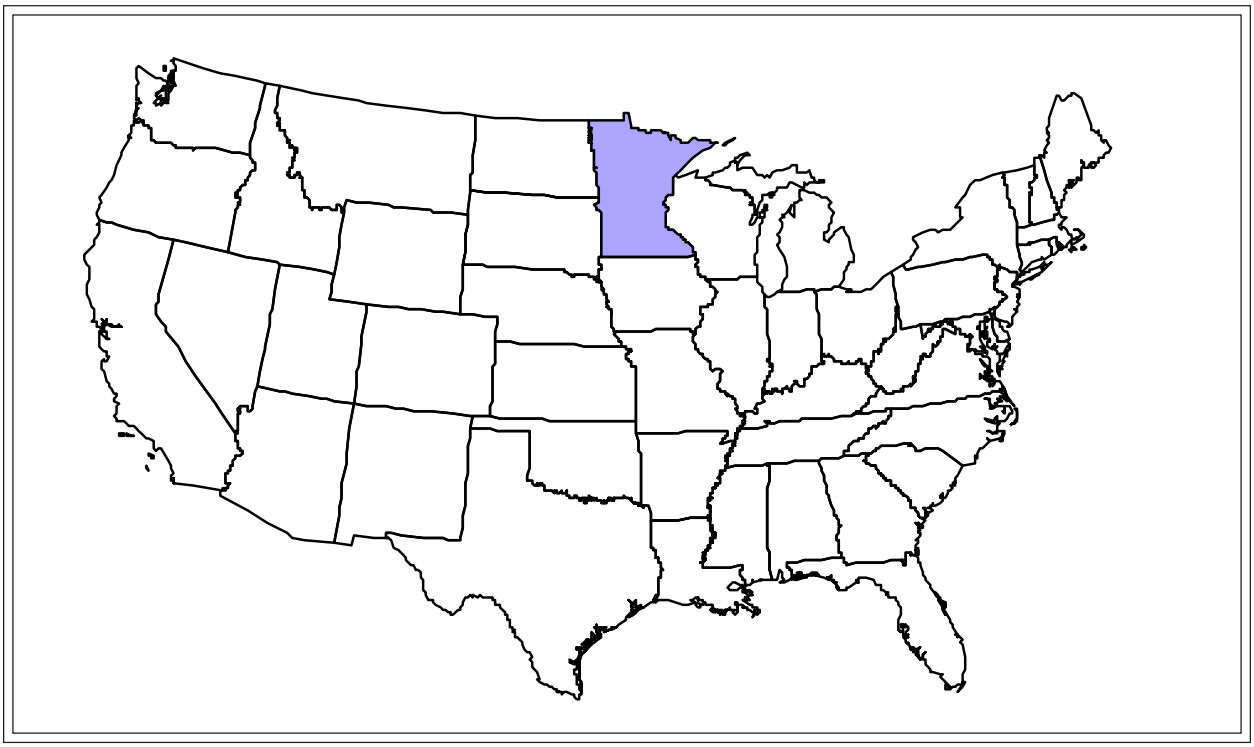
Ten-year forecasts of Minnesota adult outdoor recreation participation, 2004 to 2014

TEN-YEAR FORECASTS OF MINNESOTA ADULT OUTDOOR RECREATION PARTICIPATION, 2004 TO 2014



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SUMMARY

INTRODUCTION

The most recent State Comprehensive Outdoor Recreation Plan identified the need to better understand the changing nature of outdoor recreation in Minnesota. To meet this need, four efforts were originally planned. The first three of these are now complete, while the fourth will commence once funding is certain:

- determine the outdoor recreation patterns of adult Minnesotans.
- analyze existing information sources to determine recent trends in recreation participation (e.g., trends in fishing licenses); these analyses will assist with short-term forecasting.
- determine—from local-government recreation providers—the recreation facility and management needs of cities, counties and school districts in the state.
- determine the recreation facility and program needs of the general Minnesota population directly from that population.

For all of these efforts, the intent is to design a cost-effective methodology that can be repeated every five years. Repetitions of the efforts will monitor the changing nature of outdoor recreation in Minnesota, and will create trend information that can be analyzed and applied in short-term recreation forecasting. At this time, however, only the first iteration of the efforts exists, and, thus, the "intended" method for assessing trends and making short-term forecasts cannot be completed for a number of years.

In the meantime, demands exist for short-term forecasts of recreation participation. The purpose of this document is to address the demand for short-term forecasts in the years prior to the next iteration of the preceding efforts. The document provides statewide ten-year forecasts of the outdoor recreation participation patterns of adult Minnesotans. The forecasts are based on extrapolations of available recreation activity trend information and population projections.

The available information on recreation activity trends is of mixed quality, and this will be directly reflected in the quality of the results. The results are graded in terms of quality as they are presented. The results should be understood to represent a "best shot" at short-term forecasts using readily available information. There are numerous assumptions that need to be made to perform the forecasts. General conclusions from the results are considered tentative.

This summary is organized as follows:

- The first section describes the activity trend information and short-term forecasts. Included are discussions of information sources, analysis procedures, and results.

- The next section presents the historical context for the short-term forecast results. Many of the short-term activity forecasts—based on recent trends—point to decreasing recreation participation. This would not always have been the conclusion reached in the past.

Funding for all of these efforts is from the Land and Water Conservation Fund, as allocated by the Legislative Commission on Minnesota Resources.

ACTIVITY TREND INFORMATION AND SHORT-TERM FORECASTS

Information sources and analysis procedures

The method used to forecast recreation is based on extrapolation of recent trends into the near future. "Recent trends" are over the last ten years (or some period close to that) and the "near future" is the next ten years. Each activity is done separately.

For each activity, a measure of the recent trend was identified. The trend measures fall into four categories: A—measures based on Minnesota-specific activity trend data; B—measures based on U.S. trend data closely related to target activity; C—measures based on U.S. trend data somewhat related to target activity; and D—no trend measures could be found, so short-term forecasts are not made (see Table S-1). Category B and C measures are taken from the National Sporting Goods Association (NSGA) annual survey of some 10,000 U.S. households.

When this study commenced, the plan was to have the category A activities as they are here, but to have the category B, C and D activities come from a different data source. That different data source was the National Survey of Recreation and the Environment (NSRE). Unfortunately, the NSRE data proved unreliable in two important tests that are available to evaluate recreation survey quality; the two tests pertain to the ability to describe national hunting and fishing participation trends. The NSRE trends compared so poorly with the reliable hunting and fishing trend information that this study concluded that it could not justify using NSRE for *any* activity trends.

To use the NSGA data for Minnesota, many assumptions are made. Given all these assumptions, and the inability to offer evidence as to the general reasonableness of some of the assumptions, the approach here is to clearly label the source of the results, and ensure that all results are understood as "tentative". Even given their tentative nature, however, the results provide some valuable insights into the changing nature of outdoor recreation in Minnesota.

Short-term forecasts

Using the preceding methods and information sources, ten-year forecasts were made for the activities for which trend information was available. These forecast activities cover the bulk of adult Minnesotans annual outdoor recreation time in 2004 (83% of total recreation time). Those activities with Minnesota-specific trend information cover just over one-third of total recreation time.

Most activities have decreasing activity participation rates in the ten-year projections (see first set of columns in Table S-1). In the category A activities, which are based on Minnesota-specific trend data, all of the activities have decreases in participation rates between 11 and 25 percent, except offroad ATV driving. ATV driving has an exceptionally large increase, due to the rapid rate at which this activity has grown in the last ten years. Over these last ten years, ATV recreational vehicle registrations have about doubled every five years. Extrapolating this over the next ten years creates a huge increase, an increase that may or may not be realized. ATV registrations need to be closely monitored on a yearly basis to see if this rapid rate of growth continues.

Table S-1

Ten-year projections of annual outdoor recreation participation by Minnesotans, 2004 to 2014

(population 20 years old and older participating in Minnesota and elsewhere; the 2004 estimates are derived from expanding the 2004 survey sample by the 2000 U.S. Census counts for MN, and the 2014 estimates by the 2010 population projections for MN; the projected population rise is 15% over the 10-year period)

		Percent of population participating annually			*Number of annual participants (000's)*			*Number of annual hours of participation (000's)*		
Category	Activity	2004	2014	Change	2004	2014	Change	2004	2014	Change
A. Projections based on MN-specific activity trend data										
	Boating of all types, excluding fishing from a boat	35.5%	31.4%	-11.5%	1,237.3	1,258.9	1.8%	58,099.7	59,118.5	1.8%
	Fishing of all types	30.2%	24.7%	-18.4%	1,053.9	988.3	-6.2%	76,239.8	71,497.6	-6.2%
	Visiting outdoor zoos	27.5%	20.7%	-24.7%	956.6	828.1	-13.4%	5,822.6	5,040.9	-13.4%
	Visiting historic or archaeological sites	20.7%	16.2%	-21.6%	721.1	649.8	-9.9%	6,198.6	5,585.5	-9.9%
	Viewing, identifying or photographing birds and other wildlife	20.4%	15.9%	-22.0%	711.9	638.5	-10.3%	41,266.8	37,010.1	-10.3%
	Hunting of all types	16.0%	14.2%	-11.2%	556.0	567.8	2.1%	48,187.7	49,212.3	2.1%
	Offroad ATV driving	10.3%	36.1%	251.9%	357.3	1,446.0	304.7%	15,262.4	61,762.0	304.7%
	Snowmobiling	9.8%	8.2%	-16.8%	341.8	327.0	-4.3%	10,259.9	9,817.0	-4.3%
B. Projections based on U.S. trend data closely related to target activity										
	Biking (bicycling outdoors of all types, including mountain biking)	29.0%	17.8%	-38.5%	1,010.5	714.6	-29.3%	31,889.8	22,551.6	-29.3%
	Camping of all types	25.8%	29.9%	15.8%	898.5	1,196.1	33.1%	34,060.0	45,339.6	33.1%
	Golfing	23.5%	23.5%	0.0%	819.9	942.7	15.0%	37,063.2	42,615.8	15.0%
	Outdoor field sports (e.g., soccer, softball/baseball football)	21.1%	16.0%	-24.5%	736.6	639.3	-13.2%	21,185.3	18,388.2	-13.2%
	Inline skating, rollerblading, roller skating, roller skiing	11.3%	6.2%	-44.8%	393.8	250.1	-36.5%	11,384.3	7,228.5	-36.5%
	Downhill skiing/snowboarding	9.0%	9.0%	0.0%	313.4	360.3	15.0%	8,657.5	9,954.5	15.0%
	Cross country skiing	6.5%	3.2%	-51.4%	227.0	127.0	-44.1%	3,669.1	2,052.3	-44.1%
C. Projections based on U.S. trend data somewhat related to target activity										
	Walking/hiking (walking or hiking outdoors for exercise or pleasure)	54.4%	54.4%	0.0%	1,896.4	2,180.5	15.0%	129,654.7	149,078.8	15.0%
	Swimming or wading (all places)	40.8%	30.7%	-24.8%	1,422.7	1,230.4	-13.5%	53,475.5	46,247.8	-13.5%
	Outdoor court sports (e.g., volleyball, basketball tennis, horseshoes)	17.6%	12.0%	-31.6%	611.8	481.3	-21.3%	11,669.9	9,180.9	-21.3%
	Running or jogging	14.2%	15.2%	6.8%	496.5	609.6	22.8%	24,331.5	29,869.7	22.8%
	Ice skating/hockey outdoors	11.5%	6.8%	-40.9%	401.5	272.9	-32.0%	4,918.7	3,343.1	-32.0%
D. No projections due to lack of any trend data										
	Driving for pleasure on scenic roads or in a park	37.3%	---	---	1,300.0	---	---	33,472.8	---	---
	Picnicking	35.7%	---	---	1,245.3	---	---	35,914.0	---	---
	Visiting nature centers	25.4%	---	---	883.6	---	---	8,440.1	---	---
	Sledding and snow tubing	18.4%	---	---	642.1	---	---	4,998.7	---	---
	Viewing, identifying or photographing wildflowers, trees, natural vegetation	18.0%	---	---	628.9	---	---	35,988.8	---	---
	Gather mushrooms, berries, or other wild foods	8.7%	---	---	302.1	---	---	5,090.1	---	---
	Horseback riding	4.5%	---	---	157.1	---	---	2,567.3	---	---
	Snowshoeing	4.2%	---	---	146.2	---	---	974.3	---	---

For the category B and C activities, which are based on national trends, the projected participation rate changes are generally negative, much like the category A activities. Certain activities, however, are projected to have stable participation rates (golfing, downhill skiing/snowboarding, and walking/hiking), while a few have a projected increase in participation rates (camping and running/jogging).

These participation rate changes, when used in conjunction with population projections, provide forecasts of the number of activity participants (second set of columns in Table S-1). Further, since it is being assumed that added (and subtracted) activity participants are typical in terms of 2004 activity hours per year, the procedures provide forecasts of the number of annual hours of activity participation (last set of columns in Table S-1).

It is evident that projected population gains are offsetting many of the negative participation rate changes, and, thereby, producing more stable numbers of participants over the ten-year period. For example, hunting is forecast to have an 11 percent participation-rate decrease over the ten-year period, but the projected increase in the adult population of 15 percent produces a small gain in number of hunters and hunting hours (2% gain). If the population was not growing, the number of hunters and hunting hours would be projected to decrease at the same rate as the participation rate change (-11 percent).

This projected population gain is relatively rapid by Minnesota standards and—like any projection—it needs to be followed to see how well it tracks with actual population growth. The projections following the 2000 U.S. Census reflect the rapid increase in Minnesota's population during the 1990s, exceeded since World War II only by the baby-boom expansion of the 1950s .

The statewide projected population growth in Minnesota is expected to be unevenly distributed, just as it has been in the recent past. The pattern of population change will have a significant effect on recreation activity changes around the state. In the areas of the state that are growing rapidly, net increases in recreation use will likely result. The increases will be most evident in those areas with large numbers of new residents (population density change) coupled with large relative increase in population (percent change). These high population growth areas are the urban expansion regions of the state. Much of this expansion is focused on the greater Twin Cities metropolitan area, although other places are also expected to continue to grow rapidly.

In the aggregate, statewide outdoor recreation use in terms of hours of participation is projected to increase, if ATV riding is included, and to remain about the same as today, if ATV riding is excluded (see Table S-2). In other words, even with a relatively rapid population increase, overall outdoor recreation use for nearly all activities we can assess is stable; ATV riding is the exception. This conclusion applies to the category A activities by themselves, as well as to the A activities combined with the B and C activities. To a large extent, outdoor recreation use is projected to plateau in Minnesota.

On a per-capita basis, most projections are for decreases, meaning that the typical Minnesota adult will invest less time in outdoor recreation than in the past (Table S-2). The only exception is the category A activities with ATV riding included, which leads to no per-capita change.

Table S-2

Summary (by activity projection category) of ten-year projections of annual outdoor recreation hours by Minnesotans, 2004 to 2014

(population 20 years old and older participating in Minnesota and elsewhere; the 2004 estimates are derived from expanding the 2004 survey sample by the 2000 U.S. Census counts for MN, and the 2014 estimates by the 2010 population projections for MN; the projected population rise is 15% over the 10-year period)

	Annual hours (000's)			*Annual hours per capita*		
Projection categories included*	2004	2014	Percent change	2004	2014	Percent change
Including ATV driving:						
A	261,338	299,044	14%	75	75	0%
A+B	409,247	447,175	9%	117	112	-5%
A+B+C	633,297	684,895	8%	182	171	-6%
Excluding ATV driving:						
A	246,075	237,282	-4%	71	59	-16%
A+B	393,984	385,413	-2%	113	96	-15%
A+B+C	618,034	623,133	1%	177	156	-12%

*Activity projection categories:
A. Projections based on MN-specific activity trend data
B. Projections based on U.S. trend data closely related to target activity
C. Projections based on U.S. trend data somewhat related to target activity
D. No projections due to lack of any trend data

HISTORICAL CONTEXT FOR THE SHORT-TERM FORECAST RESULTS

Are these projections of decreasing per-capita use and plateauing total use at all realistic? The careful answer to this question—given the basis upon which the projections are made—is that these conclusions are tentative and will remain tentative until move evidence becomes available in the future. At this time, there are further pieces and parts of corroborating information that point in the direction of decreasing per-capita use. These pieces and parts add to the strength of the conclusions, but the conclusions still remain tentative.

The recently completed outdoor recreation survey of Minnesota adults examined the effect of broad demographic trends on shaping overall outdoor recreation use. For many of the demographic trends, the associated recreation trend is less overall use per capita. Take age as an example. In 2004, the pattern is one of decreasing recreation use as people age. And since the population is aging, the effect of the aging population is less overall use on a per-capita basis.

The conclusion to be drawn from these demographic trends is *not* that those demographic trends associated with less use per capita will in fact predominate over those associated with more use, and there are some of the latter. The conclusion to be drawn is that less overall use per capita should not be an unexpected outcome.

In addition, there is evidence at the national level for a generational shift in certain activities that leads to less activity involvement on a per-capita basis. The wildlife-related activities (fishing,

hunting, and wildlife-watching) all experienced decreasing overall participation rates in the 1990s, according to National Survey of Fishing, Hunting and Wildlife-Associated Outdoor Recreation. Within these overall decreases, the drops for the younger age groups are especially strong and exert a significant downward pull on overall population participation. The drop in the younger age classes was sufficient to shift the peak in participation out of the younger age classes into the next older age classes.

Whether these age-class patterns evident in the wildlife-related activities are applicable to other forms of outdoor recreation, and whether they are applicable in MN are seminal questions.

Based on assessments of historical records this study was able to assemble, decreasing per-capita recreation involvement has not always been the case at the national or Minnesota scale. In earlier time periods, increasing per-capita involvement was not unusual. Decreasing per-capita participation—especially the strong decreases—is of more recent vintage.

At the national scale, fishing participation was increasing faster than population in the 1955 to 1970 period, and hunting—although decreasing slightly—was just about maintaining a constant per-capita rate. In later time periods, both fishing and hunting had increasingly negative participation-rate changes.

In a similar historical sequence, both U.S. National Park and Minnesota State Park attendance per-capita increased in the 1980s, and decreased in the 1990s. Recent per-capita decreases in use are also evident for Twin Cities regional parks and trails. Although Twin Cities regional park and trail use has increased since 1998, population has increased even faster, which means less use per capita.

The final historical trend-series assessment comes from a place that is as far as you can get in a recreational sense from the Twin Cities metro area. It is from the Boundary Waters Canoe Area Wilderness (BWCAW), located along the Canadian border in northeastern Minnesota. The assessment shows a decreasing per-capita use trend for Minnesotans in recent years, preceded by an increase. This pattern of change is similar to that experienced by Minnesota State Parks.

Altogether, the historical BWCAW trend, plus the park and activity trends may be indicative of a diminishing desire of people for a wide variety of outdoor recreation pursuits. They may be indicative of the diminishing importance of outdoor recreation in the scheme of people's lives. Only time will tell whether this is true. Aspects of the American culture regularly experience phases of increasing and decreasing popularity. The outdoor recreation aspect of the culture should not be expected to be any different.

As part of the planned routine monitoring of the changing nature of recreation in Minnesota, one question monitors the general importance of outdoor recreation to adult Minnesotans: How important a part of your life is outdoor recreation? Responses to this question in 2004 show that a majority (57%) of adults believe outdoor recreation is a "very important" part of their life. Not surprisingly, the importance ascribed to recreation is closely connected to the amount of recreation participation. Future assessments of this question should prove most interesting.

INTRODUCTION

The most recent State Comprehensive Outdoor Recreation Plan identified the need to better understand the changing nature of outdoor recreation in Minnesota (Reference 1). To meet this need, four efforts were originally planned. The first three of these are now complete, while the fourth will commence once funding is certain:

- determine the outdoor recreation patterns of adult Minnesotans.
- analyze existing information sources to determine recent trends in recreation participation (e.g., trends in fishing licenses); these analyses will assist with short-term forecasting.
- determine—from local-government recreation providers—the recreation facility and management needs of cities, counties and school districts in the state.
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For all of these efforts, the intent is to design a cost-effective methodology that can be repeated every five years. Repetitions of the efforts will monitor the changing nature of outdoor recreation in Minnesota, and will create trend information that can be analyzed and applied in short-term recreation forecasting. At this time, however, only the first iteration of the efforts exists, and, thus, the "intended" method for assessing trends and making short-term forecasts cannot be completed for a number of years.

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This document is organized as follows:

- The first section describes the activity trend information and short-term forecasts. Included are discussions of information sources, analysis procedures, and results.

- The next section presents the historical context for the short-term forecast results. Many of the short-term activity forecasts—based on recent trends—point to decreasing recreation participation. This would not always have been the conclusion reached in the past.

Funding for all of these efforts is from the Land and Water Conservation Fund, as allocated by the Legislative Commission on Minnesota Resources.

The scoping and planning of the efforts was done by a work team, which continues to meet on an ad hoc basis as the efforts progress:

Current members:
Dorian Grilley, Parks & Trails Council of Minnesota
Tim Kelly, MN DNR
Emmett Mullin, MN DNR
Jon Nauman, Three Rivers Park District
Wayne Sames, MN DNR
Ron Sushak, MN DNR
Jonathan Vlaming, initially with the Metropolitan Council, presently with Three Rivers Park District

Past members:
John Schneider, Metropolitan State University
Colleen Tollefson, Office of Tourism

ACTIVITY TREND INFORMATION AND SHORT-TERM FORECASTS

Information sources and analysis procedures

The method used to forecast recreation is based on extrapolation of recent trends into the near future. "Recent trends" are over the last ten years (or some period close to that) and the "near future" is the next ten years. Each activity is done separately.

For each activity, a measure of the recent trend was identified (Table 1). The trend measures fall into four categories: A—measures based on Minnesota-specific activity trend data; B—measures based on U.S. trend data closely related to target activity; C—measures based on U.S. trend data somewhat related to target activity; and D—no trend measures could be found, so short-term forecasts are not made.

For the category A activities, Minnesota-specific measures come from the following sources (see Appendix A for more detail):

- Recreational boating, excluding fishing from a boat: measure from multiple Minnesota boating studies conducted by MN DNR and others.
- Fishing and hunting of all types: measures from Minnesota hunting and fishing licensing records from MN DNR
- Visiting outdoor zoos: measure from attendance records at the Minnesota and Duluth Zoo
- Visiting historic or archaeological sites: measure from attendance records at nine outdoor sites maintained by the Minnesota Historical Society
- Viewing, identifying or photographing birds and other wildlife: measure from the Minnesota data in the National Survey of Fishing, Hunting, and Wildlife-Associated Recreation, conducted by the USFWS and Census Bureau
- Offroad ATV driving: measure from recreational vehicle registration records of MN DNR.
- Snowmobiling: measure from recreational vehicle registration records of MN DNR.

When this study commenced, the plan was to have the category A activities as they are here, but to have the category B, C and D activities come from a different data source. That different data source was the National Survey of Recreation and the Environment (NSRE)(see Reference 2). NSRE had been done in 1994-95

Table 1

Sources of information on recent activity participation rate changes used in ten-year projections

("recent" is last 10 years)

Category	Activity	Source of information used to estimate activity trend
A. Estimates based on MN-specific activity trend data		
	Boating of all types, excluding fishing from a boat	Boating studies from MN DNR and MN-WI BAC
	Fishing of all types	MN DNR licensed anglers
	Visiting outdoor zoos	MN Zoo + Duluth Zoo attendance
	Visiting historic or archaeological sites	MHS attendance at nine outdoor sites
	Viewing, identifying or photographing birds and other wildlife	USFWS survey participation rate for MN wildlife watching
	Hunting of all types	MN DNR licensed hunters
	Offroad ATV driving	MN DNR registered ATVs
	Snowmobiling	MN DNR registered snowmobiles
B. Estimates based on U.S. trend data closely related to target activity		
	Biking (bicycling outdoors of all types, including mountain biking)	NSGA participation survey: Bicycle Riding
	Camping of all types	NSGA participation survey: Camping (vacation/overnite)
	Golfing	NSGA participation survey: Golf
	Outdoor field sports (e.g., soccer, softball/baseball football)	NSGA participation survey: Baseball + Football (tackle) + Football (touch) + Soccer + Softball
	Inline skating, rollerblading, roller skating, roller skiing	NSGA participation survey: Inline Roller Skating
	Downhill skiing/snowboarding	NSGA participation survey: Skiing (alpine) + Snowboarding
	Cross country skiing	NSGA participation survey: Skiing (cross country)
C. Estimates based on U.S. trend data somewhat related to target activity		
	Walking/hiking (walking or hiking outdoors for exercise or pleasure)	NSGA participation survey: Hiking + Exercise Walking (includes indoor and outdoor participants)
	Swimming or wading (all places)	NSGA participation survey: Swimming (includes indoor and outdoor participants)
	Outdoor court sports (e.g., volleyball, basketball tennis, horseshoes)	NSGA participation survey: Basketball + Tennis + Volleyball (includes indoor and outdoor participants)
	Running or jogging	NSGA participation survey: Running/Jogging (includes indoor and outdoor participants)
	Ice skating/hockey outdoors	NSGA participation survey: Ice/Figure Skating + Hockey (ice) (includes indoor and outdoor participants
D. No estimates due to lack of any trend data		
	Driving for pleasure on scenic roads or in a park	---
	Picnicking	---
	Visiting nature centers	---
	Sledding and snow tubing	---
	Viewing, identifying or photographing wildflowers, trees, natural vegetation	---
	Gather mushrooms, berries, or other wild foods	---
	Horseback riding	---
	Snowshoeing	---

and repeated in 2000-01, and trends from these two surveys were to be used for Minnesota activity trends. NSRE data were to be analyzed and the best available NSRE geographic representation of Minnesota was to be identified (e.g., multi-state region including Minnesota).

Unfortunately, the NSRE data proved unreliable in two important tests that are available to evaluate recreation survey quality. At a national level, trends in hunting and fishing participation are relatively well known from USFWS-compiled license sales information (Reference 3) and from the USFWS National Survey of Fishing, Hunting and Wildlife-Associated Recreation (Reference 4). The USFWS's license-sales trend and the National-Survey trend closely match each other and, together, provide a reliable guide to national fishing and hunting trends (Table 2). Both hunting and fishing fell from the mid 1990s to the early part of the current decade.

The NSRE trends for these two activities, however, are far different. NSRE has national fishing and hunting participation rising rapidly over this same period (Table 2). The NSRE trends compared so poorly with the reliable trend information that this study concluded that it could not justify using NSRE for *any* activity trends.

Table 2

Trend indicators for fishing and hunting, mid-1990s to early 2000s

FISHING

Year	*USFWS:* National survey (1996 to 2001)*	*USFWS:* National summation of state-licensed participants per capita (1996 to 2001)**	*NSRE:* National survey (1994-95 to 2000-01)***
mid-1990s (=100)	100	100	100
early 2000s	92	93	118

HUNTING

Year	*USFWS:* National survey (1996 to 2001)*	*USFWS:* National summation of state-licensed participants per capita (1996 to 2001)**	*NSRE:* National survey (1994-95 to 2000-01)***
mid-1990s (=100)	100	100	100
early 2000s	89	93	122

* Index based on participation rate of age 16+ population from USFWS National Survey of Fishing, Hunting and Wildlife-Associated Recreation.

** Index based on national summation of state-licensed participants, normalized by U.S. population age 16+, from USFWS license certification records.

*** Index based on participation rate of age 16+ population from National Survey of Recreation and the Environment (NSRE).

Note: All population figures are from the U.S. Census and are linearly interpolated between decennial census years; 2001 figure is an estimates from the U.S. Census Bureau.

Once NSRE was eliminated from consideration, two options were considered. The first was to just do the category A activities with Minnesota-specific data and ignore the rest. The second was to find and test another data source on activity trends. The other data source tested was one that is commonly used in the sports

and recreation area: National Sporting Goods Association (NSGA)(see Reference 5). NSGA conducts an annual sports/recreation participation survey of some 10,000 U.S. households.

The NSGA survey results were run through the same national fishing and hunting trend tests, and the survey fared better. The fishing trend was well captured by NSGA between 1991 and 2001 (Table 3). The hunting trend, however, was not that well captured. NSGA has hunting participation heading down over the 1991-2001 period, but the decrease is too small. The NSGA hunting trend data do not cover all types of hunting (only "firearms hunting"), but the types captured are the largest types of hunting.

Table 3

Trend indicators for fishing and hunting, 1991 to 2001

FISHING

Year	*USFWS:* National survey*	*USFWS:* National summation of state-licensed participants per capita**	*NSGA:* National survey***
1991 (=100)	100	100	100
1996	93	91	89
2001	86	85	84

HUNTING

Year	*USFWS:* National survey*	*USFWS:* National summation of state-licensed participants per capita**	*NSGA:* National survey (firearm hunters only)***
1991 (=100)	100	100	100
1996	94	90	92
2001	83	84	95

* Index based on participation rate of age 16+ population from USFWS National Survey of Fishing, Hunting and Wildlife-Associated Recreation.

** Index based on national summation of state-licensed participants, normalized by U.S. population age 16+, from USFWS license certification records.

*** Index based on NSGA annual participant survey, normalized by U.S. population age 7+. Figures are three-year averages (e.g., 1991 is an average of 1990, 1991 and 1992).

Note: All population figures are from the U.S. Census and are linearly interpolated between decennial census years; 2001-02 figures are estimates from the U.S. Census Bureau.

Since NSGA captured the fishing trend well, and the hunting trend at least partially, the decision was made to use NSGA in this study where it had applicability (for the category B and C activities). The NSGA data used here are the "free" information available at the national level for ages 7 and older.

To use the NSGA data for Minnesota, two assumptions are made: national trends from NSGA are reflected in Minnesota, and NSGA activity trends for ages 7+ are reflected in Minnesota age 20+ trends. It is known that national trends for hunting, fishing and wildlife watching have similarities at the national and Minnesota level (Table 4), but it is not known whether this is the case for the other

Table 4

Recent (1991 to 2001) trends in annual participation in wildlife-related recreation for U.S. and Minnesota

(population aged 16 and over; the population increase from 1991 to 2001 was 12% for U.S. and 14% for Minnesota)

Activity	----- *Percent of population participating* ----- 1991	2001	Percent change 1991 to 2001***
Fishing			
U.S.*	18.7%	16.0%	-14.3%
Minnesota**	38.5%	31.5%	-18.1%
Hunting			
U.S.*	7.4%	6.1%	-17.1%
Minnesota**	15.8%	14.5%	-7.8%
Away-from-home wildlife-watching (at least 1 mile from home)			
U.S.*	15.8%	10.3%	-34.9%
Minnesota*	23.6%	15.2%	-35.5%
Total wildlife-watching (includes activity within 1 mile of home and over 1 mile of home)			
U.S.*	40.1%	31.1%	-22.3%
Minnesota*	59.1%	54.0%	-8.5%

* Source: National Survey of Fishing, Hunting, and Wildlife-Associated Recreation (1991 and 2001). U.S. Department of Interior, Fish and Wildlife Service; and U.S. Department of Commerce, Census Bureau.

** Source: MN DNR and U. S. Bureau of the Census. The participation measure is the percent of the MN population aged 16+ who have a MN fishing or hunting license. The 1991 figure is an average of 1990 to 1992, and the 2001 figure is an average of 2000 to 2002.

*** For those based on the National Survey, all the changes are estimated to be statistically significant at the .05 level, except the MN "total wildlife watching" change, which is not statistically different from zero. Statistical significance is estimated from parameters published with the National Survey.

activities. Also, how the age differences affect the results is not known, except that most of the population over 7 years old is in the 20+ age group (nearly 80% of U.S. population aged 7+ is 20+ in 2000).

In addition, for the category C activities, the NSGA data are for activities that are regularly performed both outdoors and indoors, and the assumption is made that trends in the NSGA outdoor-indoor activity are the same as for the outdoor

component of the target activity in this study; the accuracy of this assumption is not known.

Given all these assumptions, and the inability to offer evidence as to the general reasonableness of some of the assumptions, the approach here is to clearly label the source of the results, and ensure that all results are understood as "tentative". Even given their tentative nature, however, the results provide some valuable insights into the changing nature of outdoor recreation in Minnesota.

After activity measures were identified, the following three-step general forecasting procedure was applied (see Appendix A for a detailed discussion of the data and procedures for each activity):

1. The measure of activity involvement over the most recent 10 years is normalized by the relevant population to derive a per-capita data series. The measure of activity involvement is either the number of participants, amount of use, or registered recreational vehicles. The relevant population may be age specific (e.g., age 16+ for fishing licenses), and may refer to the U.S. as a whole or Minnesota or a portion of Minnesota (e.g., seven-county Twin Cities metropolitan area).
2. A linear regression line is fit to the data series in #1, and the percent change along the regression line between the first and tenth year is computed. If the slope of the regression line is not statistically different from zero (which occurred in 3 of the 18 cases), the slope is set at zero (i.e., percent change is set to zero).
3. The percent change in #2 is assessed against the current (2004) percent of population participating in an activity to derive the percent participating 10 years later in 2014. The 2014 percent is then multiplied by the projected population 10 years later to get the number of participants. The number of participants is subsequently multiplied by the 2004 annual activity hours per participant value to compute 2014 activity hours. The assumption is made that added (and subtracted) activity participants are typical in terms of activity hours per year.

Steps 1 to 3 were done for all but two activities, whose measures were vehicle registration trends. One of these (Minnesota ATV registrations) was examined differently because it was expanding so rapidly. ATV registrations over the last 10 years were examined in three ways: (i) all of the 10 years, (ii) first 5 years, (iii) last 5 years. All three of these measures (as shown in Appendix A) are nearly the

same, so the entire ten-year trend was used. The other of these was Minnesota snowmobile registrations, which were rather erratic over the last 10 years, perhaps due—at least in part—to variable snow conditions. Snowmobile registrations were examined in the same way as ATV registrations: (i) all of the 10 years, (ii) first 5 years, (iii) last 5 years. The last 5 years differed materially from the first 5, so the last 5 were used to derive the trend for the projections (see Appendix A).

Short-term forecasts

Using the preceding methods and information sources, ten-year forecasts are made for the activities for which trend information was available. These forecast activities cover the bulk of adult Minnesotans annual outdoor recreation time in 2004 (83% of total recreation time—Table 5). Those activities with Minnesota-specific trend information cover just over one-third of total recreation time.

Table 5

Percent of 2004 recreation hours in activity projection categories

Projection category	Percent of hours
A. Projections based on MN-specific activity trend data	34.4%
B. Projections based on U.S. trend data closely related to target activity	19.4%
C. Projections based on U.S. trend data somewhat related to target activity	29.5%
D. No projections due to lack of any trend data	16.8%
Total	100.0%

Most activities have decreasing activity participation rates in the ten-year projections (see first set of columns in Table 6). In the category A activities, which are based on Minnesota-specific trend data, all of the activities have decreases in participation rates between 11 and 25 percent, except offroad ATV driving. ATV driving has an exceptionally large increase, due to the rapid rate at which this activity has grown in the last ten years. Over these last ten years, ATV recreational vehicle registrations have about doubled every five years. Extrapolating this over the next ten years creates a huge increase, an increase that may or may not be realized. ATV registrations need to be closely monitored on a yearly basis to see if this rapid rate of growth continues. [As an aside, ATV riding needs to be routinely monitored to see how, where, and

Table 6

Ten-year projections of annual outdoor recreation participation by Minnesotans, 2004 to 2014

(population 20 years old and older participating in Minnesota and elsewhere; the 2004 estimates are derived from expanding the 2004 survey sample by the 2000 U.S. Census counts for MN, and the 2014 estimates by the 2010 population projections for MN; the projected population rise is 15% over the 10-year period)

		Percent of population participating annually			*Number of annual participants (000's)*			*Number of annual hours of participation (000's)*		
Category	Activity	2004	2014	Change	2004	2014	Change	2004	2014	Change
A. Projections based on MN-specific activity trend data										
	Boating of all types, excluding fishing from a boat	35.5%	31.4%	-11.5%	1,237.3	1,258.9	1.8%	58,099.7	59,118.5	1.8%
	Fishing of all types	30.2%	24.7%	-18.4%	1,053.9	988.3	-6.2%	76,239.8	71,497.6	-6.2%
	Visiting outdoor zoos	27.5%	20.7%	-24.7%	956.6	828.1	-13.4%	5,822.6	5,040.9	-13.4%
	Visiting historic or archaeological sites	20.7%	16.2%	-21.6%	721.1	649.8	-9.9%	6,198.6	5,585.5	-9.9%
	Viewing, identifying or photographing birds and other wildlife	20.4%	15.9%	-22.0%	711.9	638.5	-10.3%	41,266.8	37,010.1	-10.3%
	Hunting of all types	16.0%	14.2%	-11.2%	556.0	567.8	2.1%	48,187.7	49,212.3	2.1%
	Offroad ATV driving	10.3%	36.1%	251.9%	357.3	1,446.0	304.7%	15,262.4	61,762.0	304.7%
	Snowmobiling	9.8%	8.2%	-16.8%	341.8	327.0	-4.3%	10,259.9	9,817.0	-4.3%
B. Projections based on U.S. trend data closely related to target activity										
	Biking (bicycling outdoors of all types, including mountain biking)	29.0%	17.8%	-38.5%	1,010.5	714.6	-29.3%	31,889.8	22,551.6	-29.3%
	Camping of all types	25.8%	29.9%	15.8%	898.5	1,196.1	33.1%	34,060.0	45,339.6	33.1%
	Golfing	23.5%	23.5%	0.0%	819.9	942.7	15.0%	37,063.2	42,615.8	15.0%
	Outdoor field sports (e.g., soccer, softball/baseball football)	21.1%	16.0%	-24.5%	736.6	639.3	-13.2%	21,185.3	18,388.2	-13.2%
	Inline skating, rollerblading, roller skating, roller skiing	11.3%	6.2%	-44.8%	393.8	250.1	-36.5%	11,384.3	7,228.5	-36.5%
	Downhill skiing/snowboarding	9.0%	9.0%	0.0%	313.4	360.3	15.0%	8,657.5	9,954.5	15.0%
	Cross country skiing	6.5%	3.2%	-51.4%	227.0	127.0	-44.1%	3,669.1	2,052.3	-44.1%
C. Projections based on U.S. trend data somewhat related to target activity										
	Walking/hiking (walking or hiking outdoors for exercise or pleasure)	54.4%	54.4%	0.0%	1,896.4	2,180.5	15.0%	129,654.7	149,078.8	15.0%
	Swimming or wading (all places)	40.8%	30.7%	-24.8%	1,422.7	1,230.4	-13.5%	53,475.5	46,247.8	-13.5%
	Outdoor court sports (e.g., volleyball, basketball tennis, horseshoes)	17.6%	12.0%	-31.6%	611.8	481.3	-21.3%	11,669.9	9,180.9	-21.3%
	Running or jogging	14.2%	15.2%	6.8%	496.5	609.6	22.8%	24,331.5	29,869.7	22.8%
	Ice skating/hockey outdoors	11.5%	6.8%	-40.9%	401.5	272.9	-32.0%	4,918.7	3,343.1	-32.0%
D. No projections due to lack of any trend data										
	Driving for pleasure on scenic roads or in a park	37.3%	---	---	1,300.0	---	---	33,472.8	---	---
	Picnicking	35.7%	---	---	1,245.3	---	---	35,914.0	---	---
	Visiting nature centers	25.4%	---	---	883.6	---	---	8,440.1	---	---
	Sledding and snow tubing	18.4%	---	---	642.1	---	---	4,998.7	---	---
	Viewing, identifying or photographing wildflowers, trees, natural vegetation	18.0%	---	---	628.9	---	---	35,988.8	---	---
	Gather mushrooms, berries, or other wild foods	8.7%	---	---	302.1	---	---	5,090.1	---	---
	Horseback riding	4.5%	---	---	157.1	---	---	2,567.3	---	---
	Snowshoeing	4.2%	---	---	146.2	---	---	974.3	---	---

by whom these machines are being used. The activity is growing so fast that new patterns of use may be emerging that could quickly dominate the overall activity in a matter of years.]

For the category B and C activities, which are based on national trends, the projected participation rate changes are generally negative, much like the category A activities. Certain activities, however, are projected to have stable participation rates (golfing, downhill skiing/snowboarding, and walking/hiking), while a few have a projected increase in participation rates (camping and running/jogging).

These participation rate changes, when used in conjunction with population projections, provide forecasts of the number of activity participants (second set of columns in Table 6). Further, since it is being assumed that added (and subtracted) activity participants are typical in terms of 2004 activity hours per year, the procedures provide forecasts of the number of annual hours of activity participation (last set of columns in Table 6).

It is evident in Table 6 that projected population gains are offsetting many of the negative participation rate changes, and, thereby, producing more stable numbers of participants over the ten-year period. For example, hunting is forecast to have an 11 percent participation-rate decrease over the ten-year period, but the projected increase in the adult population of 15 percent produces a small gain in number of hunters and hunting hours (2% gain). If the population was not growing, the number of hunters and hunting hours would be projected to decrease at the same rate as the participation rate change (-11 percent).

This projected population gain is relatively rapid by Minnesota standards and—like any projection—it needs to be followed to see how well it tracks with actual population growth (Reference 6). The projections following the 2000 U.S. Census reflect the rapid increase in Minnesota's population during the 1990s, exceeded since World War II only by the baby-boom expansion of the 1950s (Reference 7)(see Figure 1). Before the full extent of the 1990s population growth was realized, the projections (from 1998) were considerably lower. In both the 1998 and 2002 population projections, the rate of growth decreases over time, which means that the damping effect on any participation-rate decreases would be less in the future.

The statewide projected population growth in Minnesota is expected to be unevenly distributed, just as it has been in the recent past (Figure 2). The pattern

Figure 1

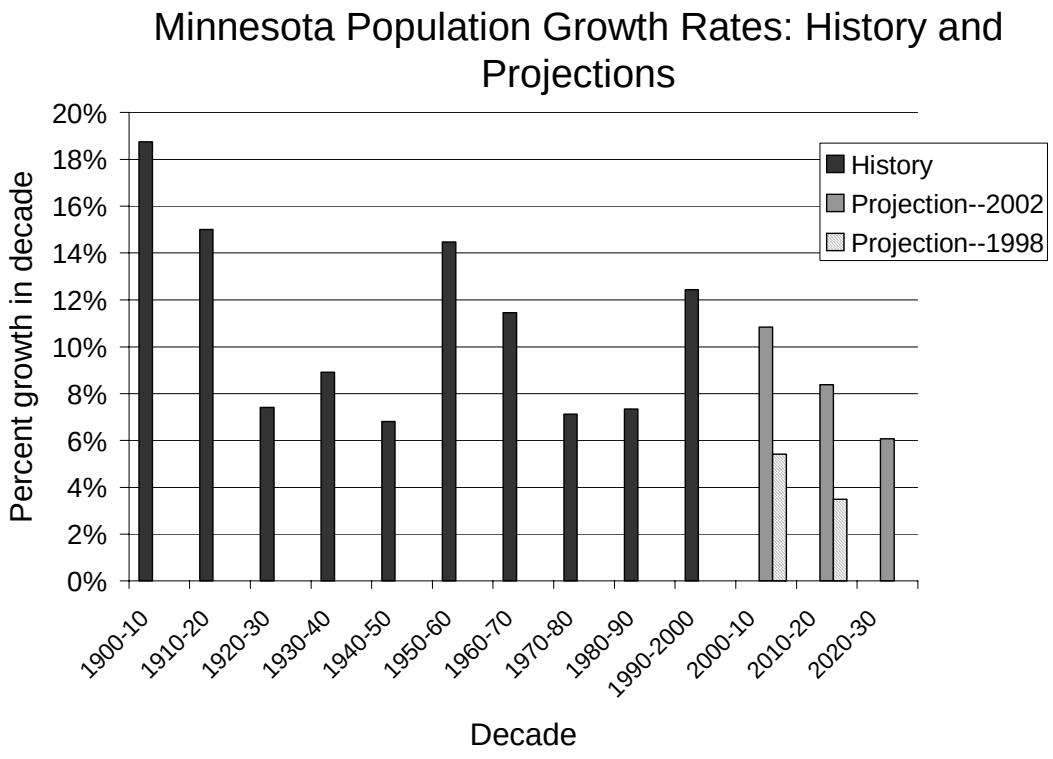
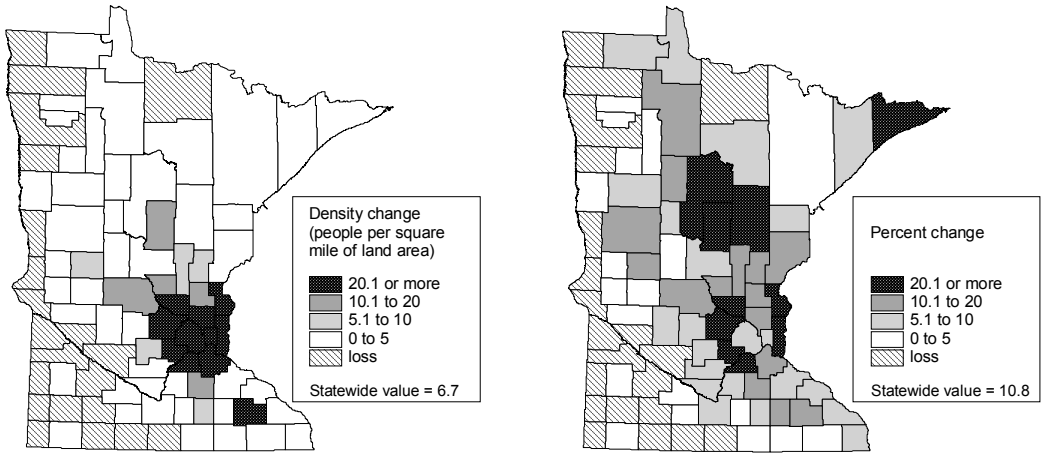


Figure 2

Population projections for Minnesota counties, 2000 to 2010*



* Source: Minnesota Department of Administration, Minnesota Planning, State Demographic Center. 2002. Minnesota Population Projections 2000 - 2030.

of population change will have a significant effect on recreation activity changes around the state. This study does not have activity-trend information below the state level to make sub-state recreation projections, but a few observations based on population growth patterns are worth noting. In the future, when the base recreation studies are repeated on a regular five-year basis as planned, sub-state projections will be possible.

In the areas of the state that are growing rapidly, net increases in recreation use will likely result. The increases will be most evident in those areas with large numbers of new residents (density change on Figure 2) coupled with large relative increases in population (percent change on Figure 2). These high population growth areas are the urban expansion regions of the state. Much of this expansion is focused on the greater Twin Cities metropolitan area, although other places are also expected to grow rapidly (e.g., Olmsted County in southeastern Minnesota).

In the aggregate, statewide outdoor recreation use in terms of hours of participation is projected to increase, if ATV riding is included, and to remain about the same as today, if ATV riding is excluded (Table 7). In other words, even with a relatively rapid population increase, overall outdoor recreation use for

Table 7

Summary (by activity projection category) of ten-year projections of annual outdoor recreation hours by Minnesotans, 2004 to 2014

(population 20 years old and older participating in Minnesota and elsewhere; the 2004 estimates are derived from expanding the 2004 survey sample by the 2000 U.S. Census counts for MN, and the 2014 estimates by the 2010 population projections for MN; the projected population rise is 15% over the 10-year period)

	Annual hours (000's)			*Annual hours per capita*		
Projection categories included*	2004	2014	Percent change	2004	2014	Percent change
Including ATV driving:						
A	261,338	299,044	14%	75	75	0%
A+B	409,247	447,175	9%	117	112	-5%
A+B+C	633,297	684,895	8%	182	171	-6%
Excluding ATV driving:						
A	246,075	237,282	-4%	71	59	-16%
A+B	393,984	385,413	-2%	113	96	-15%
A+B+C	618,034	623,133	1%	177	156	-12%

*Activity projection categories:
A. Projections based on MN-specific activity trend data
B. Projections based on U.S. trend data closely related to target activity
C. Projections based on U.S. trend data somewhat related to target activity
D. No projections due to lack of any trend data

nearly all activities we can assess is stable; ATV riding is the exception. This conclusion applies to the category A activities by themselves, as well as to the A activities combined with the B and C activities. To a large extent, outdoor recreation use is projected to plateau in Minnesota.

On a per-capita basis, most projections are for decreases, meaning that the typical Minnesota adult will invest less time in outdoor recreation than in the past (Table 7). The only exception is the category A activities with ATV riding included, which leads to no per-capita change.

HISTORICAL CONTEXT FOR THE SHORT-TERM FORECAST RESULTS

Are these projections of decreasing per-capita use and plateauing total use at all realistic? The careful answer to this question—given the basis upon which the projections are made—is that these conclusions are tentative, and will remain tentative until move evidence becomes available down the road. At this time, there are further pieces and parts of corroborating information that point in the direction of decreasing per-capita use. These pieces and parts add to the strength of the conclusions, but the conclusions still remain tentative.

The recently completed outdoor recreation survey of Minnesota adults examined the effect of broad demographic trends on shaping overall outdoor recreation use (Reference 8)(see Table 8). For many of the demographic trends, the associated recreation trend is less overall use per capita. Take age as an example. In 2004, the pattern is one of decreasing recreation use as people age (Figure 3). And since the population is aging (Figure 4), the effect of the aging population is less overall use on a per-capita basis.

The conclusion to be drawn from these demographic trends is *not* that those demographic trends associated with less use per capita will in fact predominate over those associated with more use, and there are some of the latter (Table 8). The conclusion to be drawn is that less overall use per capita should not be an unexpected outcome.

In addition, there is evidence at the national level for a generational shift in certain activities that leads to less activity involvement on a per-capita basis (Figure 5). The wildlife-related activities (fishing, hunting, and wildlife-watching) all

Table 8

Summary table: Recreation use trends associated with demographic characteristics and trends

Associated recreation use trend	Demographic characteristic	Demographic trend
Less use		
Less overall use per capita	Population density of residence (urban-rural)	Increasing urban
Less overall use per capita	Region of Minnesota	Increasing metro area/urban
Less overall use per capita	Age class	Increasing age
Less overall use per capita	Race/ethnicity	More non-white and/or Hispanic
Less overall use per capita	Household size	Smaller sizes
No effect on use		
Neutral	Gender	Neutral
More use		
More overall use per capita	Education	More formal education
More overall use per capita	Household Income	Higher incomes

experienced decreasing overall participation rates in the 1990s, according to National Survey of Fishing, Hunting and Wildlife-Associated Outdoor Recreation (Reference 4). Within these overall decreases, the drops for the younger age groups are especially strong and exert a significant downward pull on overall population participation. The drop in the younger age classes was sufficient to shift the peak in participation out of the younger age classes into the next older age classes. [As an aside, Minnesota—through its Electronic Licensing System—can begin to develop detailed demographic trends on hunting and angling (e.g., age, gender, and geographic trends). ELS went into operation in 2001, and all information is archived.]

Whether these age-class patterns evident in the wildlife-related activities are generalizable to other forms of outdoor recreation, and whether they are applicable in Minnesota are seminal questions. In this regard, one speculative item is worth noting.

On the age-class pattern of overall recreation use in Minnesota (Figure 3), the increase in overall recreation use per capita with decreasing age—which in 2004 dropped down for the youngest adult age class—continued to rise into the youngest adult age class in the 1980s, the only other time this kind of work has been done in Minnesota (Reference 9). This pattern change—a shift of peak involvement from the younger to an older age group—is the same as noted above for wildlife-related activities at the national level. If the Minnesota pattern change

Figure 3

Index of outdoor recreation use (hours) by age class

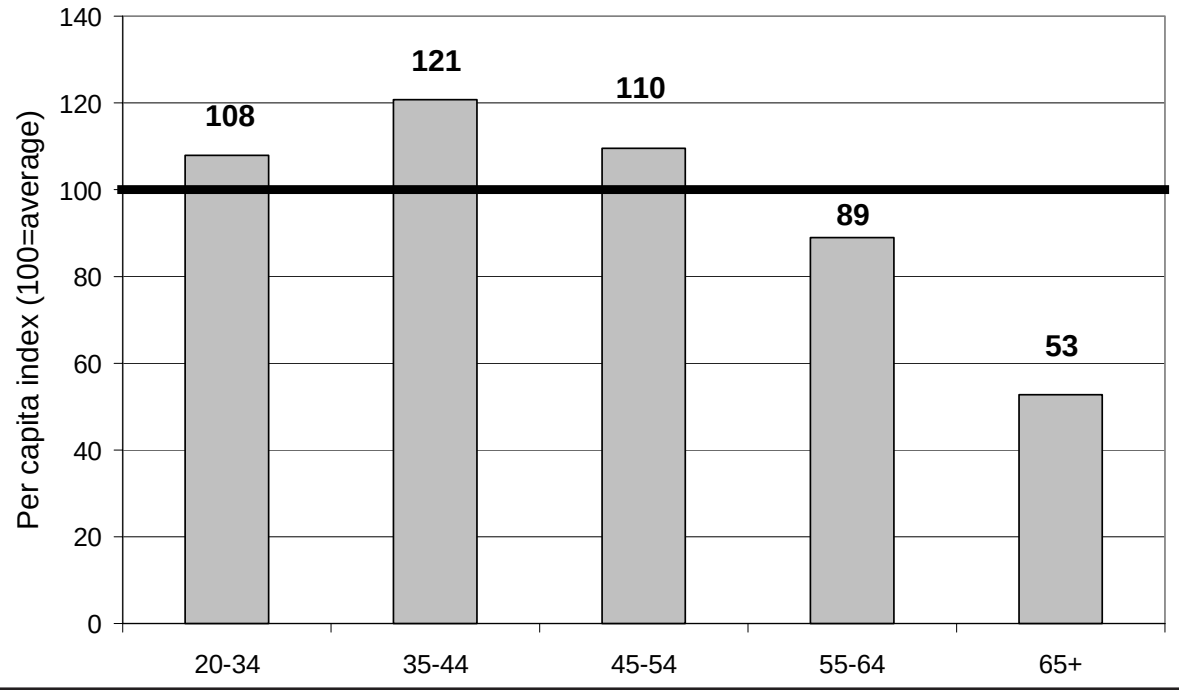


Figure 4

Trends in Minnesota median age

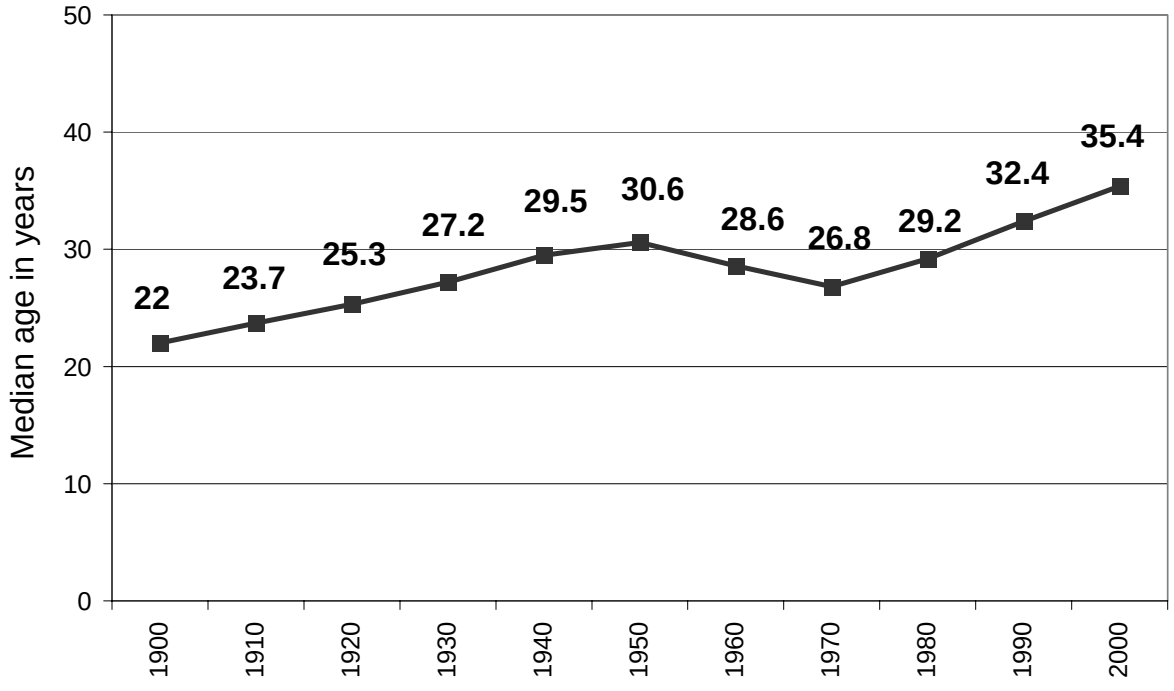
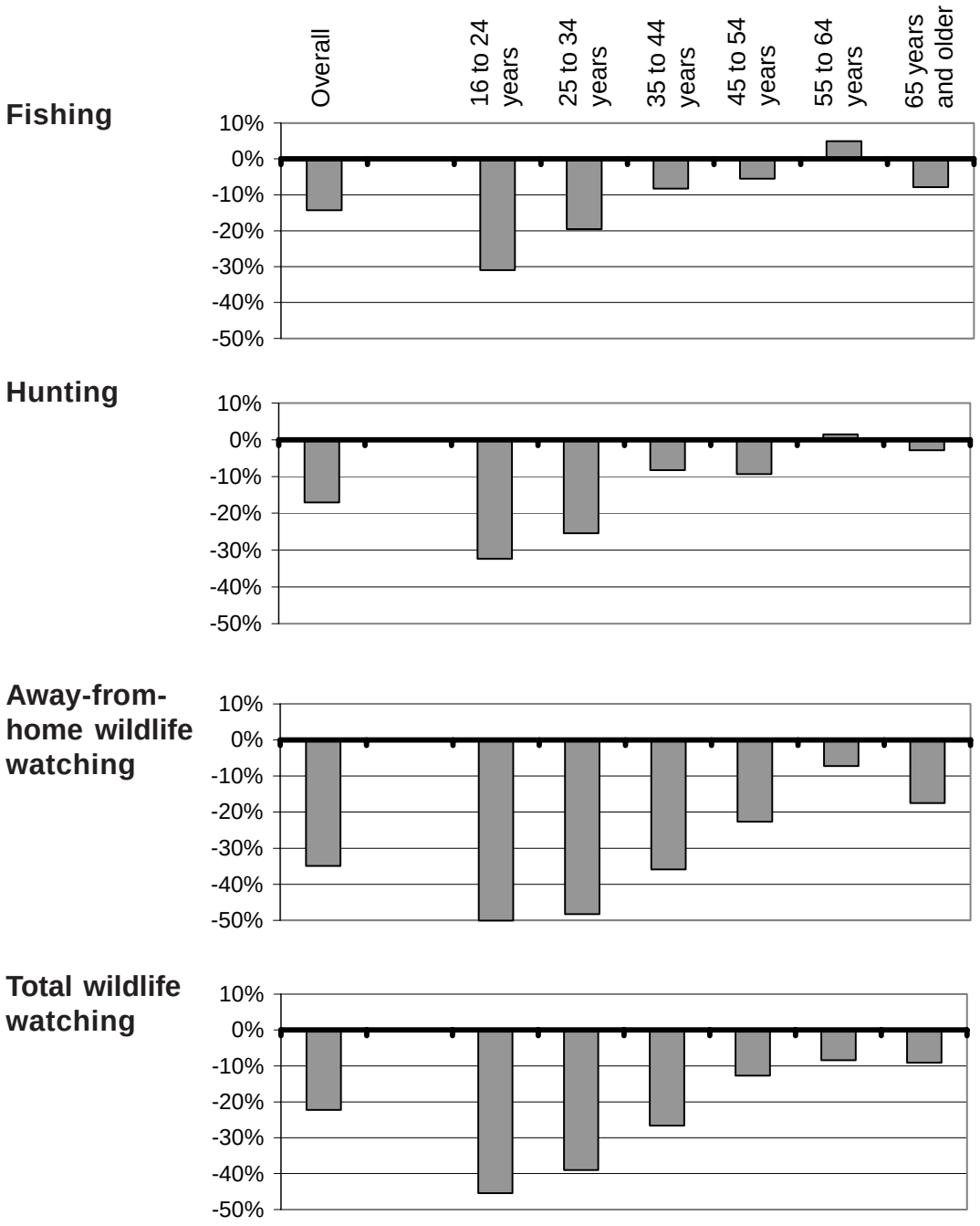


Figure 5

Participation rate changes by age class in U.S. wildlife-related recreation, 1991 to 2001

(participation rate = participants / population)



is real and not apparent (and only future monitoring can provide that distinction), it would be indicative of a relative drop of overall recreation involvement by the youngest Minnesota adults.

Based on assessments of historical records this study was able to assemble, decreasing per-capita recreation involvement has not always been the case at the national or Minnesota scale. In earlier time periods, increasing per-capita involvement was not unusual. Decreasing per-capita participation—especially the strong decreases—is of more recent vintage.

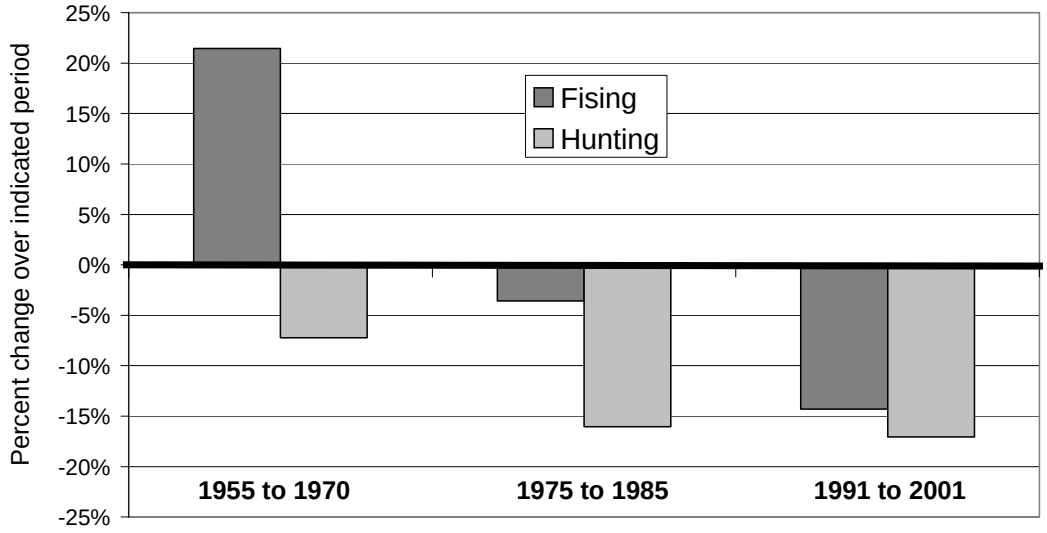
At the national scale, fishing participation was increasing faster than population in the 1955 to 1970 period, and hunting—although decreasing slightly—was just about maintaining a constant per-capita rate (Figure 6). In later time periods, both fishing and hunting had increasingly negative participation-rate changes.

In a similar historical sequence, both U.S. National Park and Minnesota State Park attendance per-capita increased in the 1980s, and decreased in the 1990s (Reference 10 & 11)(see Figure 7). Recent per-capita decreases in use are also evident for Twin Cities regional parks and trails (Reference 12)(see Figure 8).

Figure 6

Trends in U.S. hunting and fishing participation rates from the 1950s*

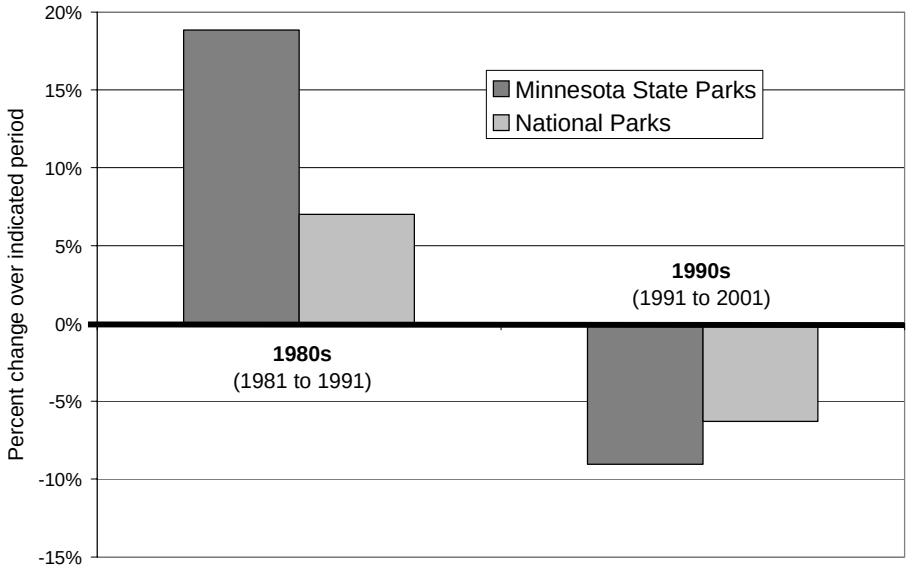
(participation rate = participants / population)



* Source: 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. U.S. Department of Interior, Fish and Wildlife Service; and U.S. Department of Commerce, Census Bureau. The 2001 document contains all of these historical data.

Figure 7

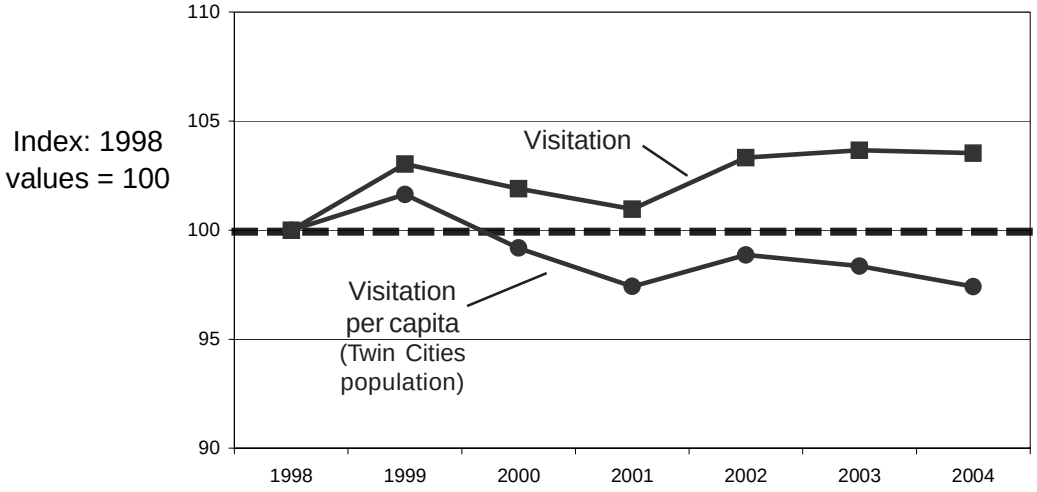
Trends in MN State Park and National Park visits per capita from the 1980s*



*Sources: Park visitation figures are from MN DNR and NPS. Visitation figures are three-year averages (e.g., 1991 is an average of 1990, 1991 and 1992. Visitation at parks that opened between two comparison years is excluded. Population figures are from the U.S. Census and are linearly interpolated between decennial census years; 2001 figures are estimates from the U.S. Census Bureau.

Figure 8

Visitation trends at regional parks and trails that existed in 1998 in the Twin Cities Metropolitan Region*
(53 regional parks, 16 regional trails)



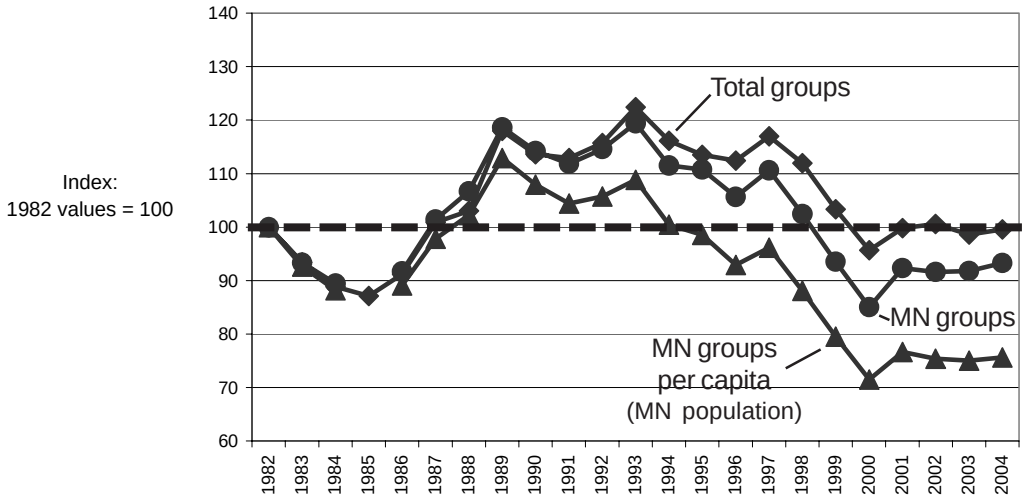
*Source: Visitation data from Metropolitan Council. Twin Cities seven-county population data from U.S. Census Bureau.

Although Twin Cities regional park and trail use has increased since 1998, population has increased even faster, which means less use per capita. [Note: 1998 is the first year available from the new standardized monitoring of Twin Cities park and trail use; monitoring began in 1995 and it takes four years of accumulated data to report for a year.]

The final historical trend-series assessment comes from a place that is as far as you can get in a recreational sense from the Twin Cities metro area. It is from the Boundary Waters Canoe Area Wilderness (BWCAW), located along the Canadian border in northeastern Minnesota. The assessment shows a decreasing per-capita use trend for Minnesotans in recent years, preceded by an increase (Figure 9). This pattern of change is similar to that experienced by Minnesota State Parks.

Figure 9

Trends in May-to-September overnight group permits in the BWCAW*



* Sources: Superior National Forest. The permit data for 1999 to 2004 are from a new permit system are considered preliminary at this time. Population figures are from the U.S. Census and are linearly interpolated between decennial census years; 2001-2004 figures are estimates from the U.S. Census Bureau.

The BWCAW trend measure is yearly May-September overnight quota permits since 1982, when standard reporting of these permit data began (Reference 13). The BWCAW is a formal wilderness, and quotas are established to limit use and maintain a wilderness experience for visitors. Quotas are managed through the permit system. The large majority of the BWCAW annual use (in terms of recreational visitor days) is connected to these overnight permits. Origin (state) of the user is tied to the origin of the person who applies for the group permit.

Total overnight group permits at first decreased in the early 1980s (probably associated with decreasing quotas for motorboats), then rose to the late 1980s, after which they stayed relatively constant for about 10 years until the latter part of the 1990s. Permits numbers then fell and have remained stable over the last few years (the permit data for 1999 to 2004 are from a new permit system and are considered preliminary at this time; some revisions may be made in the near future). The relatively constant period from the late 1980s through the latter part of the 1990s occurred during the sizable drop (27% decrease) between 1993 and 1994 in the number of May-September overnight quota permits. At present, just over half (54%) of the available May-September overnight permit quota is used.

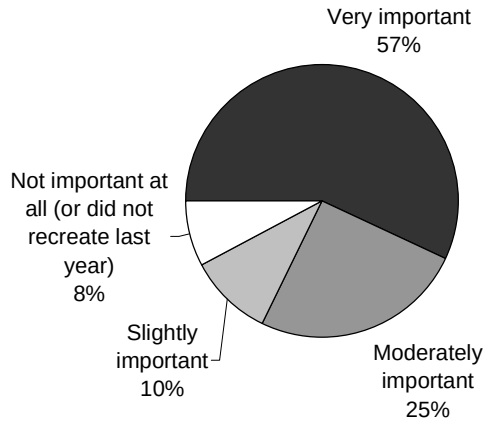
Since 1994 when the current May-September overnight quotas were implemented, the per-capita index of Minnesota groups has shown an overall decrease of about 25 percent. In the years prior to 1994, this per-capita index rose overall.

Altogether, the historical BWCAW trend, plus the park and activity trends may be indicative of a diminishing desire of people for a wide variety of outdoor recreation pursuits. They may be indicative of the diminishing importance of outdoor recreation in the scheme of people's lives. Only time will tell whether this is true. Aspects of the American culture regularly experience phases of increasing and decreasing popularity. The outdoor recreation aspect of the culture should not be expected to be any different.

As part of the planned routine monitoring of the changing nature of recreation in Minnesota, one question monitors the general importance of outdoor recreation to adult Minnesotans: How important a part of your life is outdoor recreation? Responses to this question in 2004 show that a majority (57%) of adults believe outdoor recreation is a "very important" part of their life (Figure 10). Not

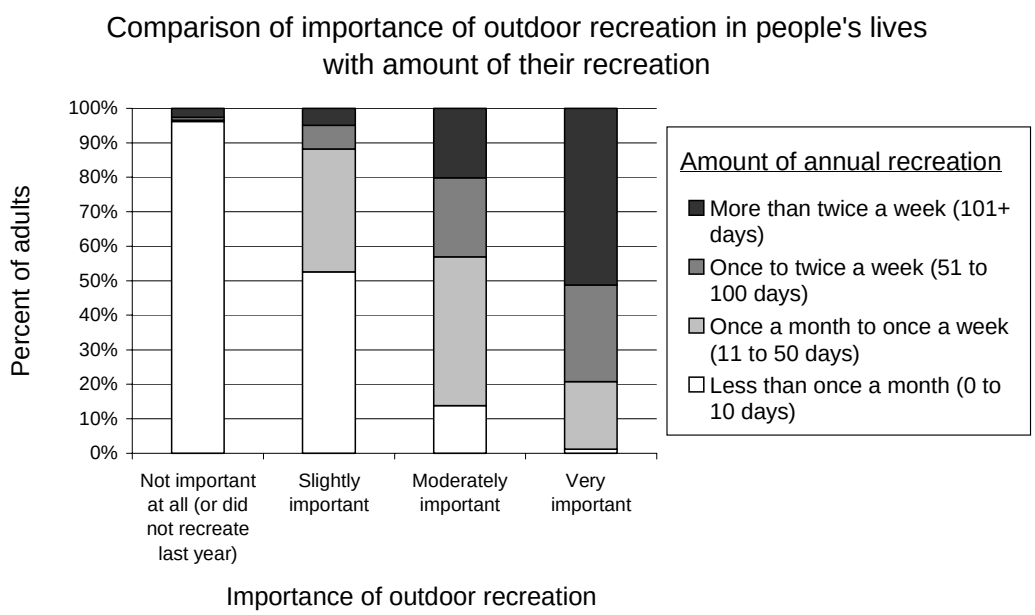
Figure 10

How important a part of your life is outdoor recreation?



surprisingly, the importance ascribed to recreation is closely connected to the amount of recreation participation (Figure 11). Future assessments of this question should prove most interesting.

Figure 11



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3. U. S. Department of the Interior, Fish and Wildlife Service, Division of Federal Assistance. Historical data on fishing and hunting license sales by state: http://federalaid.fws.gov/financialinfo/finainfo.html .

4. U. S. Department of the Interior, Fish and Wildlife Service and U. S. Department of Commerce, U. S. Census Bureau. 1955 to 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation.

   An analysis of these and related data are presented in: Kelly, Tim. 2005. Outdoor recreation participation trends in wildlife-related activities (fishing, hunting, wildlife observation) and recreational boating. A background report for Minnesota State Comprehensive Outdoor Recreation Planning. Minnesota Department of Natural Resources, Office of Management and Budget Services.

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6. Minnesota Department of Administration, Minnesota Planning, State Demographic Center. (i) 2002. Minnesota Population Projections 2000 - 2030; and (ii) 1998. Minnesota Population Projections 1995 - 2025.

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APPENDIX A

INFORMATION ON ACTIVITY TRENDS AND DATA ANALYSIS PROCEDURES FOR ACTIVITY PROJECTIONS

CONTENTS

Activity projection procedures

The procedures used to derive activity projections follow a standard three-step format:

1. The measure of activity involvement over the most recent 10 years is normalized by the relevant population to derive a per-capita data series. The measure of activity involvement is either the number of participants, amount of use, or registered recreational vehicles. The relevant population may be age specific (e.g., age 16+ for fishing licenses), and may refer to the U.S. as a whole or Minnesota or a portion of Minnesota (e.g., seven-county Twin Cities metropolitan area).
2. A linear regression line is fit to the data series in #1, and the percent change along the regression line between the first and tenth year is computed. If the slope of the regression line is not statistically different from zero (which occurred in 3 of the 18 cases), the slope is set at zero (i.e., percent change is set to zero).
3. The percent change in #2 is assessed against the current (2004) percent of population participating in an activity to derive the percent participating 10 years later in 2014. The 2014 percent is then multiplied by the projected population 10 years later to get the number of participants. The number of participants is subsequently multiplied by the 2004 annual activity hours per participant value to compute 2014 activity hours. The assumption is made that added (and subtracted) activity participants are typical in terms of activity hours per year.

Steps 1 to 3 were done for all but two activities, whose measures were vehicle registration trends. One of these (Minnesota ATV registrations) was examined differently because it was expanding so rapidly. ATV registrations over the last 10 years were examined in three ways: (i) all of the 10 years, (ii) first 5 years, (iii) last 5 years. All three of these measures (as shown below) are nearly the same, so the entire ten-year trend was used. The other of these was Minnesota snowmobile registrations, which were rather erratic over the last 10 years, perhaps due—at least in part—to variable snow conditions. Snowmobile registrations were examined in the same way as ATV registrations: (i) all of the 10 years, (ii) first 5 years, (iii) last 5 years. The last 5 years differed materially from the first 5, so the last 5 were used to derive the trend for the projections (see below for snowmobile data).

Results of activity trend analysis

The results of the ten-year activity-participation trend analysis is shown in the table below. The "participation rate change" in Table A-1 is the percent change in step 2 above. It is used to derive the ten-year projected activity participation rates, number of participants and activity hours.

Table A-1

Estimates of recent activity participation rate changes used in ten-year projections

("recent" is last 10 years; participation rate = activity participants / population)

Category	Activity	Recent participation rate change (percent)
A. Estimates based on MN-specific activity trend data		
	Boating of all types, excluding fishing from a boat	-11.5%
	Fishing of all types	-18.4%
	Visiting outdoor zoos	-24.7%
	Visiting historic or archaeological sites	-21.6%
	Viewing, identifying or photographing birds and other wildlife	-22.0%
	Hunting of all types	-11.2%
	Offroad ATV driving	251.9%
	Snowmobiling	-16.8%
B. Estimates based on U.S. trend data closely related to target activity		
	Biking (bicycling outdoors of all types, including mountain biking)	-38.5%
	Camping of all types	15.8%
	Golfing	0.0%
	Outdoor field sports (e.g., soccer, softball/baseball football)	-24.5%
	Inline skating, rollerblading, roller skating, roller skiing	-44.8%
	Downhill skiing/snowboarding	0.0%
	Cross country skiing	-51.4%
C. Estimates based on U.S. trend data somewhat related to target activity		
	Walking/hiking (walking of hiking outdoors for exercise or pleasure)	0.0%
	Swimming or wading (all places)	-24.8%
	Outdoor court sports (e.g., volleyball, basketball tennis, horseshoes)	-31.6%
	Running or jogging	6.8%
	Ice skating/hockey outdoors	-40.9%
D. No estimates due to lack of any trend data		
	Driving for pleasure on scenic roads or in a park	---
	Picnicking	---
	Visiting nature centers	---
	Sledding and snow tubing	---
	Viewing, identifying or photographing wildflowers, trees, natural vegetation	---
	Gather mushrooms, berries, or other wild foods	---
	Horseback riding	---
	Snowshoeing	---

The data sources used for each activity are given in Table A-2 on the next page. All population figures—used to derive per-capita activity measures—are from the U.S. Census and are linearly interpolated between decennial census years; 2001-2004 figures are estimates from the U.S. Census Bureau.

Information for activity trend analysis

Activity: Recreational boating, excluding fishing from a boat

Five recreational boating studies have been conducted from the 1980s into recent years. All five lead to the same conclusion regarding trends: the number of boats on the water has neither increased nor decreased significantly (changes are assessed statistically at the .05 level). In the studies, boats are counted from aircraft on summer weekend/holiday afternoons.

The studies cover a range of boating conditions in Minnesota. Two large, very intensely used boating resources are covered by the studies (Lake Minnetonka located in the western part of the Twin Cities metropolitan area—Figure A-1, and the Lower St. Croix River located in the eastern part of the Twin Cities—Figure A-2). Other Twin Cities boating lakes are covered in a separate regional boating study (Figure A-3). More rural, less intensely used lakes are covered by two regional boating studies: one in Central and one in North Central Minnesota (Figure A-3). The more rural lake regions are used three to five times less intensely than typical Twin Cities' lakes.

In some of the studies fishing is a small portion of all boating (e.g., Lake Minnetonka and St. Croix River—less than 20% of all boating) and in others it is a larger portion (e.g., Central Lakes Region—just over 50% of all boating). The stable boat numbers over time are assumed here to apply whether or not fishing from a boat is included or excluded.

The "participation rate trend" over the recent ten-year period is derived from constant boating use divided by the increase in population (age 16+) over the period. The per-capita data series indexed to 1994=100 is:

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Index	100	99	97	96	95	94	93	92	91	90	88

Table A-2

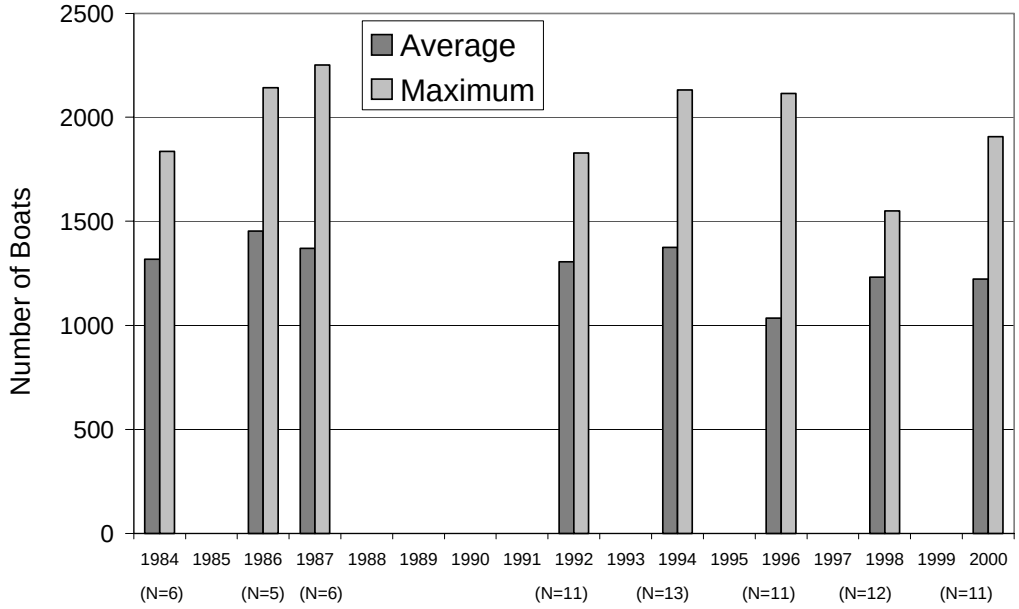
Sources of information on recent activity participation rate changes used in ten-year projections

("recent" is last 10 years)

Category	Activity	Source of information used to estimate activity trend
A. Estimates based on MN-specific activity trend data		
	Boating of all types, excluding fishing from a boat	Boating studies from MN DNR and MN-WI BAC
	Fishing of all types	MN DNR licensed anglers
	Visiting outdoor zoos	MN Zoo + Duluth Zoo attendance
	Visiting historic or archaeological sites	MHS attendance at nine outdoor sites
	Viewing, identifying or photographing birds and other wildlife	USFWS survey participation rate for MN wildlife watching
	Hunting of all types	MN DNR licensed hunters
	Offroad ATV driving	MN DNR registered ATVs
	Snowmobiling	MN DNR registered snowmobiles
B. Estimates based on U.S. trend data closely related to target activity		
	Biking (bicycling outdoors of all types, including mountain biking)	NSGA participation survey: Bicycle Riding
	Camping of all types	NSGA participation survey: Camping (vacation/overnite)
	Golfing	NSGA participation survey: Golf
	Outdoor field sports (e.g., soccer, softball/baseball football)	NSGA participation survey: Baseball + Football (tackle) + Football (touch) + Soccer + Softball
	Inline skating, rollerblading, roller skating, roller skiing	NSGA participation survey: Inline Roller Skating
	Downhill skiing/snowboarding	NSGA participation survey: Skiing (alpine) + Snowboarding
	Cross country skiing	NSGA participation survey: Skiing (cross country)
C. Estimates based on U.S. trend data somewhat related to target activity		
	Walking/hiking (walking or hiking outdoors for exercise or pleasure)	NSGA participation survey: Hiking + Exercise Walking (includes indoor and outdoor participants)
	Swimming or wading (all places)	NSGA participation survey: Swimming (includes indoor and outdoor participants)
	Outdoor court sports (e.g., volleyball, basketball tennis, horseshoes)	NSGA participation survey: Basketball + Tennis + Volleyball (includes indoor and outdoor participants)
	Running or jogging	NSGA participation survey: Running/Jogging (includes indoor and outdoor participants)
	Ice skating/hockey outdoors	NSGA participation survey: Ice/Figure Skating + Hockey (ice) (includes indoor and outdoor participants
D. No estimates due to lack of any trend data		
	Driving for pleasure on scenic roads or in a park	---
	Picnicking	---
	Visiting nature centers	---
	Sledding and snow tubing	---
	Viewing, identifying or photographing wildflowers, trees, natural vegetation	---
	Gather mushrooms, berries, or other wild foods	---
	Horseback riding	---
	Snowshoeing	---

Figure A-1

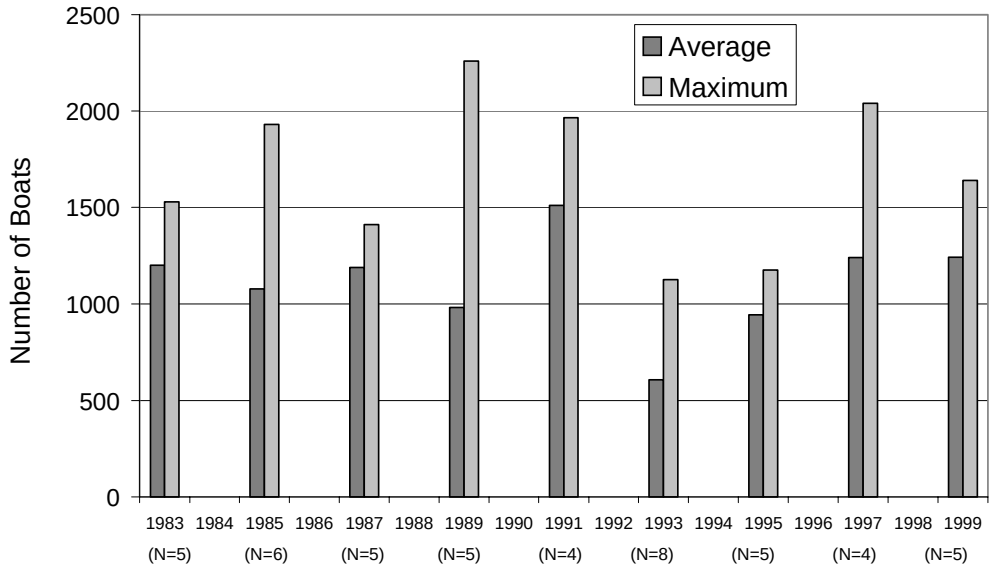
Lake Minnetonka Weekend/Holiday Afternoon Aerial Boat Counts*



* excludes 4 inclement weather counts between 1984 and 2000

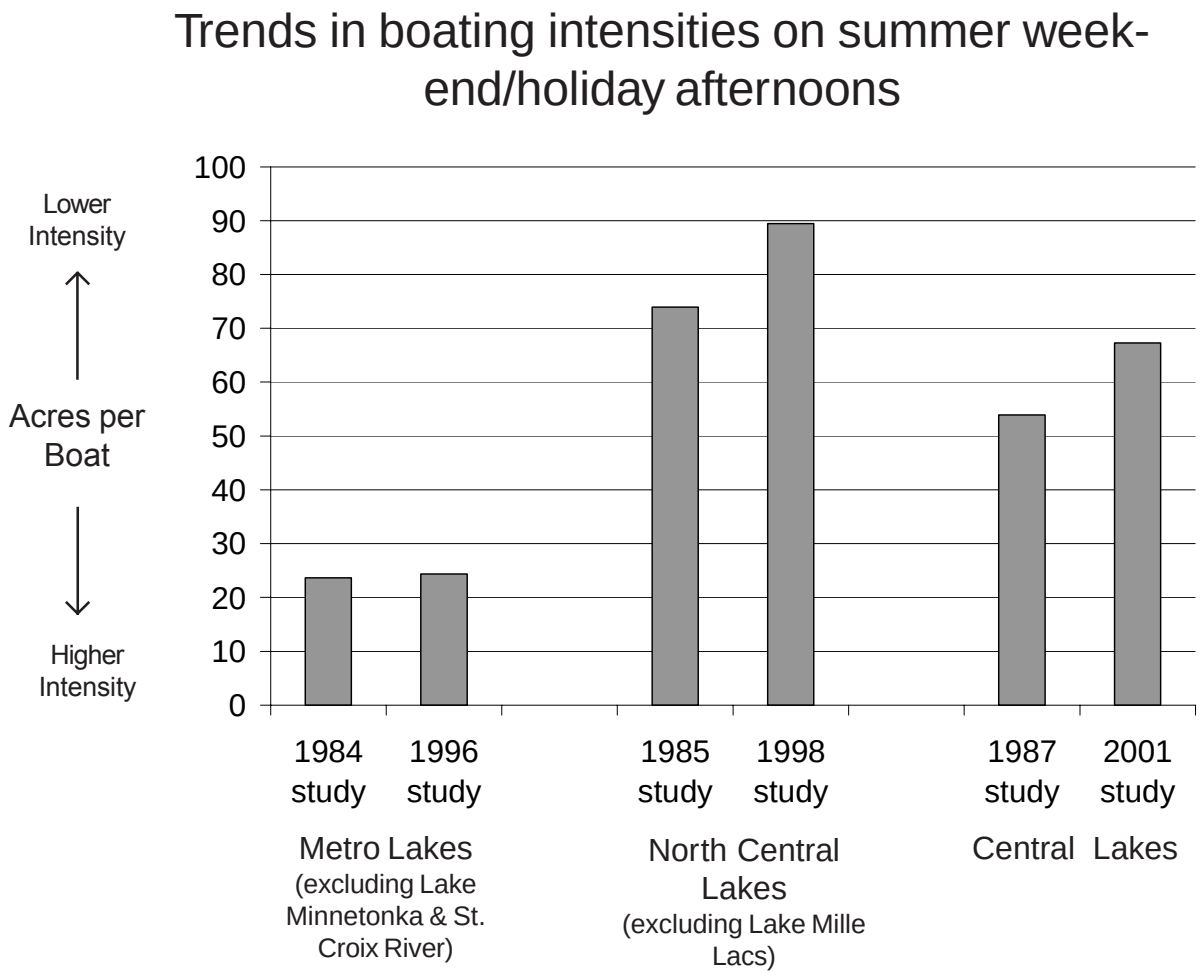
Figure A-2

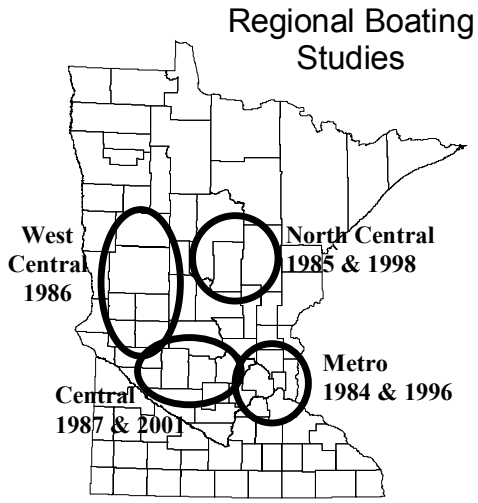
Lower St. Croix River Weekend/Holiday Afternoon Aerial Boat Counts*



*counts beginning between noon and 6 p.m. Source of data is MWBAC, 1983 to 1999.

Figure A-3


Trends in boating intensities on summer week-end/holiday afternoons
Lower Intensity
Acres per Boat
Higher Intensity
100
90
80
70
60
50
40
30
20
10
0
1984 study
1996 study
1985 study
1998 study
1987 study
2001 study
Metro Lakes
(excluding Lake Minnetonka & St. Croix River)
North Central Lakes
(excluding Lake Mille Lacs)
Central Lakes


Regional Boating Studies
West Central 1986
North Central 1985 & 1998
Metro 1984 & 1996
Central 1987 & 2001

Activity: Fishing and hunting of all types

Minnesota fishing and hunting participation trends are assessed through license sales records maintained by the MN DNR. As part of federal aid apportionment since 1957, Minnesota has certified with the U.S. FWS the number of licensed hunters and anglers in Minnesota. The certification records, based on actual license sales, contain the resident/nonresident split in licensed individuals since 1969.

For trend analysis, the resident (Minnesotan) information from 1994 to 2004 is used. The number of licensed Minnesotans is examined relative to the size of the Minnesota population (aged 16+) to get a measure of the participation rate in hunting and fishing (Figure A-4 and A-5). This participation rate is the per-capita data series for trend analysis.

Figure A-4

Percent of MN population (aged 16+) who hold a MN **fishing** license, 1969 to 2004

(Source: MN DNR & U.S. Bureau of the Census)

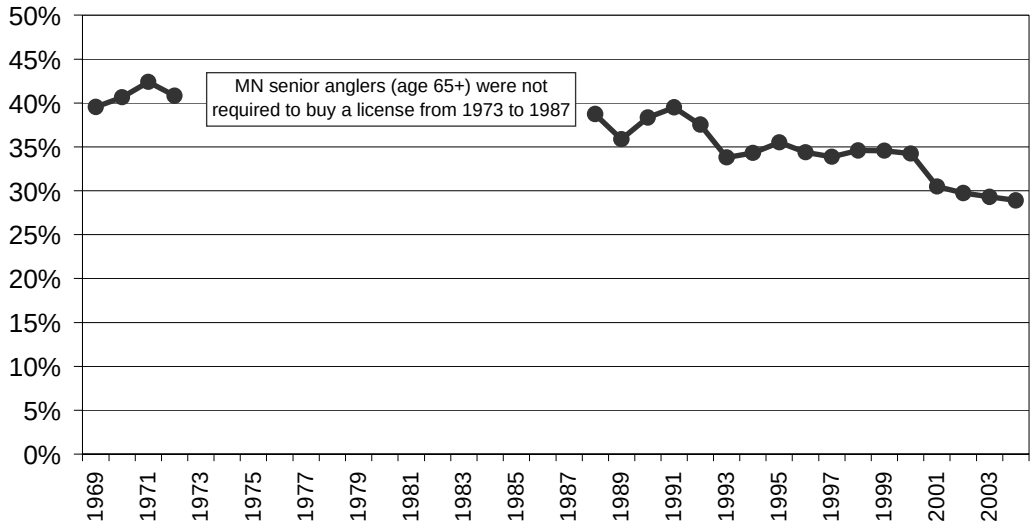
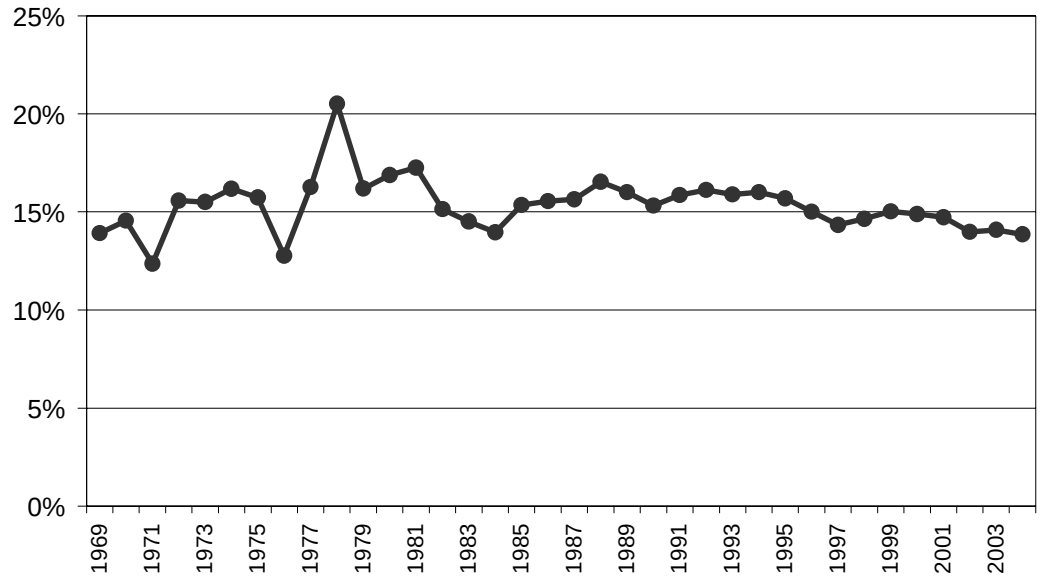


Figure A-5

Percent of MN population (aged 16+) who hold a MN **hunting** license, 1969 to 2004

(Source: MN DNR & U.S. Bureau of the Census)



Activity: Visiting outdoor zoos

The measure of activity involvement over the most recent 10 years is annual zoo attendance at the Minnesota plus Duluth Zoo from 1994 to 2004. Zoo attendance is normalized by the Minnesota population to derive the per-capita data series for trend analysis. The per-capita data series indexed to 1994=100 is:

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Index	100	95	95	104	105	93	87	84	80	77	79

Activity: Visiting historic or archaeological sites

The measure of activity involvement over the most recent 10 years is annual attendance at nine outdoor sites maintained by the Minnesota Historical Society. Site attendance from 1994 to 2004 is normalized by the Minnesota population to derive the per-capita data series for trend analysis. The nine sites are: Forest History Center, Forestville, Fort Ridgely, Fort Snelling, Jeffers Petroglyphs, Kelley Farm, Lower Sioux Agency, North West Company Fur Post, and Split Rock Lighthouse.

The per-capita data series indexed to 1994=100 is:

	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Index	100	98	95	94	97	95	94	97	86	83	69

Activity: Viewing, identifying or photographing birds and other wildlife

The measure of activity involvement over a recent 10-years period comes from the 1991 and 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation from the U.S. Fish and Wildlife Service and the U.S. Census Bureau. The surveys measure the percent of the Minnesota population (aged 16+) that participates annually in wildlife-watching. Wildlife-watching is broken into two types: (1) away from home; and (2) total, which includes away from home plus near-home activity. "Away from home" is over one mile from home.

The participation rate change from 1991 to 2001 for each of the two types of wildlife-watching is: (1) away from home = -35.5%; and (2) total = -8.5%. Since both types are relevant to the target activity, and since they differed by such a large margin, the two were averaged for application here (average = -22.0%).

Activity: Offroad ATV driving

The measure of activity involvement over a recent ten-year period comes from the MN DNR recreational ATV registration files. Registered ATVs from 1994 to 2004 are normalized by the Minnesota population (aged 16+) to derive the per-capita data series for trend analysis.

ATVs are increasing very rapidly in Minnesota. For this reason, the per-capita data series was examined differently than for other activities. ATV registrations per capita over the last 10 years were examined in three ways: (i) all of the 10 years, (ii) first 5 years, (iii) last 5 years:

Period	Average annual percent growth for period
1994 to 2004	13.4%
1994 to 1999	13.0%
1999 to 2004	13.8%

Because the growth rate for all three of these periods are nearly the same, the entire 10-year average from 1994 to 2004 was used. When extrapolated for the next 10 years, a 13.4 percent annual growth rate leads to a 252 percent increase.

Activity: Snowmobiling

The measure of activity involvement over a recent 10-years period comes from the MN DNR recreational snowmobile registration files. Registered snowmobiles from 1994 to 2004 are normalized by the Minnesota population (aged 16+) to derive the per-capita data series for trend analysis.

Snowmobile registrations have been erratic in Minnesota over the last 10 years, perhaps due—at least in part—to variable snow conditions. For this reason, the per-capita data series was examined differently than for other activities (examined same way as ATVs). Snowmobile registrations per capita over the last 10 years were examined in three ways: (i) all of the 10 years, (ii) first 5 years, (iii) last 5 years:

Period	Average annual percent growth for period
1994 to 2004	1.6%
1994 to 1999	5.0%
1999 to 2004	-1.8%

Because the growth rates for all three of these periods are so different, the most recent five-year period was selected as the most appropriate for projecting over the next 10 years. When extrapolated for the next 10 years, a -1.8% percent annual growth rate leads to a 17 percent decrease.

Activity: All remaining activities with trend estimates

For all remaining activities for which estimates can be made (Table A-1), the measure of activity involvement over a recent 10-year period comes from the annual participation survey of the National Sporting Goods Association (NSGA). NSGA has yearly reports on national participation in various recreation activities. NSGA activities were matched as closely as possible to the target activities for this study (Table A-2). In some cases, the target activity involved summing NSGA activities, and these are indicated in Table A-2. NSGA participation was normalized by the U.S. population (aged 7+) to derive the per-capita data series for trend analyses.

The per-capita data series for each target activity indexed to 1994=100 is:

Activity	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Biking	100	112	104	87	83	80	80	72	72	69	72
Camping	100	98	101	105	103	110	108	104	117	111	114
Golfing	100	96	91	102	106	103	99	99	100	93	88
Outdoor field sports	nd	100	104	95	93	92	86	84	85	80	81
Inline skating, and related	100	121	128	131	132	116	104	90	88	73	53
Downhill skiing/snowboarding	100	94	104	88	85	79	86	94	92	92	87
Cross country skiing	100	93	92	67	70	58	60	59	55	48	58
Walking/hiking	100	98	101	105	104	106	102	99	103	101	104
Swimming/wading	100	101	97	95	92	90	90	83	80	78	78
Outdoor court sports	100	105	105	100	92	86	80	82	81	75	75
Running or jogging	100	99	105	101	104	102	103	109	109	104	106
Ice skating/hockey outdoors	100	101	105	97	97	92	83	71	nd	65	nd

References for information sources

ACTIVITY INFORMATION

Note: Activity trend information and related analyses for recreational boating, hunitng, fishing, and wildlife-watching are available in a separate report: Kelly, Tim. 2005. Outdoor recreation participation trends in wildlife-related activities (fishing, hunting, wildlife observation) and recreational boating. A background report for Minnesota State Comprehensive Outdoor Recreation Planning. Minnesota Department of Natural Resources, Office of Management and Budget Services.

Activity: Recreational boating, excluding fishing from a boat

Minnesota Department of Natural Resources:

1997. Boating in the Twin Cities Metropolitan Area: Current Status (1996) and Trends Since 1984.

1999. Boating in North Central Minnesota: Status in 1998 and Trends Since 1985.

2001. Boating Trends on Lake Minnetonka, 1984 to 2000. Boating studies are done in cooperation with the Lake Minnetonka Conservation District.

2002. Boating in Central Minnesota: Status in 2001 and Trends Since 1987.

Minnesota-Wisconsin Boundary Area Commission:

Recreational boating studies (ever two years from 1983 to 1999) of the Lower St. Croix National Scenic Riverway.

Activity: Fishing and hunting of all types

Minnesota Department of Natural Resource. Historical information on licensing of hunters and anglers.

Activity: Visiting outdoor zoos

Historical attendance information received in May-June 2005 from Minnesota Zoo and Duluth Zoo.

Activity: Visiting historic or archaeological sites

Historical attendance information received in May-June 2005 from Minnesota Historical Society.

Activity: Viewing, identifying or photographing birds and other wildlife

U. S. Department of the Interior, Fish and Wildlife Service and U. S. Department of Commerce, U. S. Census Bureau. National Survey of Fishing, Hunting, and Wildlife-Associated Recreation. Survey years 1991 to 2001.

Activity: Offroad ATV driving

Minnesota Department of Natural Resource. Historical information on recreational vehicle registrations.

Activity: Snowmobiling

Minnesota Department of Natural Resource. Historical information on recreational vehicle registrations.

Activity: All remaining activities with trend estimates

Annual national survey information from National Sporting Goods Association (NSGA) through 2004. All information received in May 2005 directly from NSGA, Dan Kasen, Manager of Information Services. The May 2005 data set contained all revisions to date made to the participation data, and, thus, may differ from former NSGA data sets that have not been revised.

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