 25.0	88 40.7	216 100.0

Raw chi square = 1.49007 with 2 df p < 0.4747

THE EFFECT OF INCOME LEVEL BY STATEMENT #9:
"ORV USE CAUSES SOIL EROSION ON FLAT LAND."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #9: AGREE	NO OPIN, NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	23 23.7 54.8 10.8	21 21.6 37.5 9.9	53 54.6 46.6 25.0	97 45.8
OVER $25,001	19 16.5 45.2 9.0	35 30.4 62.5 16.5	61 53.0 53.5 28.8	115 54.2
COLUMN TOTAL	42 19.8	56 26.4	114 53.8	212 100.0

Raw chi square = 2.93521 with 2 df p < 0.2305

THE EFFECT OF INCOME LEVEL BY STATEMENT #10:
"ORV USE ON A RIVER BED HAS LITTLE EFFECT
ON THE ENVIRONMENT OF THE RIVER."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #10: AGREE	NO OPIN, NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	48 49.5 38.7 22.2	26 26.8 54.2 12.0	23 23.7 52.3 10.6	97 44.9
OVER $25,001	76 63.9 61.3 35.2	22 18.5 45.8 10.2	21 17.6 47.7 9.7	119 55.1
COLUMN TOTAL	124 57.4	48 22.2	44 20.4	216 100.0

Raw chi square = 4.55333 with 2 df p < 0.1026

THE EFFECT OF INCOME LEVEL BY STATEMENT #11: "ORVS CAN ONLY HARM BIRDS WHEN THEY ARE NESTING."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #11 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	22 22.7 40.0 10.2	40 41.2 49.4 18.5	35 36.1 43.8 16.2	97 44.9
OVER $25,001	33 27.7 60.0 15.3	41 34.5 50.6 19.0	45 37.8 56.3 20.8	119 55.1
COLUMN TOTAL	55 25.5	81 37.5	80 37.0	216 100.0

Raw chi square = 1.23441 with 2 df p < 0.5395

THE EFFECT OF INCOME LEVEL BY STATEMENT #12: "TWO-WHEEL, THREE-WHEEL, AND FOUR-WHEEL DRIVE ORVS ALL HAVE SIMILAR IMPACTS ON THE ENVIRONMENT."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #12 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	61 63.5 47.3 28.4	13 13.5 36.1 6.0	22 22.9 44.0 10.2	96 44.7
OVER $25,001	68 57.1 52.7 31.6	23 19.3 63.9 10.7	28 23.5 56.0 13.0	119 55.3
COLUMN TOTAL	129 60.0	36 16.7	50 23.3	215 100.0

Raw chi square = 1.43357 with 2 df p < 0.4883

THE EFFECT OF INCOME LEVEL BY STATEMENT #13: "KNOBBY TIRES CAUSES MORE DAMAGE THAN BALLOON TIRES."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #13 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	30 31.3 38.0 14.0	30 31.3 48.4 14.0	36 37.5 48.6 16.7	96 44.7
OVER $25,001	49 41.2 62.0 22.8	32 26.9 51.6 14.9	38 31.9 51.4 17.7	119 55.3
COLUMN TOTAL	79 36.7	62 28.8	74 34.4	215 100.0

Raw chi square = 2.25351 with 2 df p < 0.3241

THE EFFECT OF INCOME LEVEL BY STATEMENT #14: "ORV USE STRIPS VEGETATION FROM THE SOIL."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #14 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	48 49.5 42.5 22.2	26 26.8 53.1 12.0	23 23.7 42.6 10.6	97 44.9
OVER $25,001	65 54.6 57.5 30.1	23 19.3 46.9 10.6	31 26.1 57.4 14.4	119 55.1
COLUMN TOTAL	113 52.3	49 22.7	54 25.0	216 100.0

Raw chi square = 1.70331 with 2 df p < 0.4267

THE EFFECT OF INCOME LEVEL BY STATEMENT #15:
"ASSUMING THAT ORVS CAUSE SOIL EROSIONS,
THIS IS AN ACCEPTABLE CONSEQUENCE
OF ORV USE."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #15: AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	41 42.7 48.8 19.1	38 39.6 44.7 17.7	17 17.7 37.0 7.9	96 44.7
OVER $25,001	43 36.1 51.2 20.0	47 39.5 55.3 21.9	29 24.4 63.0 13.5	119 55.3
COLUMN TOTAL	84 39.1	85 39.5	46 21.4	215 100.0

Raw chi square = 1.68986 with 2 df p < 0.4296

THE EFFECT OF INCOME LEVEL BY STATEMENT #16: "ASSUMING
THAT ORVS CAUSE LOSS OF VEGETATION, THIS IS AN
ACCEPTABLE CONSEQUENCE OF ORV USE."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #16: AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	43 44.8 51.2 20.2	32 33.3 43.8 15.0	21 21.9 37.5 9.9	96 45.1
OVER $25,001	41 35.0 48.8 19.2	41 35.0 56.2 19.2	35 29.9 62.5 16.4	117 54.9
COLUMN TOTAL	84 39.4	73 34.3	56 26.3	213 100.0

Raw chi square = 2.61217 with 2 df p < 0.2709

THE EFFECT OF INCOME LEVEL BY STATEMENT #17: "ASSUMING THAT ORV USE CAUSES THE LOSS OF WILDLIFE IN AN AREA, THIS IS AN ACCEPTABLE CONSEQUENCE OF ORV USE."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #17: AGREE	NO OPIN, NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	25 25.8 42.4 11.6	40 41.2 47.6 18.5	32 33.0 43.8 14.8	97 44.9
OVER $25,001	34 28.6 57.6 15.7	44 37.0 52.4 20.4	41 34.5 56.2 19.0	119 55.1
COLUMN TOTAL	59 27.3	84 38.9	73 33.8	216 100.0

Raw chi square = 0.43674 with 2 df p < 0.8038

THE EFFECT OF INCOME LEVEL BY STATEMENT #18: "ORV USERS SHOULD PAY FOR MANAGEMENT OF SPECIFIC AREAS TO BE USED BY THEIR VEHICLES."

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #18: AGREE	NO OPIN, NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	45 46.4 45.0 20.8	12 12.4 41.4 5.6	40 41.2 46.0 18.5	97 44.9
OVER $25,001	55 46.2 55.0 25.5	17 14.3 58.6 7.9	47 39.5 54.0 21.8	119 55.1
COLUMN TOTAL	100 46.3	29 13.4	87 40.3	216 100.0

Raw chi square = 0.18648 with 2 df p < 0.9110

THE EFFECT OF INCOME LEVEL BY STATEMENT #19: "ANY IMPACTS OF ORV USE IN THIS AREA ARE ACCEPTABLE.

INCOME LEVEL / COUNT, ROW PCT, COL PCT, TOT PCT	STATEMENT #19 AGREE	NO OPIN NOT KNOW	DISAGREE	ROW TOTAL
UNDER $25,000	68 70.1 43.3 31.5	10 10.3 41.7 4.6	19 19.6 54.3 8.8	96 44.9
OVER $25,001	89 74.8 56.7 41.2	14 11.8 58.3 6.5	16 13.4 45.7 7.4	119 55.1
COLUMN TOTAL	157 72.7	24 11.1	35 16.2	216 100.0

Raw chi square = 1.50762 with 2 df p < 0.4706

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VITA

Mark Allan Reynolds

Candidate for the Degree of

Doctor of Education

Thesis: OFF-ROAD VEHICLE USER KNOWLEDGE OF ENVIRONMENTAL IMPACT IN SELECTED USE AREAS

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Biographical:

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