



**AgEcon** SEARCH  
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

*The World's Largest Open Access Agricultural & Applied Economics Digital Library*

**This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.**

**Help ensure our sustainability.**

Give to AgEcon Search

AgEcon Search  
<http://ageconsearch.umn.edu>  
[aesearch@umn.edu](mailto:aesearch@umn.edu)

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*



# Characteristics, Needs, and Attitudes of Snowmobilers in North Dakota in the Eighties

Jay A. Leitch, Bruce R. West and Randall S. Anderson



Department of Agricultural Economics  
Agricultural Experiment Station  
North Dakota State University  
Fargo, North Dakota 58105

## PREFACE

Our appreciation is extended to the 1,200 plus registered snowmobile owners in North Dakota who took time to complete our questionnaire. It is our hope that the results of this study will contribute to the efficient use of Trail Tax funds.

Mr. Tim Mueller, Deputy Director, and Ms. Dorothy Adams, Snowmobile Trails Coordinator, North Dakota Parks and Recreation Department, provided needed assistance and information vital to the study.

Julie Miller, Sharon Vreugdenhil, and Harvey Vreugdenhil were responsible for questionnaire coordination, data entry, and data recovery.

Finally, our thanks are extended to Ms. Lori Cullen, who typed questionnaires and this manuscript and to Ms. Brenda Ekstrom for her editorial comments.

Any errors or omissions that remain are our responsibility.

This study was supported by a grant from the North Dakota Parks and Recreation Department in cooperation with the North Dakota Agricultural Experiment Station.

## CONTENTS

	<u>Page</u>
Highlights . . . . .	iv
Introduction . . . . .	1
Literature Review . . . . .	1
Method . . . . .	2
Results . . . . .	4
Owner Characteristics . . . . .	4
Snowmobile Characteristics . . . . .	7
Participation in Snowmobiling . . . . .	9
Characteristics of Three-Wheeler Owners . . . . .	16
Attitudes and Preferences . . . . .	19
Summary and Conclusions . . . . .	24
Appendix A: Registered Snowmobile Owners Survey Instrument . . . . .	27
Appendix B: Data Tables . . . . .	35
Literature Cited . . . . .	39

TABLES

No.		Page
1.	AGE GROUPS OF SNOWMOBILE OWNERS AND OPERATORS IN NORTH DAKOTA, 1973 AND 1983 . . . . .	4
2.	EDUCATION LEVELS OF REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA IN 1973 AND 1983 . . . . .	6
3.	SNOWMOBILE CLUB MEMBERSHIP OF REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA, 1973 AND 1983 . . . . .	6
4.	BRAND NAMES OF REGISTERED SNOWMOBILES IN NORTH DAKOTA, 1973 AND 1983 . . . . .	7
5.	REASONS WHY REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA OWN SNOWMOBILES, 1983 AND 1973 . . . . .	11
6.	WHERE SNOWMOBILING IS DONE BY REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA, 1983 . . . . .	11
7.	ONE-WAY DISTANCES REGISTERED SNOWMOBILE OWNERS TRANSPORTED THEIR SNOWMOBILES TO SNOWMOBILE AREAS, 1973 AND 1983 . . . . .	12
8.	TOTAL DISTANCES REGISTERED SNOWMOBILES WERE DRIVEN, 1981-82 AND 1982-83 . . . . .	13
9.	REASONS WHY REGISTERED SNOWMOBILE OWNERS LEFT NORTH DAKOTA FOR SNOWMOBILING PURPOSES . . . . .	14
10.	MAXIMUM DISTANCE REGISTERED SNOWMOBILE OWNERS WOULD TRANSPORT SNOWMOBILES FOR A ONE-DAY OUTING, 1983 . . . . .	15
11.	HOURS SPENT SNOWMOBILING BY RSO DURING A TYPICAL WEEK, 1983 . . . . .	15
12.	USE OF STATE SNOWMOBILE TRAILS BY REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA, 1983 . . . . .	16
13.	REASONS WHY 82 PERCENT OF REGISTERED SNOWMOBILE OWNERS HAD NOT USED THE SEVEN STATE SNOWMOBILE TRAILS, 1983 . . . . .	16
14.	TYPICAL EXPENDITURES OF NORTH DAKOTA REGISTERED SNOWMOBILE OWNERS WHILE SNOWMOBILING, 1983 . . . . .	18
15.	BRAND NAMES OF THREE-WHEELERS OWNED BY REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA, 1983 . . . . .	19
16.	AREA (TOPOGRAPHY) PREFERRED BY NORTH DAKOTA RSOs FOR SNOWMOBILING, 1983 AND 1973 . . . . .	20

TABLES

<u>No.</u>		<u>Page</u>
17.	PREFERRED LENGTH OF SNOWMOBILE TRAIL BY NORTH DAKOTA REGISTERED SNOWMOBILE OWNERS, 1983 AND 1973 . . . . .	21
18.	SECONDARY SNOWMOBILE FACILITIES PREFERRED BY NORTH DAKOTA RSOs, 1983	21
19.	HAZARDS CONSIDERED MOST IMPORTANT BY NORTH DAKOTA RSOs, 1983 AND 1973 . . . . .	22
20.	REASONS FOR OR AGAINST LICENSING THREE-WHEELERS . . . . .	23
21.	REASONS FOR NOT CONTINUING TO SNOWMOBILE . . . . .	23
22.	HOW NORTH DAKOTA REGISTERED SNOWMOBILE OWNERS FELT THE SNOWMOBILE TAX FUND MONIES SHOULD BE USED . . . . .	24

FIGURES

<u>No.</u>		<u>Page</u>
1.	Home County of Registered Snowmobile Owners in 1983 . . . . .	5
2.	Model Year of Snowmobiles Registered and Three-Wheelers Owned by Registered Snowmobile Owners in North Dakota . . . . .	8
3.	Number of Years Respondents Owned a Snowmobile . . . . .	10
4.	Out-of-State Trips Taken by Snowmobilers, 1973 and 1983 . . . . .	14
5.	State Snowmobile Trails Within 66 Miles of North Dakota Locations .	17

### Highlights

*A mail survey of registered snowmobile owners in North Dakota in 1983 revealed that characteristics of snowmobilers and their snowmobiles have changed very little when compared to a similar survey 10 years earlier. The return of 1,228 questionnaires after three mailings and a telephone followup resulted in a 63 percent response rate. Only 17.5 percent of registered snowmobile owners used state trails in 1983. Reasons for not using state trails included too far to travel and simply not knowing they existed. Three-fourths of registered snowmobile owners in North Dakota feel that enforcement of snowmobile regulations is adequate, yet one-half feel three-wheeled recreational vehicles cause problems and should be licensed. Survey respondents felt that Trail Tax monies should be used for marking trails, grooming trails, youth safety, and leasing trails. Only 13 percent of the respondents indicated they did not plan to continue snowmobiling. However, given the increasing age of snowmobilers, the aging stock of snowmobiles, and the increasing trend toward three-wheeled recreational vehicles, long-term and capital improvements in snowmobile facilities should be looked at carefully.*

# CHARACTERISTICS, NEEDS, AND ATTITUDES OF SNOWMOBILERS IN NORTH DAKOTA IN THE EIGHTIES

Jay A. Leitch, Bruce R. West, and Randall S. Anderson\*

## Introduction

Although the zenith of snowmobile popularity occurred in the mid 1970s, snowmobiling is still a major form of winter recreation for thousands of North Dakotans. In 1983 the total number of snowmobiles registered in North Dakota was 13,924, a decrease of 29 percent from the 19,513 (Adams) recorded in the peak year of 1975. The advent of three-wheeled all-terrain vehicles, recent light snow cover, inflation, recession, and low farm prices has caused many North Dakotans to reconsider their recreation options. The ownership and operation of recreational snowmobiles has changed because of these conditions.

Sales of new snowmobiles in North Dakota have also shown a decrease, from peak sales of 8,123 and 8,172 in 1970 and 1974, respectively, to a 14-year low of 1,383 in 1981 (Adams). This represents an 83 percent decline in annual snowmobile sales over a seven-year period.

Approximately 40 to 50 percent of the snowmobiles in North Dakota were registered in 1974 (Thompson, 1974) with the percentage registered thought to be similar in 1983 (Adams, 1983). Since the Snowmobile Trail Tax Fund is financed by snowmobile registration fees, a substantial amount of potential revenue for the development, operation, and maintenance of snowmobile trails is not being collected. Also, the people who do register their snowmobiles may be paying a disproportionate share for the development and maintenance of public snowmobile trails and facilities. This minority, however, may be the active snowmobiler.

The objectives of this study were to 1) assess registered snowmobilers' awareness of and attitudes toward the management of the Snowmobile Trail Tax Fund; 2) estimate the past and project future recreational use of snowmobiles in North Dakota; 3) identify the socioeconomic characteristics of registered snowmobile owners; and 4) collect and interpret the self-assessed attitudes of registered snowmobilers concerning the enforcement of machine registration. This information will assist in the efficient allocation of snowmobile trail tax monies, provide a replication of a study 10 years earlier, and aid in the overall management of winter outdoor recreation.

## Literature Review

Snowmobile research can be traced to the early 1970s. One of the first studies was conducted by the Minnesota Bureau of Planning (1970) and projected a growing demand for snowmobile trails and facilities in Minnesota.

---

\*Assistant professor and research assistants, respectively.



A mail questionnaire was used by Thompson (1974) to investigate the use and attitudes of snowmobile owners in North Dakota in 1973. Results from the Thompson study will be used for comparison with results from this current North Dakota survey. Thompson reported that 96 percent of the snowmobile owners responding felt a percentage of the registration fees should be returned to the sport in the form of trails and facilities. The study further revealed that most North Dakota owners (68 percent) believed that snowmobiles either were beneficial or had no effect on wildlife.

McAloon (1975) used a snowmobile survey questionnaire mailed to 54 snowmobile clubs belonging to the Western Snowmobile Association in Montana to discern what problems snowmobilers themselves felt were most important. The five problem areas investigated were noise, damage to land, harassment of wildlife, littering, and accidents. Most of these problems have already been addressed by machine changes and legislation. McAloon reported that noise was considered a health hazard and control should be undertaken by the snowmobile manufacturers; that environmental damage to soil and vegetation could best be controlled by the use of snowmobile registration funds for trail construction and maintenance; that stricter enforcement of snowmobile operation regulations should be followed by arrests and convictions for animal harassment violators; that "No Littering" signs should be erected along snowmobile trails to prevent undue trash accumulation; and that accidents could be prevented by treating intoxicated snowmobilers the same as intoxicated automobile drivers. The majority of respondents also felt snowmobiles should be allowed to be operated on city streets.

In a major snowmobile study from Alberta, Canada, Smith (1976) reported that snowmobile owners had socioeconomic characteristics different from the general population. The average age of snowmobile owners was eight years greater than that of the general population, and a much larger proportion were male. Also a large proportion of snowmobile owners were employed in farming and horticulture, had completed more formal education, and had considerably larger incomes than those in the general population.

Another survey done in Canada (Reain, 1973) formulated a set of criteria to be used in planning snowmobile facilities in Ontario. Reain reported that snowmobiling is a family activity and that snowmobile users have a strong preference for well-groomed and marked wooded trails. He further suggested that in the future, snowmobile areas may be utilized for year-round recreation such as camping and hiking.

The history of the recreational snowmobile has been relatively short. Research dealing with the ownership and operation of snowmobiles has similarly had a short history. Many of the studies were accomplished during the snowmobile's peak in popularity. Recently, from 1977-1983, investigations into the trends, attitudes, and characteristics of snowmobilers have decreased. This decrease in interest in snowmobile research seems to correspond with a general trend away from one-season recreational vehicles and towards three-wheeled and other types of all-season, all-terrain vehicles.

#### Method

The method of data collection for this study was a mail survey instrument designed in cooperation with the North Dakota State Parks and

Recreation Department. The North Dakota State Motor Vehicle Department provided a random sample of 2,100 registered snowmobile owners drawn from the complete list of nearly 10,000 snowmobiles registered in North Dakota in 1983. Of the list of 2,100 snowmobile owner names, only 1,961 were utilized; the remaining were not used because they were duplicates or registered to governmental agencies.

The survey instrument was pretested during April 1983 when it was mailed to a pilot sample of 40 registered snowmobile owners, separate from the 1,961 snowmobile owners who were later surveyed. Of the 40 surveys mailed, 13 were completed and returned for a 33 percent response rate. A computer program that was developed for summarizing and analyzing the results was tested with the pretest response. Minor modifications of both the computer program and the survey instrument itself were then implemented.

The survey instrument (Appendix A) consisted of four general sections: 1) socioeconomic characteristics of the snowmobile owner; 2) general characteristics of snowmobile(s); 3) the nature of participation in recreational snowmobiling; and 4) the self-assessed needs and attitudes for improvement of the sport of snowmobiling in North Dakota.

Survey instruments and self-addressed postpaid envelopes were mailed bulk rate to 1,961 registered snowmobile owners on May 9, 1983. A short letter explaining the purpose of the survey and expressing the confidential nature of the information was also included. Of the 1,961 surveys mailed, 366 were completed and returned for a 19 percent response rate.

On May 26, 1983 a second bulk rate mailing of the survey form and companion letter was sent to the remaining 1,635 registered owners. Of this mailing, 246 completed surveys were returned for a 15 percent response rate, bringing the overall response to 32 percent.

A third mailing took place on June 14 when the remaining 1,400 registered owners were sent the survey instrument, a postpaid envelope, and the followup companion letter by first class mail. From this mailing, 569 completed surveys were returned for a return rate of 41 percent, or 61 percent overall.

A telephone followup approximately two weeks after the third mailing was used to contact 100 registered snowmobile owners. Of the 100 owners telephoned, 47 were contacted and asked an abbreviated set of questions for an added 2 percent total survey response rate. The total response rate for the three mailings and the followup telephone survey was 63 percent or 1,228 returned questionnaires.

Three mailings and a telephone followup facilitated a check for nonresponse bias.<sup>1</sup> Statistical tests for the presence of bias due to nonresponse did not indicate it was present for several variables checked.

---

<sup>1</sup>Nonresponse bias can affect survey results when estimates of variables are skewed due to the influence of nonrespondents.

Results

Owner Characteristics

The average age of a registered snowmobile owner<sup>2</sup> (RSO) was 44.3, with the modal group being 41-50 years and with a range of less than 10 years to over 70 years (Table 1). A comparison of 1973 and 1983 operators' ages indicates an increase in the age of operators during this 10-year period.

TABLE 1. AGE GROUPS OF SNOWMOBILE OWNERS AND OPERATORS IN NORTH DAKOTA, 1973 AND 1983

Age Group	1983		All Operators			
	Owners	Family Members	1983		1973 <sup>a</sup>	
			Number	Percent	Number	Percent
0-10	0.2%	3.3%	90	2.4	347	7.6
11-20	2.6	27.8	766	20.8	1,626 <sup>b</sup>	35.5
21-30	10.0	18.6	596	16.1	693 <sup>c</sup>	15.2
31-40	23.0	14.9	633	17.2	877 <sup>d</sup>	19.2
41-50	29.0	17.8	777	21.2		
51-60	23.0	12.1	559	23.0	1,030	22.5
61-70	10.0	4.7	232	10.0		
70+	1.5	0.8	36	1.0		
	100.0%	100.0%	3,689	100.0	4,583	100.0

<sup>a</sup>Thompson, 1973.

<sup>b</sup>For 11-19 year olds.

<sup>c</sup>For 20-29 year olds.

<sup>d</sup>For 30-39 year olds.

SOURCE: Survey of registered snowmobile owners, 1983 (question 5).

A snowmobile safety course is available for operators between the ages of 12 and 15. Six percent of the RSOs indicated there were operators in that age group in their household. Eighty-nine percent had completed the safety course.

Owners of registered snowmobiles represented a disproportionately higher percentage of resident county populations in urban than rural counties (Figure 1) (Appendix Table B1) in both 1973 and 1983. This implies fewer rural residents either own or register snowmobiles. Urban residents may feel more impelled to register since they usually do not ride on their own land.

<sup>2</sup>It is actually respondent characteristics that are presented. They, however, represent the characteristics of all registered snowmobile owners. No similarities should be drawn with owners of unregistered snowmobiles since that is a separate population.

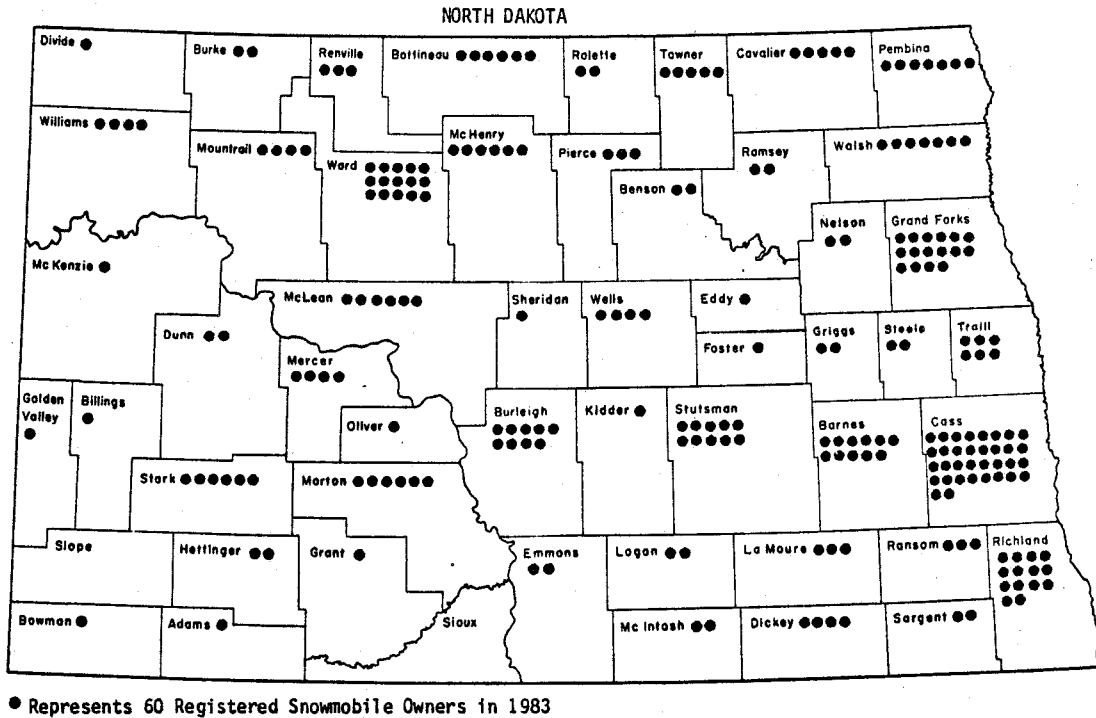


Figure 1. Home County of Registered Snowmobile Owners in 1983

Further evidence of the urbanness of RSOs is that 48.8 percent stated they lived in a town or city, 11.8 percent were rural nonfarm residents, and 39.3 percent lived on a ranch or farm. Thompson's 1973 survey indicated a similar percentage (39.7 percent) lived on a ranch or farm. North Dakota's total populace was 56 percent rural in 1970 and 51 percent in 1980 (U.S. Census of Population).

Nearly all RSOs were male (92 percent); the sex of other snowmobile operators in the family was not asked.

The average education level of RSOs in 1973 was 12.4 years compared to a modal group of "some college" for RSOs in 1983 (Table 2). The median education level for North Dakota was 12.5 years in 1980 for persons 25 years old and over; therefore, education is not a good indicator of snowmobile use or ownership potential.

Occupations of the 1983 RSO sample were similar to those for the 1973 sample. Approximately one-third were farmers or ranchers (Appendix Table B2), another 9 percent were laborers, and about 8 percent were retired.

Membership in snowmobile clubs had decreased considerably since Thompson's 1973 survey. Membership declined from 26.7 percent in 1973 to only 6.6 percent in 1983 (Table 3). Of those who were members of a local club,

TABLE 2. EDUCATION LEVELS OF REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA IN 1973 AND 1983

Education Level	1983	1973 <sup>a</sup>
	percent	
<8 years	3.0	
8 to 10 years	18.8	
High School	27.9	
Some College	30.4	Mean = 12.4 years
College Graduate	12.7	
Some Graduate Study	2.2	
Graduate Degree	5.0	
	<u>100.0</u>	

<sup>a</sup>Thompson, 1974.

SOURCE: Survey of registered snowmobile owners, 1983 (question 26).

TABLE 3. SNOWMOBILE CLUB MEMBERSHIP OF REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA, 1973 AND 1983

	Percent of Survey Respondents	
	1983	1973 <sup>a</sup>
Local Club Member	6.6	26.7
Do Not Belong To A Club	<u>93.4</u>	<u>73.3</u>
	<u>100.0</u>	<u>100.0</u>

<sup>a</sup>Thompson, 1973.

SOURCE: Survey of registered snowmobile owners, 1983 (question 4).

about two-thirds belonged to Snowmobile North Dakota, a statewide organization made up of local snowmobile clubs.

Snowmobile owners' characteristics in 1983 were like those reported by Thompson for 1973. There are some minor differences between the socioeconomic characteristics of RSOs and the overall North Dakota populations. Testing for statistical significance between the two studies was not done, but apparent differences are noted.

Snowmobile Characteristics

Artic Cat continued to be the most popular snowmobile make among RSOs in North Dakota in 1983 as it was in 1973 (Table 4). This reflects the fact

TABLE 4. BRAND NAMES OF REGISTERED SNOWMOBILES IN NORTH DAKOTA, 1973 AND 1983

Brand Name	Percent of Registered Snowmobiles	
	1983	1973 <sup>a</sup>
Artic Cat	27.4	36.5
Ski Doo	19.8	15.3
Polaris	12.7	13.9
John Deere	4.1	8.2
Scorpion	5.9	5.3
Yamaha	2.0	3.5
Evinrude	2.1	2.1
Rudd	2.1	2.0
Chaperal		1.7
Sno-Jet	5.0	1.5
Moto Ski	2.9	1.5
30 Others	16.0	8.5
	<u>100.0</u>	<u>100.0</u>

<sup>a</sup>Thompson, 1974.

SOURCE: Survey of registered snowmobile owners, 1983 (question 1).

that a majority of new snowmobiles were purchased prior to the mid-seventies when Artic Cat was selling the greatest number of machines. Ski Doo and Polaris each have about one-half of Artic Cat's market share of 36.5 percent with 15.3 percent and 13.9 percent, respectively. Snow sleds that can be towed behind a snowmobile were owned by one-fourth of the RSOs in 1983.

As with snowmobile makes, engine sizes remained almost constant over the last 10 years because most of the snowmobiles registered in North Dakota in 1983 were purchased 8 or 10 years earlier.

Perhaps the most significant finding of this study is the trend of what is happening to the age of registered snowmobiles in North Dakota. Less than 1 percent of the RSOs in North Dakota in 1983 had purchased new machines within a year (Figure 2). Three-fourths of all registered snowmobiles in North Dakota are 1974 models or older. Consistent with that, Thompson found nearly one-half of the 1973 RSOs had purchased a new machine within a year of her survey. Further, Schnaser (1971) reported fully 85 percent of a 1971 sample owned snowmobiles that were less than one year old.

Many hypotheses may be developed for the decline in the number of new snowmobiles purchased in North Dakota over the past ten years:

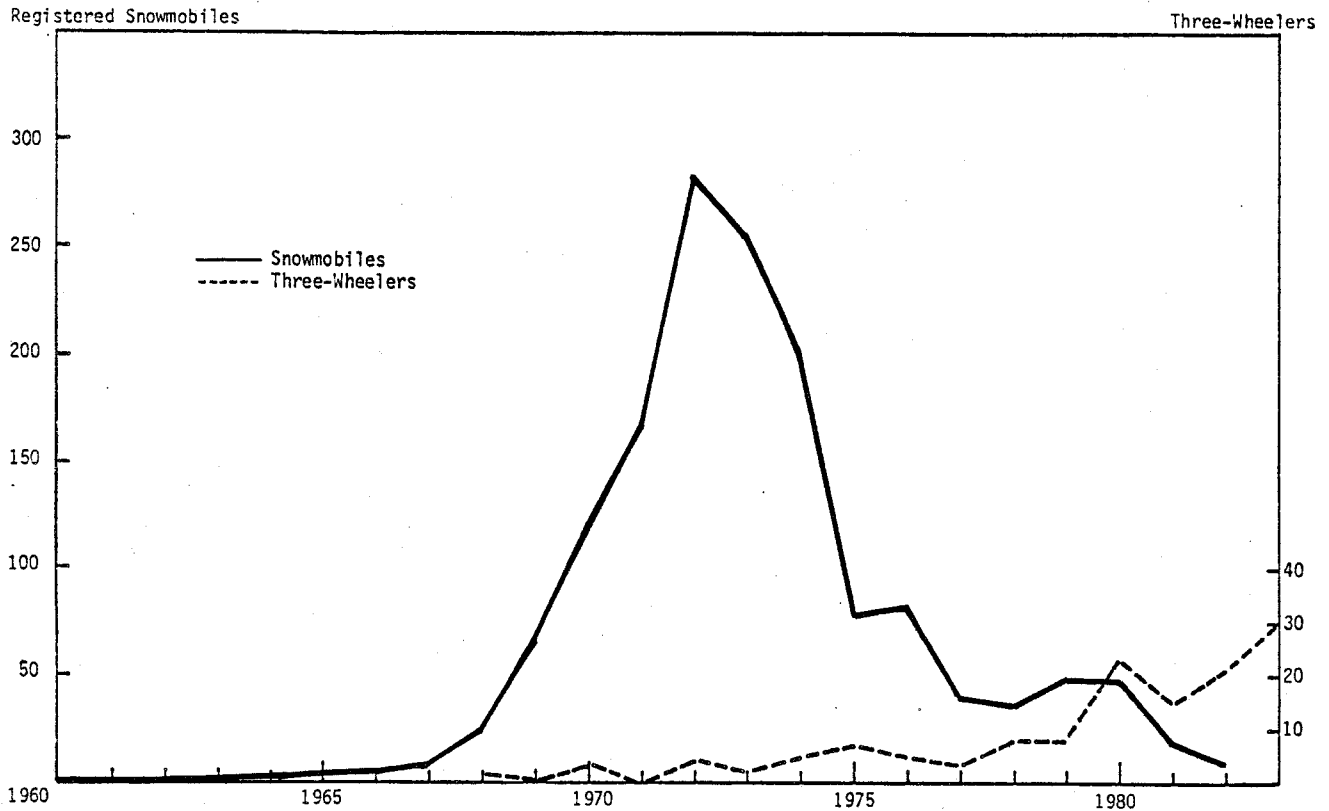


Figure 2. Model Year of Snowmobiles Registered and Three-Wheelers Owned by Registered Snowmobile Owners in North Dakota

- the boom in new snowmobile purchases coincided with the very high crop prices of the early seventies
- winter sports enthusiasts are more mobile and go elsewhere to recreate
- North Dakota residents go south for the winter
- gasoline prices rose during the tail end of the peak in snowmobile sales and dampened interest
- other outdoor sports have replaced snowmobiling (e.g., cross-country skiing or three-wheeling)
- several bad winters (winters without snow) have reduced interest

Of the above hypotheses, the last three deserve some discussion.

The drop in new snowmobile sales has been accompanied by a rise in the sales of three-wheeled all-terrain vehicles (ATVs or three-wheelers). Over 10 percent of RSOs in North Dakota also own at least one three-wheeler, and 80 percent of those three-wheelers are less than five years old (Figure 2). Sanderson (1983) notes that three-wheelers have a real appeal to snowmobilers;

sales have doubled every year with the South and northern Midwest leading. Three-wheeled ATVs can be operated year-round, unlike tracked snowmobiles that can only be operated when there is sufficient snowcover. As well as having a 12-month season, three-wheelers can be operated over a wider range of terrain than can snowmobiles.

The lack of adequate snow cover for recreational snowmobiling over much of North Dakota has had deleterious effects on the sport. Outdoor recreation enthusiasts appear to be reluctant to invest in a sport so dependent on the whims of the weather.

In summary, machine characteristics have changed very little over the last 10 years, primarily because the stock of machines has not changed. There may have been many influences that worked to limit snowmobiling; perhaps most important has been the introduction of an economical, year-round ATV. The following section will discuss participation characteristics of RSOs, including where they prefer to snowmobile.

### Participation in Snowmobiling

The previous section gave an indication of the popularity of snowmobiling as a winter sport in North Dakota. There have been very few purchases of new machines in the past 8 or 10 years as shown in Figure 2. Not included in that figure is the market for used snowmobiles in the state. The number of years an RSO has owned at least one snowmobile is an indication of both new and used machine purchases, and shows a similar trend (Figure 3). A large majority of RSOs have owned a snowmobile for 10 years or more, leaving only a few RSOs as having entered the sport in recent years.

People own snowmobiles for a variety of reasons from pleasure riding to racing. RSOs in North Dakota ranked pleasure riding as the number one reason for owning snowmobiles in 1973 and again in 1983 (Table 5). Emergency use was ranked second in 1983, while RSOs reported spending 17.6 percent of their snowmobiling time in 1973 for emergency use. The difference is the distinction between owning a snowmobile for use in emergency situations and having to use one in an emergency.

If the reasons for owning a snowmobile in North Dakota have not changed, then the decline in new snowmobile purchases must be due to other factors. One potential reason suggested above is the availability of a place to operate snowmobiles. Although the way the question was posed to RSOs was different on the 1983 survey than the 1973 survey (Thompson), the places they prefer to snowmobile have not changed much. Private property was ranked highest for the 1983 survey, with personal private property first and that of friends or relatives ranked second (Table 6). Designated snowmobile trails were ranked next to last by RSOs in 1983 as places where they snowmobile. This could be due to several factors which will be discussed below.

Availability of a place to snowmobile relative to the RSO's home affects where and how often they snowmobile different areas. The average one-way distance RSOs transported their snowmobiles to a snowmobile area in 1983 was 30.3 miles for a one-day outing. Thompson found RSOs willing to travel greater



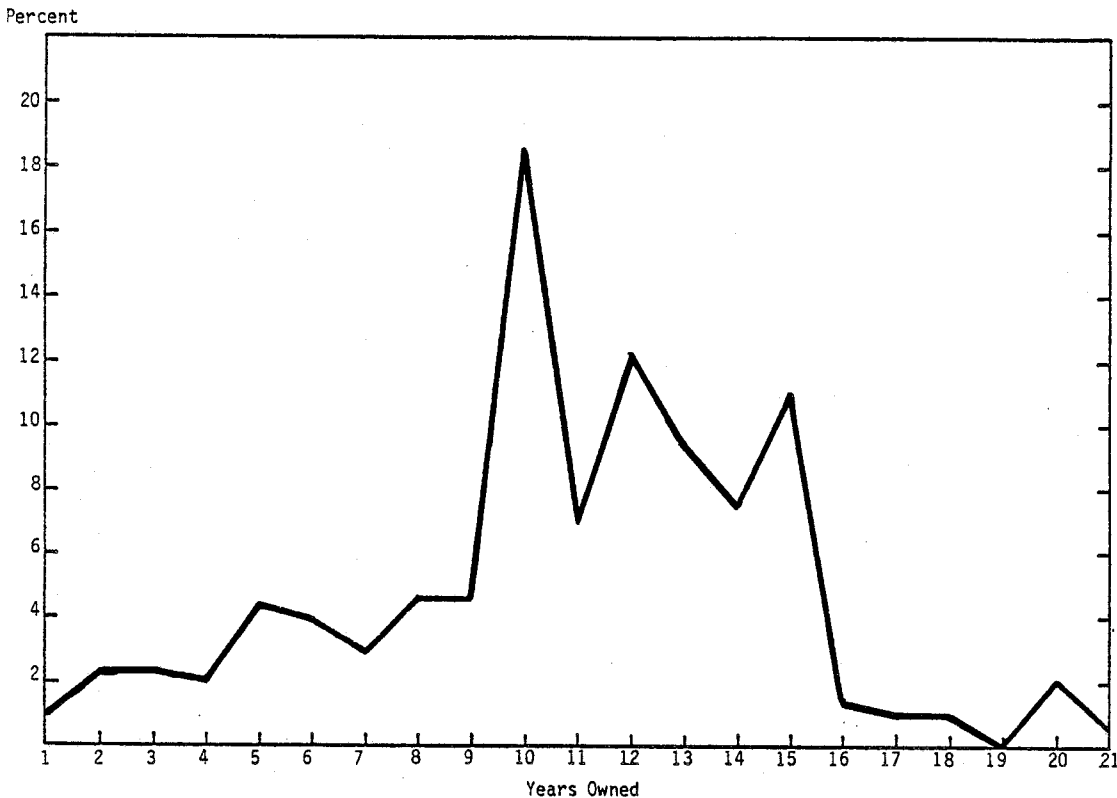


Figure 3. Number of Years Respondents Owned a Snowmobile

distances on weekends than weekdays, although the overall distances reported for this study were slightly greater than in 1973 (Table 7).

The average distance a registered snowmobile was driven declined from 288 to 231 total miles (20 percent decline) between the 1981-82 and the 1982-83 seasons. The lack of adequate snow cover in the winter of 1982-83 appears to be the major factor responsible for this decline.

Over 50 percent of all registered snowmobiles were driven less than 100 miles during the 1981-82 and 1982-83 snowmobile seasons (Table 8). Less than one-half of the RSOs do most of the recreational snowmobiling that occurs in North Dakota.

Most RSOs have not left North Dakota to snowmobile. Only 44.7 percent had ever traveled to other states to participate in snowmobiling activities. The motivation for leaving North Dakota to snowmobile varied from the better terrain found in other states to participation in racing competition (Table 9).

Of the RSOs who traveled out of state to snowmobile, 61 percent visited Minnesota as compared to 65.5 percent in Thompson's 1973 survey (Figure 4). Minnesota's popularity for snowmobiling can be explained by its close proximity for North Dakota RSOs and also by its varied topography, forest vegetation, and snow conditions. The mountain states of Montana and Wyoming and the Black Hills of South Dakota attract North Dakota RSOs for much the same reasons: they provide a close and varied snowmobiling alternative.

TABLE 5. REASONS WHY REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA OWN SNOWMOBILES, 1983 AND 1973

Reason <sup>a</sup>	1983 Rank <sup>b</sup>	1973 Percent of Time <sup>c</sup>
Pleasure Riding	1.09	30.9
Emergency Use	2.69	17.6
Friends Own A Snowmobile	3.19	
Agricultural	4.26	
Transportation To Other		
Winter Sports	4.59	
Transportation To Work	4.67	
Nonagricultural Business Use	5.33	
Racing and Competition	6.48	7.9
Work Use		14.9
Transportation		17.6
Sports		14.6
		<u>100.0</u>

<sup>a</sup>Reasons did not coincide exactly for the 1983 and 1973 studies.

<sup>b</sup>Respondents were asked to rank from 1 to 8 their reasons for owning a snowmobile, with 1 being the most important reason. These ranks are the means of the individual ranks.

<sup>c</sup>Thompson, 1974.

SOURCE: Survey of registered snowmobile owners, 1983 (question 7).

TABLE 6. WHERE SNOWMOBILING IS DONE BY REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA, 1983

Property Type	Rank <sup>a</sup>
My Own Property	1.81
Property of Friend or Relative	2.43
Public Property	2.51
Private Property Of Others	3.28
Designated Snowmobile Trails	3.64
Land Ownership Unknown	4.02

<sup>a</sup>Respondents were asked to rank property types from 1 to 6, with 1 being where they snowmobile most often.

SOURCE: Survey of registered snowmobile owners, 1983 (question 8).

TABLE 7. ONE-WAY DISTANCES REGISTERED SNOWMOBILE OWNERS TRANSPORTED THEIR SNOWMOBILES TO SNOWMOBILE AREAS, 1973 AND 1983

Distance	Percent of Registered Owners		
	1983	1973 weekdays <sup>a</sup>	1973 weekends <sup>a</sup>
0 miles	1.8	6.3	4.7
01-24 miles	58.6	83.0 <sup>b</sup>	54.8 <sup>b</sup>
25-49 miles	15.4	5.4	13.9
50-99 miles	17.8	3.5	14.6
100-149 miles	4.8	1.2	6.9
More Than 150 Miles	1.6	0.6	5.1
	<u>100.0</u>	<u>100.0</u>	<u>100.0</u>

<sup>a</sup>Thompson, 1974.

<sup>b</sup>Sum of "less than one mile" and "1-24 miles."

SOURCE: Survey of registered snowmobile owners, 1983 (question 11).

The typical snowmobile outing in North Dakota was found to be one day in length, and only 18.8 percent of the RSO respondents reported that a two-or-more-day outing was typical.

The average one-way distance RSOs transported their snowmobiles for a one-day outing in 1983 was 30.3 miles (Table 10). The maximum one-way distance RSOs would transport their snowmobiles was 65.7 miles; the difference is the distance their snowmobiles are typically transported versus the farthest their snowmobiles have or will be transported on a one-day outing.

The amount of time RSOs spent snowmobiling in North Dakota during a typical week with adequate conditions varied from 0 to over 40 hours for an average of 9.5 hours (Table 11).

North Dakota RSOs snowmobiled an average of 118.4 miles during the 1982-83 season. In comparison they would like to spend an average of 9.5 hours snowmobiling during a typical week. If they travel 5 miles per hour for 9.5 hours for 6 or 8 winter weeks, it would represent well over 300 miles per season. It appears that the lack of adequate snow conditions in 1983, lack of interest, or other circumstances prevent most North Dakota RSOs from participating in recreational snowmobiling at the level they consider typical.

The North Dakota Parks and Recreation Department maintains seven snowmobile trails in North Dakota with funds from the Snowmobile Trail Tax Fund financed by snowmobile registration fees. Only 17.5 percent of RSOs in 1983 had snowmobiled on any of these trails. The snowmobile trail most frequently used by North Dakota RSOs was the Metigoshe trail (60.7 percent) (Table 12). The other six snowmobile trails were used considerably less often with 14.1 percent using the Rough Rider Trail and 8 percent or less using the other trails. Proximity to populations did not affect trail use, as several trails are nearer to population centers than the Metigoshe trail.

TABLE 8. TOTAL DISTANCES REGISTERED SNOWMOBILES WERE DRIVEN, 1981-82 AND 1982-83

Distance (Miles)	Percent 1981-82	Percent 1982-83
	<u>Owners</u>	
0- 50	52.5	61.0
51-100	17.5	14.0
101-150	4.0	5.1
151-200	8.8	6.4
201-250	1.7	3.2
251-300	5.6	3.5
301+	9.9	6.8
	100.0	100.0

$\bar{x}$  = 148.2 (1981-82)  
118.4 (1982-83)

Other Family Members

0- 50	48.3	57.3
51-100	18.6	15.4
101-150	4.8	3.3
151-200	9.3	8.2
201-250	2.1	1.8
251-300	6.3	4.6
301+	10.6	9.4
	100.0	100.0

$\bar{x}$  = 142.1 (1981-82)  
113.5 (1982-83)

SOURCE: Survey of registered snowmobile owners, 1983 (question 12b).

Of the 82.5 percent of North Dakota RSOs who had not used state snowmobile trails, most had not because either the distances to transport snowmobiles were too great (33.5 percent) or they were not aware the trails existed (33.5 percent) (Table 13). One-third of the state is not within 66 miles of a state trail (Figure 5), the maximum one-way distance RSOs would travel, and a much higher fraction is not within 30 miles, the average distance traveled. Nearly one-quarter of all RSOs responding (23.8 percent) were unaware of the snowmobile facilities maintained by North Dakota Parks and Recreation Department and financed by the Snowmobile Trails Tax Fund.

A majority of the North Dakota RSO respondents (59.6 percent) were unaware that \$6 of the \$8 they paid to register their snowmobile was placed in the Snowmobile Trail Tax Fund for the development and maintenance of snowmobile trails.

TABLE 9. REASONS WHY REGISTERED SNOWMOBILE OWNERS LEFT NORTH DAKOTA FOR SNOWMOBILING PURPOSES

Reason	1983 Percent
Better Terrain	18.7
Better Snow Conditions	18.6
Friends or Relatives	16.7
Different Terrain	13.6
Better Facilities	8.9
Club Trip	3.5
Racing Competition	1.5
Other	18.5
	<u>100.0</u>

SOURCE: Survey of registered snowmobile owners, 1983 (question 13a).

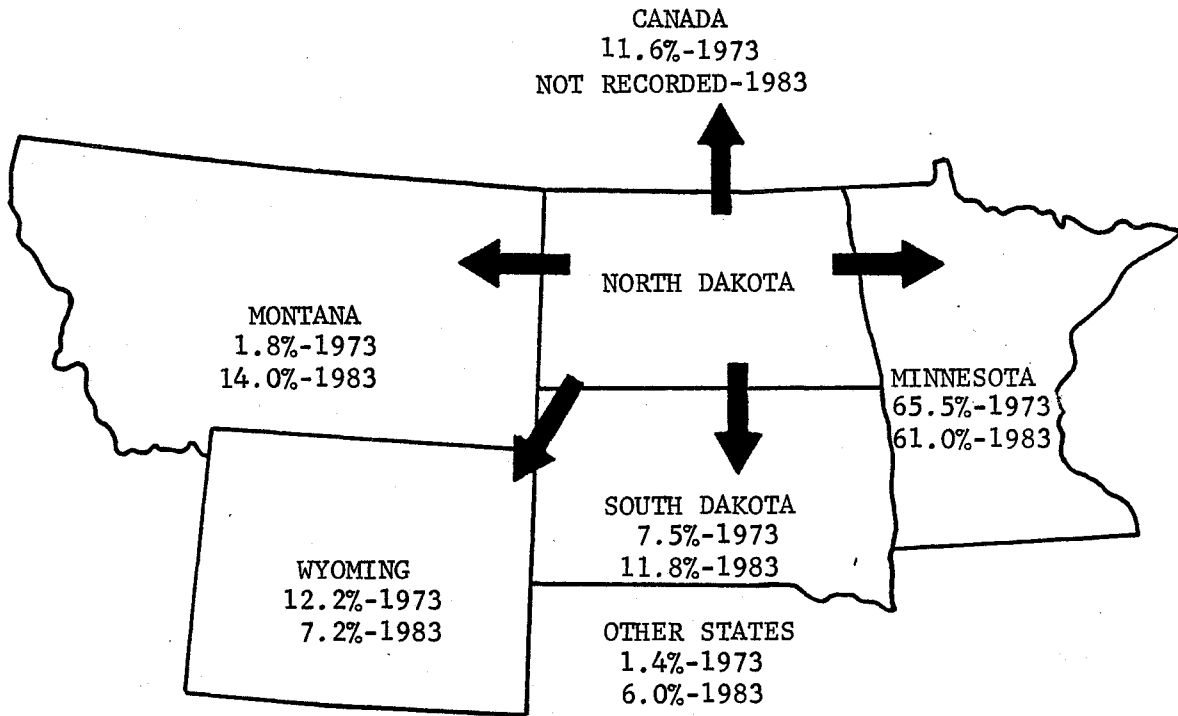


Figure 4. Out-of-State Trips Taken by Snowmobilers, 1973 and 1983

SOURCE: Thompson, 1974 and Survey of Registered Snowmobile Owners, 1983 (question 13b).

TABLE 10. MAXIMUM DISTANCE REGISTERED SNOWMOBILE OWNERS WOULD TRANSPORT SNOWMOBILES FOR A ONE-DAY OUTING, 1983

Distance (Miles)	1983 Percent
0- 50	60.4
51-100	29.3
101-150	5.4
151-200	3.1
201+	1.8
	<u>100.0</u>

$$\bar{x} = 65.7$$

SOURCE: Survey of registered snowmobile owners, 1983 (question 15).

TABLE 11. HOURS SPENT SNOWMOBILING BY RSO DURING A TYPICAL WEEK, 1983

Hours	Percent
0- 5	52.8
6-10	28.5
11-15	5.2
16-20	7.2
21-25	1.9
26+ <sup>a</sup>	4.4
	<u>100.0</u>

$$\bar{x} = 9.5$$

<sup>a</sup>Responses of more than 168 hours were eliminated.

SOURCE: Survey of registered snowmobile owners, 1983 (question 15).

Expenditures incidental to snowmobiling, other than the snowmobile purchase and travel/transportation expenses, include food, beverage, and lodging expenses when snowmobiling, snowmobile fuel, entrance fees, snowmobile clothing, and snowmobile repairs. A North Dakota RSO would spend \$34.72 on a typical one-day snowmobile outing (Table 14). One-day outing expenditures would include food and beverage, snowmobile fuel, and entrance fees. Entrance fees would include those charged to race competitively, admission to state or national parks, or admittance to other snowmobile areas.

TABLE 12. USE OF STATE SNOWMOBILE TRAILS BY REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA, 1983

Trail	Percent of Total Trail Use
Metigoshe Trail	60.7
Rough Rider Trail	14.1
Fort Ransom Trail	8.4
Sheyenne Valley Trail	7.0 <sup>a</sup>
Moonlighter Trail	5.6
Charbonnean Trail	2.3
Red River Trail	1.9
	<u>100.0</u>

<sup>a</sup>Fort Ransom Trail was not open to snowmobiling in 1982-83 and is now combined with the Sheyenne Valley Trail.

SOURCE: Survey of registered snowmobile owners, 1983 (question 17).

TABLE 13. REASONS WHY 82 PERCENT OF REGISTERED SNOWMOBILE OWNERS HAD NOT USED THE SEVEN STATE SNOWMOBILE TRAILS, 1983

Reason	1983 Percent
Distance Too Great	33.5
Unaware of Trails	33.5
Prefer Other Areas	15.7
Other	17.3
	<u>100.0</u>

SOURCE: Survey of registered snowmobile owners, 1983 (question 17b).

A North Dakota RSO would spend \$112.40 on a typical two-day snowmobile outing. Two-day outing expenditures include food and beverage, lodging, snowmobile fuel, and entrance fee costs. Typical seasonal expenditures for snowmobile clothing and snowmobile repairs would be \$164.12.

#### Characteristics of Three-Wheeler Owners

Due to the rapid increase in the number of three-wheeled recreational vehicles in North Dakota, their overall popularity in all-season recreation, and potential conflicts with snowmobiles, the characteristics of three-wheeler owners were compared to RSOs without three-wheelers. Industry sources estimate there are currently between 40,000 and 50,000 three-wheelers in North

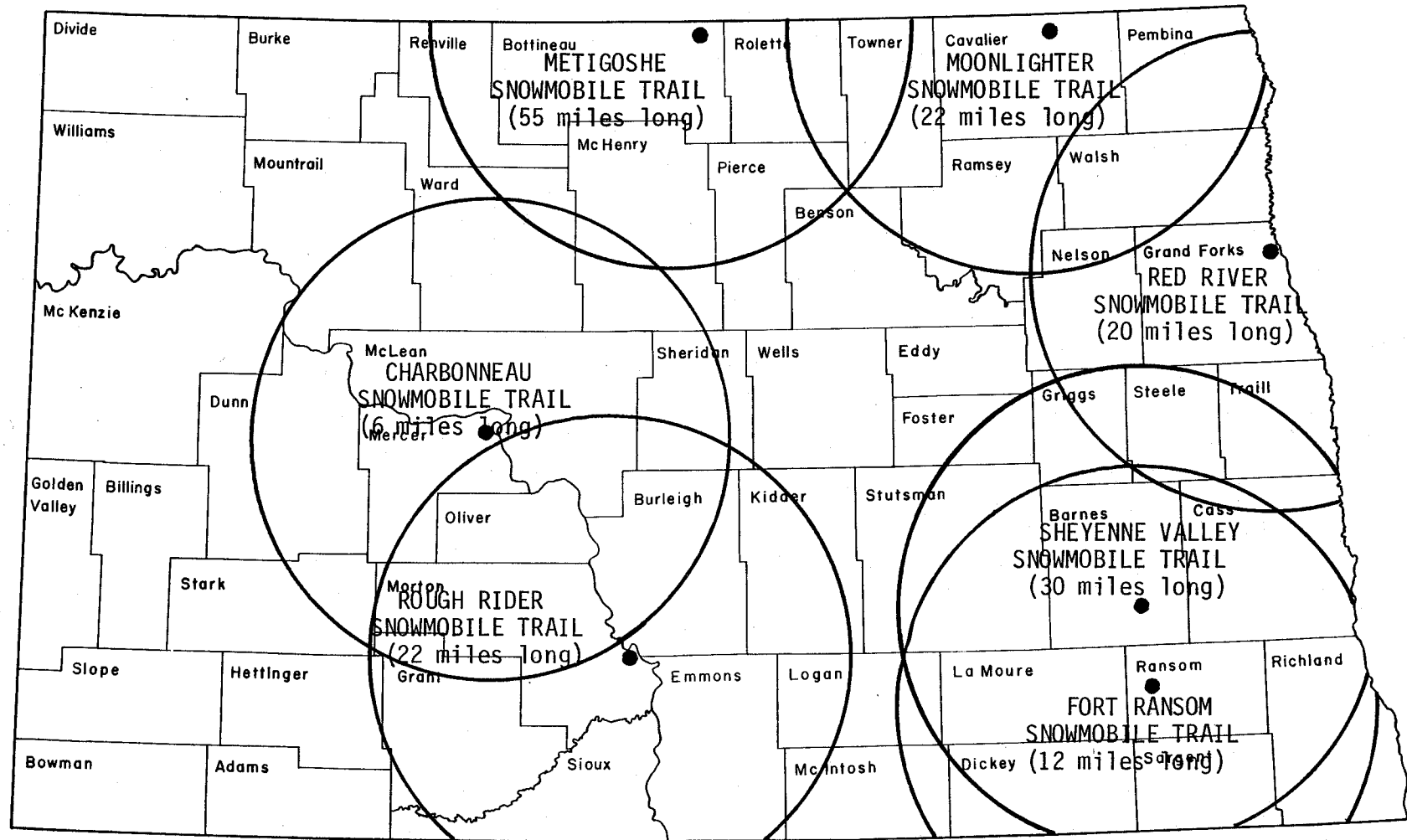


Figure 5. State Snowmobile Trails Within 66 Miles of North Dakota Locations



TABLE 14. TYPICAL EXPENDITURES OF NORTH DAKOTA REGISTERED SNOWMOBILE OWNERS WHILE SNOWMOBILING, 1983

Expenditures	A One Day Snowmobile Outing	A Two Day Snowmobile Outing	Season
Food and Beverage	\$17.90	\$ 40.10	--
Lodging	--	38.89	--
Snowmobile Fuel	11.63	24.46	--
Entrance Fees	5.19	8.95	--
Snowmobile Clothing	--	--	\$ 82.03
Snowmobile Repairs	--	--	82.09
TOTAL	\$34.72	\$112.40	\$164.12

SOURCE: Survey of registered snowmobile owners, 1983 (question 24).

Dakota and expect that number to increase by nearly 8,000 in 1984. Their presence could present management problems for the state's snowmobile trails.

The characteristics<sup>3</sup> of RSOs who also own three-wheeled recreational vehicles were very similar to RSOs who did not own three-wheelers. The average age of a three-wheeler owner (TWO) was 43.8. This is not significantly different<sup>4</sup> from the other RSOs. No major differences were noted in regards to the highest level of education completed, reasons for owning a snowmobile, or the total distance snowmobiles were driven during the winters of 1981-1982 and 1982-1983.

A difference was noted concerning the areas in which TWOs live. Approximately 71.2 percent of the TWOs stated they lived on a farm or ranch, 24.5 percent lived in a town or city, and 4.3 percent were rural nonfarm residents. In comparison, only 34.3 percent of the other RSOs stated that they lived on a farm or ranch, 52.6 percent lived in a town or city, and 13.1 percent were rural nonfarm residents.

Occupational differences were also present between the two RSO groups. Approximately 66.4 percent of the TWOs stated that their present occupation was farming or ranching. This was stated by only 29.9 percent of the other RSOs.

<sup>3</sup>The characteristics presented are of respondent registered snowmobile owners who also own three-wheeled recreational vehicles. No similarities should be drawn with three-wheeler owners who own unregistered snowmobiles or who do not own a snowmobile since these are separate populations.

<sup>4</sup>Statistically significant differences were based on a 90 percent confidence interval.

In response to the question of whether three-wheelers should be licensed in North Dakota, 67.1 percent of the TWOs thought that licensing should not be required. In contrast to this, 62.1 percent of the RSOs who do not own three-wheelers stated that licensing should be required.

Honda is the most popular three-wheeler make among RSOs in North Dakota with 70.8 percent of the market share (Table 15). Yamaha is the next most popular with 14.6 percent of the market share.

TABLE 15. BRAND NAMES OF THREE-WHEELERS OWNED BY REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA, 1983

Brand Name	Percent of Three-Wheelers
Honda	70.8
Yamaha	14.6
Kawasaki	3.7
Heald	2.9
Pacesetter	1.5
Brute	0.7
Farm Scat	0.7
ATC	0.7
Suzuki	0.7
Not Specified	3.7
	<u>100.0</u>

SOURCE: Survey of registered snowmobile owners, 1983 (question 31).

Although three-wheelers may be used as a substitute for snowmobiles, only 6.9 of the TWOs stated that they planned to discontinue snowmobiling in the near future.

#### Attitudes and Preferences

The type of area most North Dakota RSOs (60.3 percent) prefer for snowmobiling includes both trails and play areas. Open play areas (28.0 percent) were their second preference, and designated trails (11.7 percent) were the least preferred choice.

The type of topography preferred by North Dakota RSOs was hilly nonforested, followed by hilly forested (Table 16). Level terrain, roadside ditches, and frozen lakes were also utilized. These findings paralleled Thompson's 1973 survey in which trails in wooded areas were most preferred followed closely in preference by large open areas.

TABLE 16. AREA (TOPOGRAPHY) PREFERRED BY NORTH DAKOTA RSOs FOR SNOWMOBILING, 1983 AND 1973

Type Of Area <sup>a</sup>	1983 Rank <sup>b</sup>	1973 Percent of Time Spent <sup>c</sup>
Hilly (Nonforested)	2.31	58.0
Hilly (Forested)	2.54	63.9
Level Terrain	2.55	--
Roadside Ditches	3.62	36.2
Frozen Lakes	3.94	--
Frozen Rivers	4.29	44.0 <sup>d</sup>

<sup>a</sup>Question and response for preferred area did not coincide exactly for the 1973 and 1983 studies.

<sup>b</sup>Respondents were asked to rank areas from 1 to 6 with 1 being the most preferred area.

<sup>c</sup>Thompson, 1974.

<sup>d</sup>Includes rivers and lakes.

SOURCE: Survey of registered snowmobile owners, 1983 (question 10).

The most preferred type of snowmobile area was a combination of trails and play areas with either nonforested or forested vegetation and hilly topography.

The average snowmobile trail length preferred by North Dakota RSOs in 1983 was 25.0 miles (Table 17). In comparison, Thompson (1974) found the preferred trail length to be 18.4 miles in 1973.

Secondary facilities considered necessary by North Dakota RSOs for snowmobile areas and trails were toilet facilities and warming shelters (Table 18). Other facilities such as trash barrels and telephones, not necessary to satisfy basic human needs, were considered of lesser importance.

The ranking of hazards encountered during snowmobiling by RSOs in 1983 corresponds relatively well with Thompson's 1973 study. Fences were considered the most serious hazard along with guy wires and utility poles (Table 19). In comparison, Thompson found that buried objects (including rocks) were the most serious hazard, followed by fences, guy wires, and utility poles. The emphasis placed on the hazards of fences, guy wires, utility poles, culverts, and marker posts indicates that much of the North Dakota RSO's snowmobiling time is spent traversing fields and open country or following public road ditches.

A majority (75.6 percent) of RSOs believed that enforcement of snowmobile registration is adequate in North Dakota. Nearly one-half (49.2 percent) of North Dakota RSOs believed all-terrain vehicles (ATVs or three-wheelers) should be registered. The reasons for registering included: ATVs have the same purpose as snowmobiles, ATVs are used on public roads, safety is a concern, and all motor vehicles should be licensed (Table 20).

TABLE 17. PREFERRED LENGTH OF SNOWMOBILE TRAIL BY NORTH DAKOTA REGISTERED SNOWMOBILE OWNERS, 1983 AND 1973

Trail Length (Miles)	1983	1973a
	Percent	Percent
0- 6	11.6	7.7
7-12	20.7	21.1
13-18	6.5	19.7
19-24	20.4	20.9
25-30	20.4	18.8
31-36	0.8	8.2
37-50	14.5	3.6 <sup>b</sup>
>50	5.1	--
	100.0	100.0

$\bar{x}$  = 25.0 (1983)  
18.4 (1973)

<sup>a</sup>Thompson, 1973.

<sup>b</sup>Listed as "other" greater than 36 miles.

SOURCE: Survey of registered snowmobile owners, 1983 (question 18).

TABLE 18. SECONDARY SNOWMOBILE FACILITIES PREFERRED BY NORTH DAKOTA RSOs, 1983

Type Of Facility	Rank <sup>a</sup>
Toilet Facilities	2.35
Warming Shelter	2.55
Parking	3.61
Trail Head Information	3.78
Fireplaces With Wood	4.26
Trash Barrels	4.58
Telephones	4.61
Other	6.32 <sup>b</sup>

<sup>a</sup>Respondents were asked to rank from 1 to 8 their preference for the above facilities in snowmobile areas, with 1 being the most preferred.

<sup>b</sup>55 percent of applicable other responses requested a restaurant open at night.

SOURCE: Survey of registered snowmobile owners, 1983 (question 19).

TABLE 19. HAZARDS CONSIDERED MOST IMPORTANT BY NORTH DAKOTA RSOs, 1983 AND 1973

Hazard <sup>a</sup>	1983 Percent <sup>b</sup>	1973 Percent <sup>c</sup>
Fences	23.4	66.9
Guy Wires, Utility Poles	21.7	59.1
Culverts and Marker Posts	11.3	55.7
Thin Ice	11.2	--
Rocks	9.3	--
Buried Objects	7.8	69.2 <sup>d</sup>
Dropoffs	5.2	42.9
Running Streams	2.4	31.5
Road Crossings	2.2	--
Low Visibility	1.9	--
Other Motorized Vehicles	1.8	22.2
Ice Buckles on Lakes	1.0	--
Low Beamed Bridges	0.5	15.8
Railroad Crossings	0.3	16.6
	<u>100.0</u>	

<sup>a</sup>Hazards and ranking method did not coincide exactly for the 1983 and 1973 surveys.

<sup>b</sup>Percent of total responses.

<sup>c</sup>Thompson, 1974.

<sup>d</sup>Includes "rocks."

SOURCE: Survey of registered snowmobile owners, 1983 (question 20).

The most popular reason for not having to license ATVs was they are not driven on public roads. The second reason for the nonregistration of ATVs was that it was felt licenses are needed on too many other things.

Eighty-seven percent of North Dakota RSO respondents in 1983 do plan to continue snowmobiling for the next several years. It follows that 13.0 percent of RSOs do not intend to continue snowmobiling. The RSOs that do not plan to continue snowmobiling are not being replaced by new snowmobiling enthusiasts, resulting in a decline in the recreational snowmobiler population. This decline may be caused by the various factors addressed earlier in this report.

Old age and illness accounted for 41.3 percent of the reasons cited by RSOs for not continuing to snowmobile for the next several years (Table 21). Plans to sell present snowmobile(s) was the next largest response (38 percent). Interestingly, plans to purchase a three-wheeled ATV accounted for only 3.3 percent of the reasons for not continuing to own a snowmobile.

The North Dakota RSOs surveyed considered marking and grooming of snowmobile trails as the most important uses of the snowmobile tax money (Table 22). Youth safety training, leasing areas for trails, and shelters were also considered important uses of these monies. Expansion of existing

TABLE 20. REASONS FOR OR AGAINST LICENSING THREE-WHEELERS

Reason For Licensing	Percent Of Respondents Answering "Yes, They Should Be Licensed"
Same Purpose As Snowmobile	34.9
Used on Roads	30.8
Safety Reasons	12.2
All Motorized Vehicles Should Be Licensed	11.9
Theft Protection	4.1
All Others	6.1
	<u>100.0</u>

Reason For Not Licensing	Percent Of Respondents Answering "No, They Should Not Be Licensed"
Not Driven On Public Roads	76.3
Need Licenses For Too Many Things	14.2
All Others	9.5
	<u>100.0</u>

SOURCE: Survey of registered snowmobile owners, 1983 (question 32).

TABLE 21. REASONS FOR NOT CONTINUING TO SNOWMOBILE

Reasons	Percent 1983 <sup>a</sup>
Plan To Sell Snowmobile	39.1
Too Old	38.0
Used Only For Emergency	7.6
Rather Purchase Three-Wheeler	3.3
Illness Prevents	3.3
All Others	8.7
	<u>100.0</u>

<sup>a</sup>Only applicable respondents.

SOURCE: Survey of registered snowmobile owners, 1983 (question 34).

TABLE 22. HOW NORTH DAKOTA REGISTERED SNOWMOBILE OWNERS FELT THE SNOWMOBILE TAX FUND MONIES SHOULD BE USED

Use	Rating <sup>a</sup>
Marking Trails	2.62
Grooming Trails	3.83
Youth Safety Training	3.90
Leasing Areas For Trails	4.15
Support Facilities (Shelters)	4.21
Adult Safety Training	5.19
More Information and Maps	5.21
Expansion of Existing Trails	5.36
Enforcement of Snowmobile Laws	5.58
Other	9.65

<sup>a</sup>Respondents were asked to rank choices of how snowmobile tax money is used from 1 to 10 with 1 being the most preferred choice.

SOURCE: Survey of snowmobile owners, 1983 (question 22).

trails, the printing and distribution of information and maps, adult safety training, and the enforcement of snowmobile laws were considered by RSOs to be the least important uses of the Trail Tax Fund money.

The changes and improvements in public trails considered most important by North Dakota RSOs was the addition of public snowmobile trails in their specific area. Also considered important was improved public relations between the snowmobiling public, appropriate governmental agencies, and other recreational groups.

### Summary and Conclusions

Characteristics of snowmobilers and their snowmobiles have not changed much in the 10-year period from 1973 to 1983. However, both registered snowmobiles and their owners are on the average older now than in 1973. Additionally, membership in snowmobile clubs has declined over the 10-year period.

Most snowmobilers have their machines for pleasure and emergency use. The majority of registered snowmobiles in North Dakota in 1983 are 1970 to 1974 models purchased during the height of snowmobiling. More recently, registered snowmobile owners have been purchasing three-wheelers rather than replacing their snowmobiles.

State snowmobile trails are available across North Dakota, yet are ranked last in terms of usage by type of land. Only 17.5 percent of registered snowmobile owners used state trails in 1983. Many of those who had not used trails had not because of distance, suggesting the addition of trails where

distance is a problem. Another one-third had not used trails because they did not know they existed, suggesting an information campaign may be necessary.

Many snowmobilers leave the state each year to snowmobile in neighboring states. Most do so looking for better or different terrain, better snow conditions, or to be with friends. None of these three characteristics can be affected by trail management within the state.

Three-fourths of the registered snowmobile owners felt that enforcement of snowmobile regulations, including registration, was adequate. Three-wheelers are seen as a potential problem by some snowmobilers, and one-half felt that three-wheeled recreational vehicles should be licensed. This suggests the need for a study of the use of three-wheelers on public lands, especially state snowmobile trails, and the feasibility of a registration system.

Over half (59.6 percent) of the survey respondents were unaware that \$6 of the \$8 snowmobile registration fee was placed in the Trail Tax Fund. Suggested uses of the Trail Tax fund include marking trails, grooming trails, youth safety, and leasing trails. Enforcement was ranked last in a list of nine potential uses of the fund.

Secondary snowmobile facilities preferred in order of rank include toilets, warming shelters, parking facilities, trail information, fireplaces, trash barrels, and telephones. These were not ranked highly as potential uses of the Trail Tax fund, but should be considered viable uses at high usage trails such as the Metigoshe Snowmobile Trail.

While 87 percent of the registered snowmobile owners indicated they plan to continue snowmobiling, the trends in active snowmobilers' ages, snowmobile ages, and the number of three-wheelers indicate the need to consider carefully long-term improvements in snowmobile facilities. It is especially important to include consideration for three-wheeled recreational vehicles in any new outdoor recreation facility plans. With the trend towards all-season recreation, future snowmobile facilities may need to accommodate year-round utilization. Other possible related uses that would make present and future public snowmobile trails multi-recreational are all-season ATV trails, hiking trails, bicycle trails, camping facilities, and running paths.

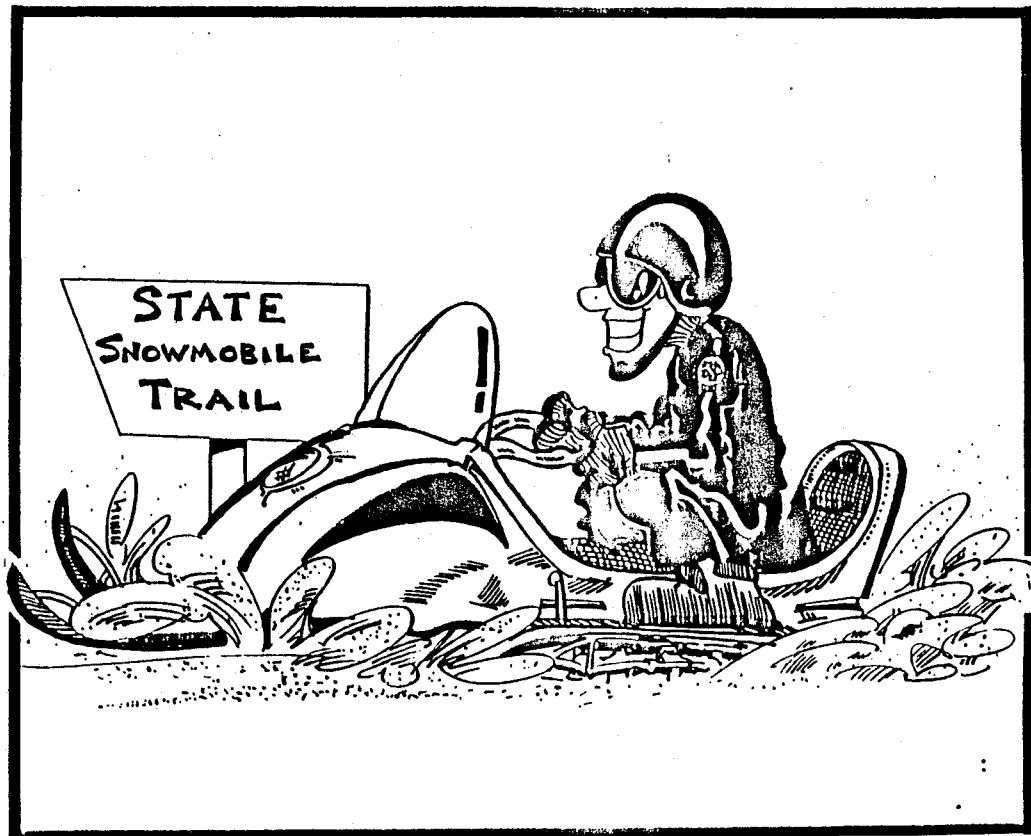
Public snowmobile trails developed by the North Dakota Parks and Recreation Department may need more publicity. Less than one-fifth of registered snowmobile owners have ever snowmobiled on any of these trails and nearly one-fourth of all those surveyed were unaware of the existence of the public trails. North Dakota snowmobilers should also be made aware of how their snowmobile registration fees are being utilized. Snowmobile trail maps and snowmobile tax fund information could be included in North Dakota's Snowmobile Laws handbook or otherwise made available during snowmobile registration.





APPENDIX A: REGISTERED SNOWMOBILE OWNERS SURVEY INSTRUMENT

# SNOWMOBILING IN NORTH DAKOTA





SNOWMOBILING IN NORTH DAKOTA - 1983

1. State Motor Vehicle Department records indicate that you are a registered snowmobile owner. Do you presently own a snowmobile?

YES IF YES, PLEASE COMPLETE THIS CHART FOR SNOWMOBILES OWNED

MAKE	SIZE	YEAR	IS IT REGISTERED?		EXAMPLE
			YES	NO	
POLARIS	1200 CC	1972	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
_____	_____	_____	YES	NO	
_____	_____	_____	YES	NO	
_____	_____	_____	YES	NO	
_____	_____	_____	YES	NO	

NO IF NO, PLEASE STOP AND RETURN THIS SURVEY. THANK YOU.

2. How many years have you owned at least one snowmobile? \_\_\_\_\_ Years

3. Do you own a snowmobile sled?

YES  
 NO

4. Do you belong to a local snowmobile club?

YES IF YES, WHICH ONE? \_\_\_\_\_

DOES YOUR CLUB BELONG TO SNOWMOBILE NORTH DAKOTA?  YES  
 NO

5. What are the ages of immediate family members, including yourself, that are snowmobile operators?

<u>AGE</u>	<u>AGE</u>
_____ Yourself	_____ Operator #4
_____ Operator #2	_____ Operator #5
_____ Operator #3	_____ Operator #6

6. If there are any operators between the ages of 12 and 15, please indicate if they have completed the North Dakota Snowmobile Safety Course.

YES IF YES, NUMBER OF OPERATORS COMPLETING THE COURSE: \_\_\_\_\_  
 NO

7. Please rank the following reasons for owning a snowmobile according to your preference. Indicate with a 1--the reason most preferred, 2--for the next most preferred, etc. for all 8 choices.

- PLEASURE RIDING
- FRIENDS OWN A SNOWMOBILE
- TRANSPORTATION TO OTHER WINTER SPORTS
- RACING AND COMPETITION
- AGRICULTURAL BUSINESS USES
- NONAGRICULTURAL BUSINESS USES
- TRANSPORTATION TO WORK
- EMERGENCY USE

8. Please rank the following properties for where your snowmobiling is done according to your use. Indicate with a 1--the property most frequently used by you, 2--the next most used, etc.

- MY OWN PROPERTY
- PROPERTY OF FRIEND OR RELATIVE
- PRIVATE PROPERTY OF OTHERS
- PUBLIC PROPERTY
- DESIGNATED SNOWMOBILE TRAILS
- LAND OWNERSHIP UNKNOWN

9. Where do you prefer to snowmobile?

- DESIGNATED TRAILS
- OPEN PLAY AREAS
- COMBINATION OF TRAILS AND PLAY AREAS

10. Please rank each of the following areas according to your preference for snowmobiling. Indicate with a 1--the most preferred, 2--for the next, to 6--for the least preferred.

- HILLY TERRAIN (FORESTED)
- HILLY TERRAIN (NONFORESTED)
- LEVEL TERRAIN
- FROZEN LAKES
- FROZEN RIVERS
- ROADSIDE DITCHES

11. On a typical one day outing, what is the average one-way distance that you transport your snowmobile to a public or private snowmobiling area?

MILES

12. What is the approximate total distance your snowmobiles were driven during the winters of 1981-1982 and 1982-1983?

	1981-1982	1982-1983
YOURSELF	_____ miles	_____ miles
OTHER FAMILY MEMBERS	_____ miles	_____ miles

13. If you have ever traveled out of state to snowmobile, what was the primary reason?

- HAVE NEVER TRAVELED OUT OF STATE TO SNOWMOBILE
- BETTER SNOWMOBILE TERRAIN
- DIFFERENT SNOWMOBILE TERRAIN
- BETTER SNOWMOBILE FACILITIES
- BETTER SNOW CONDITIONS
- FRIENDS AND RELATIVES
- RACING AND COMPETITION
- CLUB TRIP

PLEASE LIST THE STATES YOU HAVE SNOWMOBILED IN: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

14. What is the typical length of your snowmobile outings?

- ONE DAY OUTINGS
- TWO DAYS OR MORE

15. What is the maximum distance you would transport your snowmobile for a one day outing?

\_\_\_\_\_ MILES

16. During a typical winter week how many hours do you spend snowmobiling if snow conditions are adequate?

\_\_\_\_\_ HOURS

17. Have you snowmobiled on any of the seven state snowmobile trails in North Dakota?

YES IF YES, PLEASE INDICATE WHICH OF THE FOLLOWING TRAILS YOU HAVE SNOWMOBILED ON:

- ROUGHRIDER TRAIL-MANDAN
- METIGOSHE TRAIL-BOTTINEAU
- SHEYENNE VALLEY TRAIL-VALLEY CITY
- RED RIVER VALLEY TRAIL-MANVEL
- CHARBONNEAU TRAIL-PICK CITY
- FORT RANSOM TRAIL-FORT RANSOM
- MOONLIGHTER TRAIL-MT. CARMEL

NO IF NO, WHY NOT?

- DISTANCE
- DID NOT KNOW ABOUT
- PREFER OTHER AREAS
- OTHER REASON: PLEASE SPECIFY \_\_\_\_\_

18. How long would you like a snowmobile trail to be?

\_\_\_\_\_ MILES

19. Please rank the following facilities which you believe are necessary for snowmobiling areas or trails according to your preference. Indicate with a 1--the choice most preferred, 2--for the next, etc. for all the choices.

- \_\_\_\_\_ TOILET FACILITIES
- \_\_\_\_\_ PARKING
- \_\_\_\_\_ TRASH BARRELS
- \_\_\_\_\_ TELEPHONES
- \_\_\_\_\_ FIREPLACES WITH FIREWOOD
- \_\_\_\_\_ TRAIL HEAD INFORMATION CENTER
- \_\_\_\_\_ WARMING SHELTER
- \_\_\_\_\_ OTHER: PLEASE SPECIFY \_\_\_\_\_

20. Please select from the following hazards for snowmobilers in North Dakota the three you feel are most serious.

- |                                   |                                 |
|-----------------------------------|---------------------------------|
| _____ RUNNING STREAMS             | _____ GUY WIRES, UTILITY POLES  |
| _____ DROP OFFS                   | _____ FENCES                    |
| _____ THIN ICE                    | _____ BURIED OBJECTS            |
| _____ ICE BUCKLES ON LAKES        | _____ CULVERTS AND MARKER POSTS |
| _____ LOW VISIBILITY              | _____ ROAD CROSSINGS            |
| _____ ROCKS                       | _____ RAILROAD CROSSINGS        |
| _____ LOW BEAMED BRIDGES          | _____ OTHER MOTORIZED VEHICLES  |
| _____ OTHER: PLEASE SPECIFY _____ |                                 |

21. Were you aware before this survey that \$6 of the \$8 you pay every two years to register your snowmobile in North Dakota is placed in a special fund for development and maintenance of snowmobile trails?

- \_\_\_\_\_ YES
- \_\_\_\_\_ NO

22. Please rank the following choices for how you feel this snowmobile trail money should be used. Indicate with a 1--the most important item, 2--for the next most important, to 10--the least important.

- \_\_\_\_\_ GROOMING TRAILS
- \_\_\_\_\_ MARKING TRAILS
- \_\_\_\_\_ LEASING AREAS OR TRAILS
- \_\_\_\_\_ SUPPORT FACILITIES (SHELTERS, PARKING, ETC.)
- \_\_\_\_\_ YOUTH SAFETY TRAINING
- \_\_\_\_\_ ADULT SAFETY TRAINING
- \_\_\_\_\_ ENFORCEMENT OF SNOWMOBILE LAWS
- \_\_\_\_\_ PRINTING AND DISTRIBUTION OF SNOWMOBILE INFORMATION AND MAPS
- \_\_\_\_\_ EXPANSION OF EXISTING TRAILS
- \_\_\_\_\_ OTHER: PLEASE SPECIFY \_\_\_\_\_

23. What changes or improvements would you like to see in public snowmobile trails in North Dakota?

24. How much would you typically spend for each of the following items?

	<u>A ONE DAY SNOWMOBILE OUTING</u>	<u>A TWO DAY SNOWMOBILE OUTING</u>	<u>SEASON</u>
FOOD AND BEVERAGES	_____	_____	XXXX
LODGING	XXXX	_____	XXXX
SNOWMOBILE FUEL	_____	_____	XXXX
ENTRANCE FEES	_____	_____	XXXX
SNOWMOBILING CLOTHING	XXXX	XXXX	_____
REPAIRS	XXXX	XXXX	_____

25. What is your home county? \_\_\_\_\_

26. What type of area do you live in?

- \_\_\_\_\_ TOWN OR CITY
- \_\_\_\_\_ RURAL NONFARM
- \_\_\_\_\_ FARM OR RANCH

27. What is your present occupation? \_\_\_\_\_

28. What is your sex?

- \_\_\_\_\_ MALE
- \_\_\_\_\_ FEMALE



29. What is the highest level of education that you have completed?

- LESS THAN 8 YEARS
- FROM 8 TO 11 YEARS
- HIGH SCHOOL GRADUATE
- SOME COLLEGE OR VOCATIONAL SCHOOL
- COLLEGE GRADUATE
- SOME GRADUATE SCHOOL
- GRADUATE DEGREE

30. Do you feel enforcement of snowmobile registration is adequate in North Dakota?

- YES
- NO

31. Do you own any three-wheeled recreational vehicles?

- YES IF YES, MAKE SIZE YEAR  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- NO

32. Do you feel three-wheelers should be licensed in North Dakota?

- YES IF YES, WHY? \_\_\_\_\_
- NO IF NO, WHY? \_\_\_\_\_

33. Have you had any unusually pleasant or unpleasant experiences while snowmobiling in North Dakota the past two winters?

34. Do you plan to continue snowmobiling for at least the next several years?

- YES
- NO IF NO, WHAT ARE YOUR PLANS? \_\_\_\_\_

APPENDIX B: DATA TABLES

APPENDIX TABLE B1. COUNTY OF RESIDENCE OF RESIDENT SNOWMOBILE OWNERS IN NORTH DAKOTA, 1973 AND 1983

County	Urban/ Rural <sup>a</sup>	1983 Percent of Registered Snowmobile Owners	1980 Percent of State Population	1973 Percent of Registered Snowmobile Owners <sup>b</sup>	1970 Percent of State Population
Cass	U	14.5	13.5	12.6	11.9
Grand Forks	U	6.6	10.1	7.1	9.9
Ward	U	6.5	8.9	9.7	9.5
Richland	U	5.9	2.9	3.5	2.9
Barnes	U	4.6	2.1	3.5	2.4
Stutsman	U	4.1	3.7	2.6	3.8
Burleigh	U	4.0	8.4	3.6	6.6
Pembina	R	2.9	1.6	4.0	1.7
Walsh	U	2.9	2.3	2.8	2.6
McLean	R	2.8	1.9	2.2	1.8
Bottineau	U	2.7	1.4	4.4	1.5
Morton	U	2.6	3.9	2.1	3.3
Traill	R	2.5	1.5	2.1	1.5
McHenry	R	2.4	1.2	2.5	1.5
Stark	U	2.4	3.6	1.6	3.2
Cavalier	R	2.2	1.2	2.8	1.3
Towner	R	2.0	0.6	1.4	0.6
Williams	U	1.9	3.4	3.7	3.1
Dickey	R	1.8	1.1	1.0	1.1
Mercer	U	1.6	1.4	1.2	1.0
Wells	U	1.6	1.1	0.8	1.3
Pierce	U	1.4	0.9	1.1	1.0
Mountrail	R	1.3	1.2	1.7	1.4
LaMoure	R	1.2	1.0	0.6	1.2
Ransom	R	1.2	1.0	0.4	1.1
Renville	R	1.2	0.6	1.4	0.6
Hettinger	R	1.1	0.7	0.5	0.8
Logan	R	1.1	0.5	0.8	0.7

- continued -

APPENDIX TABLE B1. COUNTY OF RESIDENCE OF RESIDENT SNOWMOBILE OWNERS IN NORTH DAKOTA, 1973 AND 1983 (CONTINUED)

County	Urban/ Rural <sup>a</sup>	1983 Percent of Registered Snowmobile Owners	1980 Percent of State Population	1973 Percent of Registered Snowmobile Owners <sup>b</sup>	1970 Percent of State Population
Ramsey	U	1.1	2.0	2.5	2.1
Rolette	R	1.1	1.8	1.2	1.9
Nelson	R	1.0	0.8	0.8	0.9
Sargent	R	1.0	0.8	1.2	1.0
Emmons	R	0.9	0.9	0.8	1.2
Steele	R	0.9	0.5	0.8	0.6
Benson	R	0.8	1.2	1.0	1.3
Dunn	R	0.8	0.7	0.3	0.8
Griggs	R	0.7	0.6	1.6	0.7
Burke	R	0.6	0.6	1.2	0.8
McIntosh	R	0.6	0.7	0.6	0.9
Bowman	R	0.5	0.6	0.8	0.6
Grant	R	0.5	0.7	0.4	0.8
Kidder	R	0.5	0.6	0.4	0.7
McKenzie	R	0.5	1.1	0.7	1.0
Foster	U	0.4	0.7	0.8	0.8
Divide	R	0.3	0.5	0.9	0.7
Eddy	R	0.3	0.5	0.3	0.7
Golden Valley	R	0.3	0.4	0.3	0.4
Oliver	R	0.3	0.4	0.5	0.4
Sheridan	R	0.3	0.4	0.6	0.5
Adams	R	0.1	0.5	0.1	0.6
Billings	R	0.1	0.2	0.1	0.2
Sioux	R	0.0	0.6	0.1	0.6
Slope	R	0.0	0.2	0.3	0.2
		100.0	100.0	100.0	100.0

<sup>a</sup>Any county with a place above 2,500 population was considered urban.  
<sup>b</sup>Thompson, 1974.

SOURCE: Survey of registered snowmobile owners, 1983 (question 25).

APPENDIX TABLE B2. OCCUPATIONS OF REGISTERED SNOWMOBILE OWNERS IN NORTH DAKOTA, 1973 AND 1983

Occupation	1983	1973 <sup>a</sup>
Farming/Ranching	34.9	31.3
Labor	9.3	1.0
Maintenance	7.7	0.9
Retired	7.7	8.4
Business/Self-Employed	6.1	
Sales	5.2	
Mechanic	4.6	
Manager	4.5	
Construction	3.6	
Government	3.5	12.3
Education	3.4	
Electronics	1.9	
Medical	1.8	
Housewife	1.7	
Service	1.6	
Craftsman	1.5	
Student	1.4	3.8
Technician	1.4	
Engineer	1.3	0.7
Police Officer	0.6	
Banking	0.5	
Accountant	0.4	
Military	0.4	
Professional	0.4	
Clerical	0.3	
Lawyer/Judge	0.3	
Unemployed	0.3	
Fireman	0.2	
Geologist	0.2	
Manufacturing	0.2	2.8
Minister	0.2	
All Others <sup>b</sup>	0.0	38.8
TOTALS	100.0	100.0

<sup>a</sup>Thompson, 1974.

<sup>b</sup>Thompson used somewhat different occupation groups.

SOURCE: Survey of registered snowmobile owners, 1983.

Literature Cited

- Adams, Dorothy. 1983. Personal communication. Recreation Planner.  
Bismarck: North Dakota State Parks and Recreation Department.
- Bureau of Planning. 1970. Minnesota Snowmobile Survey. St. Paul: Minnesota  
Department of Conservation.
- McAloon, William N. 1975. Snowmobiling: An Attitude Assessment of Montana  
Snowmobile Clubs. Missoula: University of Montana, Department of  
Health, Physical Education, and Recreation. 100 pages.
- Reain, Bruce S. 1973. User Preferences--Criteria for the Development of  
Future Snowmobile Areas. Waterloo, Ontario: Waterloo Lutheran  
University, Department of Geography. 172 pages.
- Sanderson, David. 1983. "Three-Wheelers." The Recreational Trailbike  
Planner 2(8):1,3.
- Schnaser, G., ed. 1971. A Continuing Market Analysis of Snowmobile Owners,  
1971 Research Report. Snow Gali, St. Paul, Minnesota, n.p.
- Smith, Emmett H. 1976. A Perspective of Snowmobile Owners in the Province of  
Alberta. College Station: Texas A&M University, Department of  
Recreation and Parks. 267 pages.
- Thompson, Karen F. 1974. A Survey of Snowmobile Use in North Dakota.  
Bismarck: North Dakota State Outdoor Recreation Agency. 39 pages.
- U.S. Bureau of the Census. 1980. North Dakota Census of Population 1980.  
Washington, D.C.: U.S. Government Printing Office.

