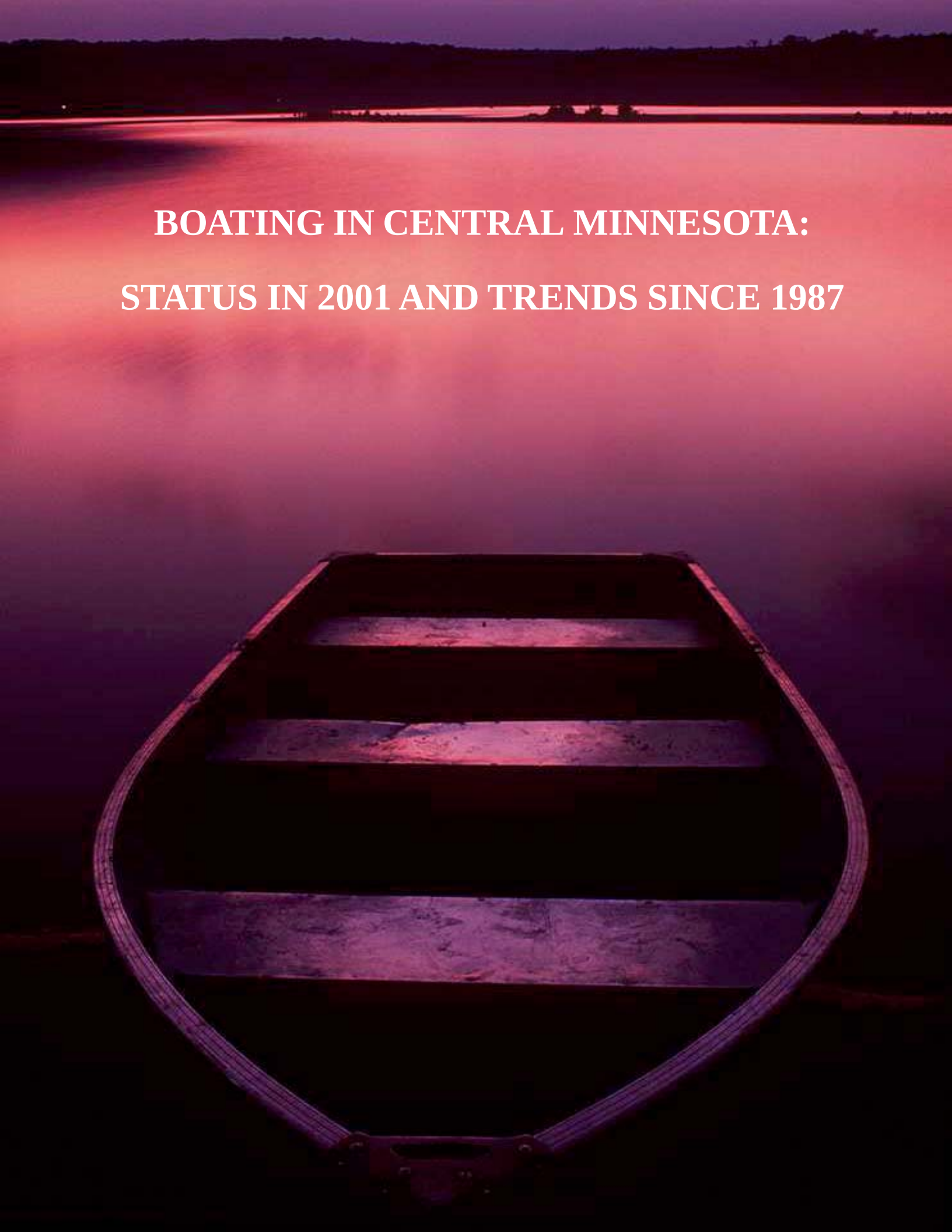
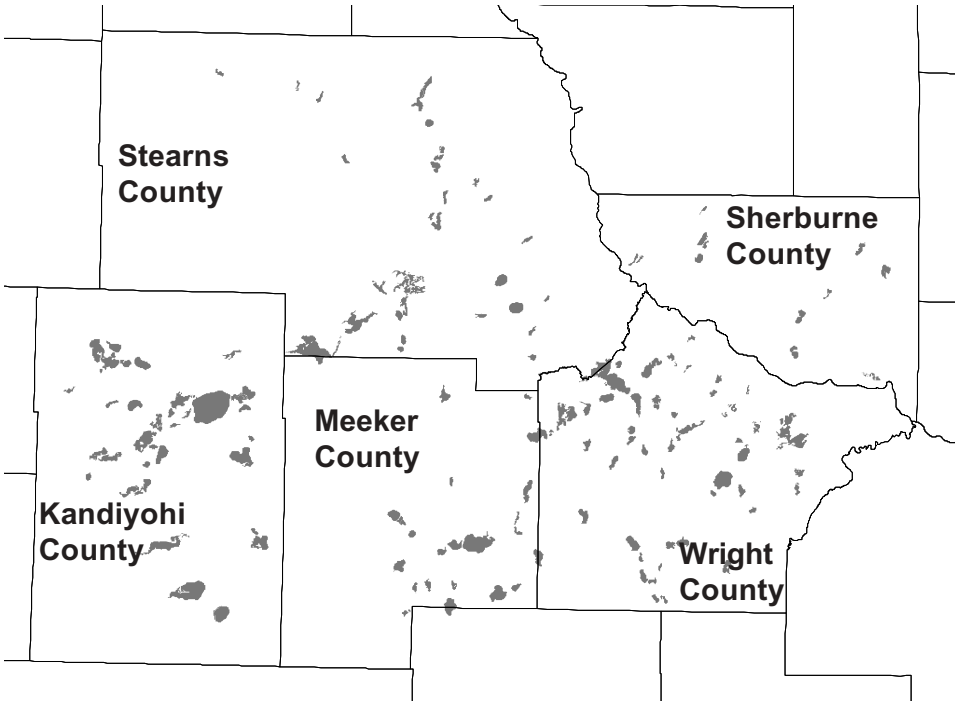


BOATING IN CENTRAL MINNESOTA:

STATUS IN 2001 AND TRENDS SINCE 1987

BOATING IN CENTRAL MINNESOTA: STATUS IN 2001 AND TRENDS SINCE 1987



The 2001 Central Boating Study was a cooperative research project of the Minnesota Department of Natural Resources Boating Safety Program, and Trails and Waterways Division

Report prepared by:
Office of Management and Budget Services
Minnesota Department of Natural Resources

August 2002

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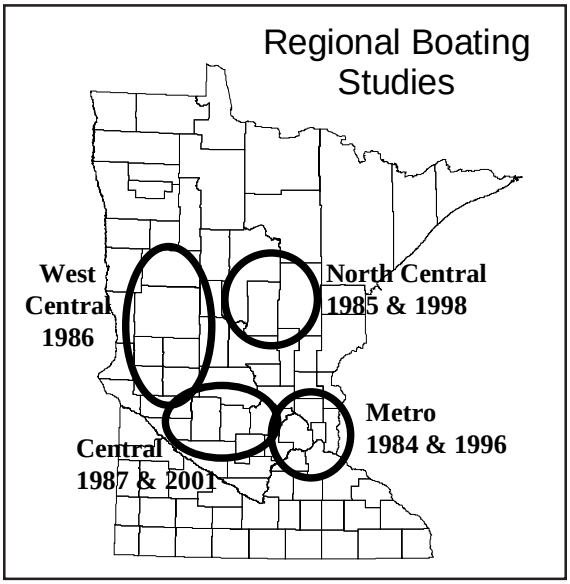
CONTENTS

SUMMARY

INTRODUCTION

The central lake region is the third region to receive an update study from the 1980s. Previous update studies occurred in the Twin Cities metro region and in the north central region. The update studies provide descriptions of how recreational boating is changing around Minnesota.



The central lake region is being progressively drawn into the greater Twin Cities metropolitan area, especially the counties of Wright, Stearns and Sherburne. The five-county central-lake region experienced a population growth of 22 percent in the 1990s, nearly twice the rate of growth for the state as a whole. And it is projected to grow more than twice the rate of the state for the next 25 years. Population growth will fuel demand for access to the water for recreational pursuits, as well as demand for home sites in attractive lakeside locations. Pressure on the region's lake resources can only be expected to grow for the foreseeable future.

This boating study has three broad goals: describe the many facets of the boating experience; measure the total number of boats on lakes and trace those boats to their means of access; and provide information to guide public access programs. The goals are accomplished through a combination of aerial observations and boater surveys with public access users, commercial access users and riparian residents. Specific study objectives are:

- Measure the total number of boats on lakes and tracing those boats to their means of access;
- Describe the boater's experience on the water, including trip satisfaction, on-water problems, and crowding;
- Describe the boater's perception of public accesses, including quality, use problems, improvements needed, and desire for additional access;
- Describe the boater's view of boating safety and enforcement concerns, including boating restrictions, enforcement presence, safety courses, beverages consumed on boats, and safety equipment; and
- Describe the characteristics of the boating trip, including boating activities, boating equipment, and boater characteristics.

This study is an update of a study done in 1987, and changes since 1987 are presented throughout the report. Two MN DNR programs provided resources for this study: water recreation and boating safety.

BOAT NUMBERS AND SOURCES

The central region has nearly 90,000 acres of boating water on 148 lakes. The majority of lakes (80%) had at least minimal public access in 2001, up from 68 percent with access in 1987. Minimal public access is not synonymous with adequate public access. Minimal access only involves the presence of a public access launch facility, while adequate access incorporates the number, size and location of facilities, as well as facility characteristics such as good launching depth and amenities such as a dock to ease launching and landing.

Lakes with public access are used more intensively than lakes without public access. Within the lake classes that have public access, the priority A/B lakes are used the most intensively, and the large-lake class the least intensively, although the differences are not as dramatic as the difference between having and not having public access. The Mississippi River has an intensity of boating use between the lakes with public access and lakes without public access. Boating intensities in the study are higher than those found in the more rural north central region, but are substantially lower (3 to 4 times lower) than those found in the Twin Cities metro area.

Between 1987 and 2001 the number of boats on lakes did not change significantly overall, similar to what was found between studies in the north central and metro regions. Apparently, the typical boat is being used less today than 15 years ago, since boat registrations in Minnesota have risen over 20 percent since the mid 1980s. This lack of change is somewhat contrary to boaters' perception of congestion and crowding on the water, which crept up between 1987 and 2001 (14% of boaters thought lakes were crowded in 2001, up from 10% in 1987—see section below on the boating experience)

Public access contributes 45 percent of boats on the water, commercial access (e.g., resorts and private campgrounds) contributes another 6 percent, and all other sources (mainly riparian residents) contribute nearly half (49%). Between 1987 and 2001, source contributions showed little change. In the north central and metro boating studies, the pattern of source change was different: public access contribution went up, commercial access contribution went down, and the riparian resident contribution stayed about the same.

THE BOATING EXPERIENCE

Boating trip satisfaction is high in the north central lake region: just over 40 percent of all boaters report being "very satisfied" with their outing, while another 46 percent report being "satisfied", and only 13 percent are "dissatisfied" to any extent. Anglers as a group report lower levels of satisfaction with their trips. Angler dissatisfaction (as found in the north central study) is mainly due to perceptions of fishing quality and behavior of other boaters. In general, trip satisfaction is contingent on the behavior of other boaters—as noted for anglers—and on perceptions of crowding.

When boaters were asked to judge whether they experienced 13 potential problems with other boaters on their trip, none of the 13 was judged by a majority of boaters as a "moderate", "serious" or "very serious" problem. Although not judged by a majority of boaters as a "moderate" or

greater problem, one problem was clearly reported as the largest problem: "use of personal watercraft (jet skis)." The next most frequently indicated problem was boats operating too fast/close to shore/docks, followed by noise, careless/inconsiderate boat operation, and high wakes. The use of personal watercraft also led the list of problems boaters had with other boaters in both the 1998 north central lake region study and the 1996 Twin Cities metro lake study.

Most boaters (87%) did not encounter "too many boats" on their trip. Some 13 percent of boaters did encounter "too may boats", and a similar portion of boaters (14%) judged conditions as crowded. Perceptions of crowding have risen modestly since 1987, when 10 percent of boaters judged conditions as crowded. The rise in perceptions of crowding is not wholly consistent with the stable boat numbers on the lakes. But boaters can feel crowded for reasons other than the sheer number of boats, and it may be that a combination of factors—personal watercraft; larger, faster-moving boats; more noise—are giving rise to more perceived crowding. Personal watercraft are more prevalent than in the 1987 study, boats are larger and more powerful than in 1987, and more boaters are engaging in boat riding and fewer in fishing than in 1987 (see section below on characteristics of the boating trip).

PUBLIC ACCESS FACILITIES

The use of public accesses has changed since 1987, and public accesses—it appears—are becoming more and more an asset that all lake interests take advantage of, including riparian residents and commercial boating-related interests. In 2001, riparian residents and resort-campground guests are estimated to account for nearly 20 percent (18%) of traffic through the public accesses, up from 7 percent in 1987. This same pattern of change was experienced in the north central region between 1985 and 1998. The reason for change in the use of public accesses is unknown, but one hypothesis comes to mind: the increasing size of boats and motors (see section below on characteristics of the boating trip), and associated need to launch/land these boats at a well designed access facility.

Boaters give high marks to public access facilities for launching and landing a boat. Positive ratings ("good" to "excellent") comprise 70 percent of boater ratings, while few boaters give negative ratings (8%). High ratings extend across the lake classes. The current high ratings represent a small improvement over the 1987 ratings.

There are problems, however, in the use of the public access facilities. The leading problems have to do with the perceived small size of many parts of the access facility: insufficient parking spaces, not enough maneuvering room on land/water near the ramp, and insufficient number of launch lanes. None of these specific problems was all that common. The top-ranked problem was identified by less than 10 percent of access users (9%). However, experiencing a problem significantly lowers boaters' ratings of access facilities.

When asked what improvements are needed at access sites, boaters suggested improvements that solve their use problems. The top-ranked improvements had to do with expanding the size of the facility: more parking spaces in the lot (37% of users) and more launch lanes/ramps (17% of users). Other improvements suggested by over 15 percent of users included two lighting concerns, which

appear to suggest that boaters desire to extend their boating trips beyond daylight hours: better lighting of access/parking area (18%), and a beacon light visible from the lake (16%). Requests for trash containers were also a top-ranked improvement (27%).

The majority of all boaters (59%), and 40 percent of riparian residents use additional lakes near the lake where they were surveyed. Access to these additional lakes is dominated by public access.

A large portion of public access users (53%) have at some time in their past found a public access parking lot full on the lake they were surveyed. On average, this happened twice (median) in the last year. Most of them were able to find a way to boat that day. They either parked on the road, went to another access on the lake, or whet to another lake.

Full parking lots and congested facilities (noted earlier) give boaters reasons to want additional public access facilities. This want, or perceived need, for additional public access was examined in the survey in two ways: (1) for the lake at which the boaters were surveyed, and (2) for any lake within 50 miles of the lake at which they were surveyed.

For the lake at which they were surveyed, some 17 percent of all boaters thought additional public access was needed, 76 percent did not think additional access was needed, and 8 percent were uncertain. Public access boaters were more likely to indicate a need for additional access (32%), but still a majority (56%) did not see a need for more access. Few riparian residents saw a need for more access. The primary reason boaters give for the need for an additional access on the lake is to relieve congestion, a concern public access users indicated when asked to describe problems they had with the public access launch facility.

Results are similar for the perceived need for additional public accesses within 50 miles of the lake at which boaters were surveyed, except that more boaters are uncertain of the need in the 50-mile radius area (expressed in the more frequent “don’t know” responses).

BOATING SAFETY AND ENFORCEMENT

Special boating restrictions are not very common on central region lakes. Existing restrictions—on the sample lakes surveyed in this study—are a handful of speed, no wake restrictions in channel areas. Not surprisingly, few boaters (3%) believe that the current level of boating restrictions is “too restrictive.” Somewhat more boaters (13%) believe it is “not restrictive enough”, and the largest group (46%) believes it is “about right.” The remaining boaters (38%) responded that they “don’t know” about the current level of restrictions, indicating that the whole topic of boating restrictions is not on the radar screen of a large portion of central region boaters.

The demand for new restrictions is minor except for one type, which was indicated by a large portion (36%) of boaters: restrictions on the use of personal watercraft (jet skis). Other possible restrictions (time, horsepower and boat type/size) were demanded by few boaters.

Enforcement officers are more likely to be seen by public and commercial access boaters, and are less likely to be seen by riparian residents. About six percent of boaters report being checked by an

officer. Boaters checked by an enforcement officer give high marks to the officer's professional conduct: 61 percent rated that conduct "excellent", another 34 percent rated the conduct "good."

Formal safety courses have been completed by 18 percent of all boaters, very close to the percent who have completed such a course in the north central lake region (20%), but lower than the portion in the Twin Cities lake region (32%). Boaters who have completed a formal safety course are more likely than other boaters (65% compared with 23%) to believe all boaters should be required to complete a safety course. Overall, 30 percent believe all boaters should be required to complete such a course.

Requiring an operators license for motorboat operators is not all that popular, and is supported by only 21% of boaters. More popular is the legal requirement for children younger than 12 to wear a life vest while boating: nearly 70 percent of boaters either "strongly agreed" or "agreed" with this requirement, while only 14 percent either "disagreed" or "strongly disagreed."

Since the 1987 study, Minnesota enacted a law that makes it illegal to operate a motorboat after consuming too much alcohol, very much like the alcohol restrictions on driving an automobile. In 2001, 21 percent of boaters report having some type of alcoholic drinks on board during their trip. Most boaters have no alcohol on the boat: either they have only non-alcoholic drinks on board (57%), or have no drinks of any type (22%). Since 1987, boaters are more likely to have only non-alcoholic beverages on board, and less likely to have no drinks of any type on board. The prevalence of alcoholic drinks is virtually unchanged since 1987.

Most boats (92%) are equipped with some form of safety equipment (e.g., lights, fire extinguishers and horns) other than personal flotation devices. The small portion of boats without any safety equipment (8%) may not need any, because no safety equipment other that personal flotation devices is required for boats less that 16 feet long operated during daylight hours.

Life jackets (personal flotation devices) were more commonly worn in 2001 than in 1987. Increases in life jacket use were found for all age classes of boaters and all sources of boaters. Even with these increases, however, less than half of adults report wearing a life jacket in 2001. For children, the utilization rate in 2001 is nearly 90 percent.

CHARACTERISTICS OF THE BOATING TRIP

There are two main activities on north central lakes: fishing and boat riding. The former is larger than the latter (fishing is 51% of all outings, and boat riding is 32%). Activities have changed since 1987. The major changes have been a sizable drop in fishing and a sizable gain in boat riding. Notable changes of a lesser magnitude are the decrease in water skiing and the increase in "other activities." About 1 percent of "other" is personal watercraft use, which was not measured as a separate activity in 1987.

The changes experienced between 1987 and 2001 are moving the activity patterns of this region closer to that of the Twin Cities metro area, where boat riding is slightly larger than fishing. The same change in activity patterns was found in the north central region between 1985 and 1998,

including the drop in water skiing. Water skiing also showed a decrease in the Twin Cities metro area between 1984 and 1996.

The types of craft most used for boating in 2001 are runabouts and fishing boats, followed by pontoons (runabouts have a deck and windshield; fishing boats are open; a fishing boat is a type of craft, and is not related to the activity of fishing). Pontoons are more common among riparian residents, and fishing boats are more common among public and commercial access boaters. Other craft types are comparatively uncommon. Craft types have changed since 1987: runabouts and pontoons have increased, and fishing boats have decreased.

Boat lengths in 2001 average between 17 and 18 feet, and lengths have increased nearly two feet since 1987.

Most craft have a motor, and only about 2 percent are non-motorized.

Motor sizes in 2001 average 75 horsepower; the median is lower at 55 horsepower. Motor sizes have increased 62 percent since 1987. An increase in motor sizes was also experienced in the north central lake region between 1985 and 1998, and in the Twin Cities lake region between 1984 and 1996.

Boat lengths and motor sizes are smaller than those found in the north central lakes and Twin Cities metro region. Lengths are, on average, about a foot shorter and motor sizes about 25 horsepower smaller.

Boaters, as a group, are familiar with the lake at which they were surveyed. The median length of use of the lake is 11 years. New boaters, who have started boating in the last year on the lake they were surveyed, are not all that common overall (13% of all boaters), but are more common for public and commercial access boaters (21% to 22% of all boaters). The percentage of new boaters among riparian residents is small (3%).

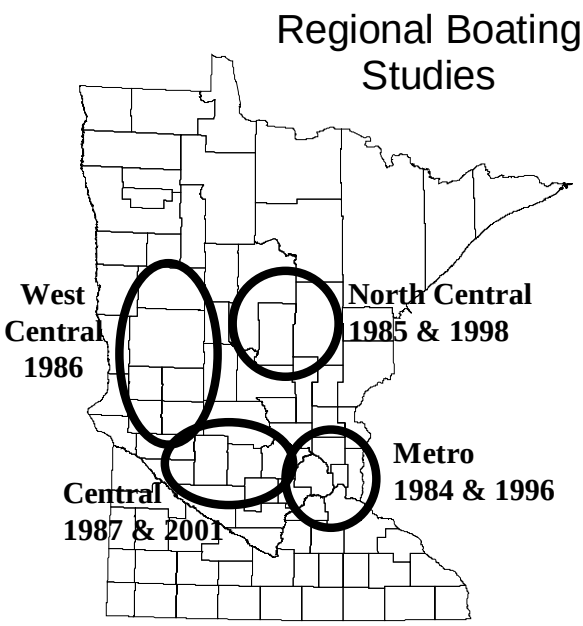
The public and commercial accesses serve two geographic markets. One is the local market (within 25 miles of home; within about a half-hour drive; it accounts for about one-half of access use. The other market is the "tourist" market—over 50 miles or over a one-hour drive from home—and it accounts for about one-quarter of public and commercial access use. Not surprisingly, the commercial accesses (resorts and private campgrounds) predominately serve the tourist market.

The median distance boaters travel to public and commercial accesses in 2001 (25 miles) is not greatly changed since 1987, when it was 28 miles.

INTRODUCTION

The central lake region is the third region to receive an update study from the 1980s. Previous update studies occurred in the Twin Cities metro region (MN DNR, 1997) and in the north central region (MN DNR, 1999) (see Figure 1). The update studies provide descriptions of how recreational boating is changing around Minnesota. Distinctive boating changes were found in both the Twin Cities and north central studies, and the current study will provide further evidence of the general nature of many of these boating changes.

Figure 1



The central lake region is being progressively drawn into the greater Twin Cities metropolitan area, especially the counties of Wright, Stearns and Sherburne. The five-county central-lake region experienced a population growth of 22 percent in the 1990s, nearly twice the rate of growth for the state as a whole (U.S. Census, 1990 and 2000). And it is projected to grow more than twice the rate of the state for the next 25 years (MN Planning, 1998). Population growth will fuel demand for access to the water for recreational pursuits, as well as demand for home sites in attractive lakeside locations. Pressure on the region's lake resources can only be expected to grow for the foreseeable future.

This boating study has three broad goals: (1) describe the boating experience, which includes boating activities, perceptions of conditions on the water, and safety and enforcement concerns; (2) measure the total number of boats on lakes and trace those boats to their means of access; and (3) provide information to guide public access programs by assessing the use of these facilities and evaluating their quality through boater interviews. This study is an update of a study done in 1987, and changes since 1987 are presented throughout the report.

The first goal of the study is to describe the boating experience and see to what extent it has changed. To ensure that boating remains an enjoyable and safe activity is the motivation underlying this aspect of the study. Boater surveys — which cover such topics as trip satisfaction, problems encountered on the water, and perceived crowding — provide an assessment of the boating experience from the boater's perspective.

The second study goal is to measure the total number of boats on lakes and trace those boats to their means of access. Such measurements ensure that people can at least be reasonably well informed and share a common information base when addressing any boating concerns involving the number and source of boats on the water. Boaters gain access to lakes through their own lakehomes, as well as through facilities provided at commercial sites, such as resorts and private campgrounds. The public sector also provides boating opportunities — primarily through free public accesses — for those who do not live on the water or avail themselves of the commercial opportunities.

As indicated above, the public sector provides boating opportunities through free public access. The third goal of this study is to provide information to guide public access programs by assessing the use of these facilities and evaluating their quality through boater interviews. Many levels of government — local, county, state and federal — manage free public accesses in the central region.

This document is a general summary. For those wanting more detail on study results, technical documents, including survey tabulations with breakdowns, and data files are available from the MN DNR.

In this document, boating status and trend findings are presented in five sections:

- Boat numbers and sources of boats;
- Perception of boating experience, including trip satisfaction, on-water problems, and crowding;
- Perception of public accesses, including quality, use problems, improvements needed, and desire for additional access;
- Boating safety and enforcement, including boating restrictions, enforcement presence, safety courses, beverages consumed on boats, and safety equipment; and
- Characteristics of the boating trip, including boating activities, boating equipment, and boater characteristics.

Study results for lakes are presented for lake classes (groupings of lakes), not individual lakes, because the studies were not designed for lake-by-lake results. Lake classes are defined in the next section on methodology. If one is interested in how a particular lake looks according to the information presented in this report, find the class of the lake in 2001 and 1987 and follow the conclusions through for the class(es). Lakes are listed by class in Appendix A.

Two MN DNR programs provided resources for this study: water recreation and boating safety.

METHODOLOGY

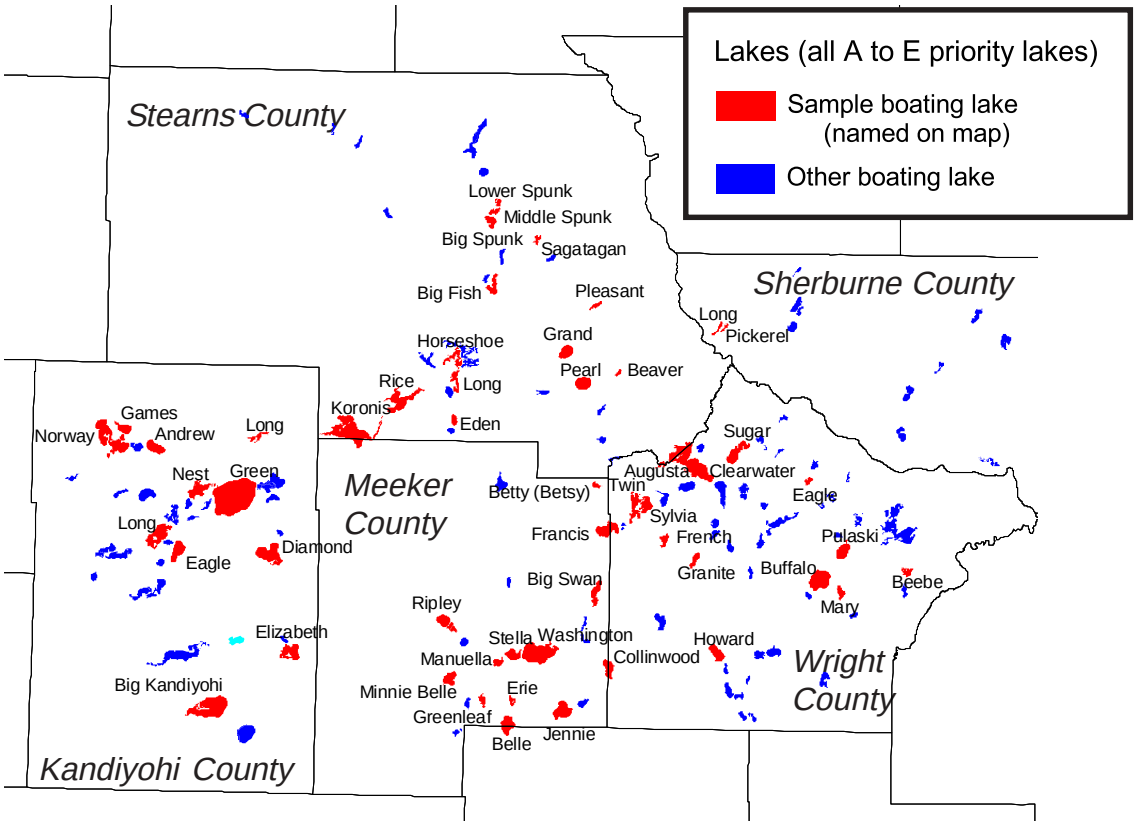
The multiple goals of the central boating study are accomplished with a variety of information collection techniques. Lakes have been classified according to size and clarity, and whether the lake has a free public access. The lake classification based on size and clarity is the one developed by the public access program to prioritize lakes for access. The study covers those lake priority classes that incorporate the principal water recreation resource: lakes over 145 acres in size that support permanent fish populations (Figure 2). The four lake classes are:

- Large boating lakes (e.g., Green in Kandiyohi County, and Clearwater-Augusta in Wright County; all these lakes have public access)
- Priority A and B lakes with public access
- Priority C, D and E lakes with public access
- Lakes without public access (priorities B to E).

Priority A and B lakes are distinguished from C, D and E lakes by their larger size and greater clarity. Size and clarity progressively decrease from A to B to C to D to E lakes.

Within each class, a sample of the lakes is taken for study (see Appendix A for a listing of sample lakes). The sample lakes in 2001 includes the 1987 sample lakes plus a few new lakes. A complete census, however, of the large boating lakes is taken for study. For each study lake, boats in use (including those anchored and beached) are counted and classified by type from the air. Boat counts are made at peak boating times: in the afternoon on weekend/holidays and early evening on weekdays. Aerial observation (including photographs) is also used to measure the contribution of different means of access to boating numbers. Aerial

Figure 2



measurements made on sample lakes for a class are expanded to population estimates based on the water surface area of all the lakes in the class.

Boaters on the sample lakes are surveyed to gather information about their behavior and perceptions. In 2001, surveys were conducted using in-person, hand-off and mail-back surveys at public launch facilities and at commercial accesses (resorts and private campgrounds). Riparian residents on the sample lakes were surveyed by mail. Riparian resident names and addresses were gathered from property records. Surveys are conducted on both weekdays and weekends and holidays. To ensure that the opinions of one group of boaters are not over- or under-represented when combined with another group, survey results are weighted by the contribution of each group to boating use. Survey results are

weighted by all the combinations of lake class (four classes listed above), means of access (public access, commercial access and riparian resident) and days of the week (weekdays and weekend/holidays).

In 2001, eight weekend/holiday flights and four weekday flights were conducted for the sample lakes during the period from Memorial Day weekend to Labor Day. In addition to the sample lakes, the reach of the Mississippi River from St. Cloud to the Stearns-Morrison County line was included in these aerial boat counts. Over the same summer period, 1456 surveys were completed, including 551 public access mail-back surveys, 336 commercial access mail-back surveys and 569 riparian resident mail surveys. In 1987, the walleye fishing opener in mid May, plus six weekend/holiday flights and six weekday flights from Memorial Day weekend to Labor Day were conducted. Overall, 3293 surveys were completed, including 355 public access interviews, 1090 public access windshield drop-off surveys, 678 commercial access mail-back surveys, and 1170 riparian resident mail surveys.

The 2001 study attempted to produce comparable data with the 1987 study for trend assessment purposes and to a large extent data are comparable. In some instances, however, some particulars precluded comparability. These are noted in the text when they are encountered.

One aerial boat count from the 1987 study was judged “unreliable,” and was not used in this study. The aerial flight on June 13, 1987 (a Saturday), produced a boat count that was double typical weekend/holiday levels in 1987 and 2001, and was 50 percent higher than the next largest count in either 1987 or 2001. The high count was high in all ways; it was high for all lakes and for all sources of boating use. The only surviving documentation of the flight is a print out from a spreadsheet.

For those wanting a more complete description of methodology, a technical document that presents the full methodology is available through the MN DNR.

BOAT NUMBERS AND SOURCES

Amount and Intensity of Boating

The central region has nearly 90,000 acres of boating water on 148 lakes (Table 1). These lakes comprise the major recreational boating and fishing waters of the region. They are the primary focus of shoreland development for tourist accommodations and residential housing. All of the lakes are over 145 acres in size and have permanent fish populations. Almost thirty percent of the total water acreage of these lakes is on just 12 large lakes. The remaining lakes are smaller and more numerous. Priority A and B lakes are distinguished from C, D and E lakes by their larger size and greater clarity. Size and clarity progressively decrease from A to B to C to D to E lakes.

Table 1

Boating lakes of the Central Lakes Study Area
(water access priority classes A, B, C, D and E)

	Number of lakes	Acres of lakes
Large lakes (all have public access)	12	24722
Priority A & B lakes with public access	46	31400
Priority C, D & E lakes with public access	61	25840
Lakes without public access (includes lakes in priority classes B to E)	29	7345
Total	148	89307

The large majority of lakes had at least minimal public access in 2001. Minimal public access is not synonymous with adequate public access. Minimal access only involves the presence of a public access launch facility, while adequate access incorporates the number, size and location of facilities, as well as facility characteristics such as good launching depth and amenities such as a dock to ease launching and landing.

Of the 148 lakes covered by the study, 119 are at least minimally accessible through free public access and 29 are not (Table 1). This represents an expansion of public access since 1987—the year of the previous boating study—when 48 lakes did not have public access (Table 2). Between 1987 and 2001 about half the lake acreage not accessible through free public access became at least minimally accessible.

Lakes with public access are used more intensively than lakes without public access (Figure 3). Within the lake classes with public access, the priority A/B lakes are used the most intensively, and the large lakes the least intensively, although the differences are not as dramatic as the difference between having and not having public access. The Mississippi River has an intensity of boating use between the lakes with public access and lakes without public access. The higher

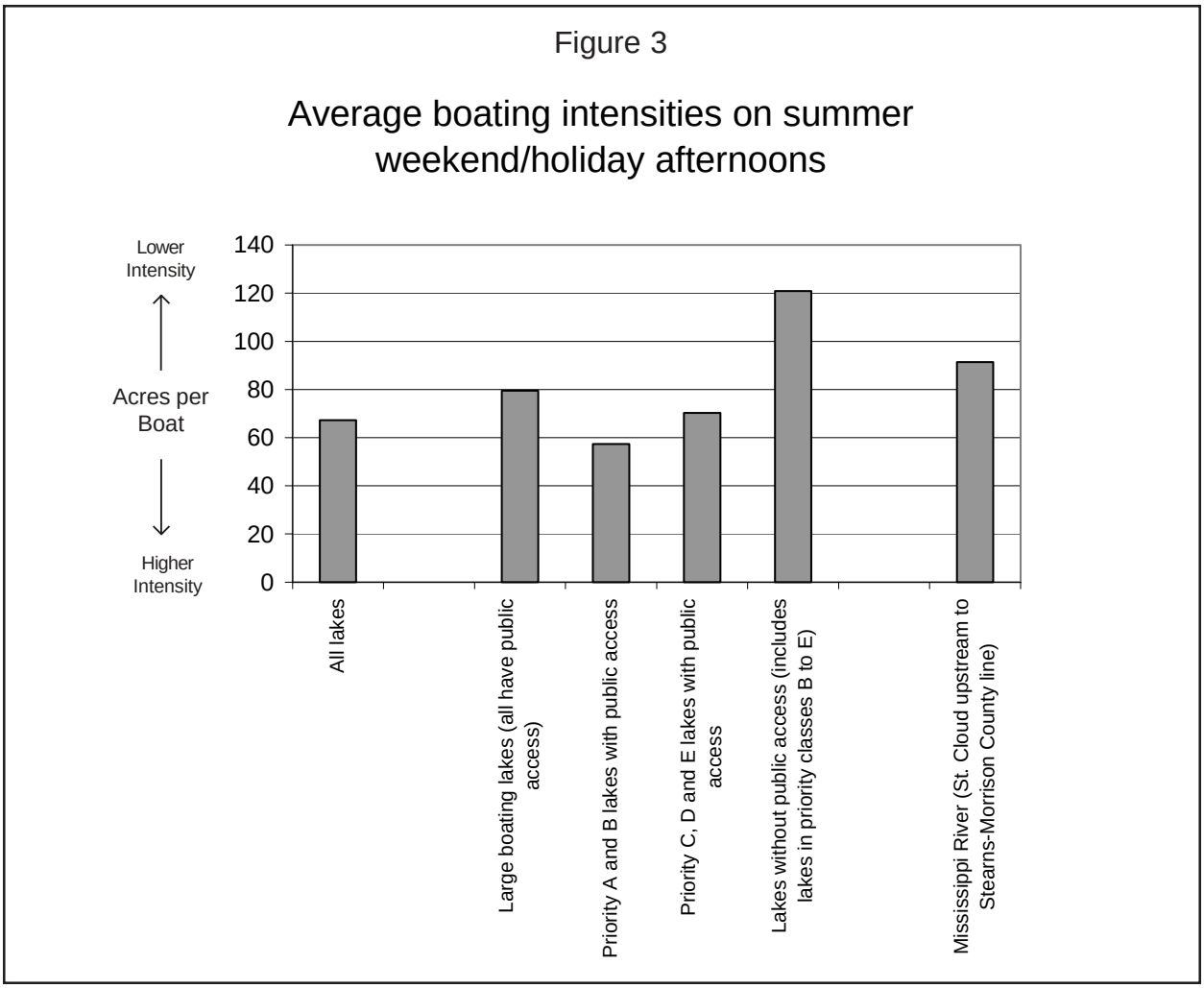
Table 2

Changes in public access status of boating lakes in the Central Study Area

(water access priority classes A, B, C, D and E)

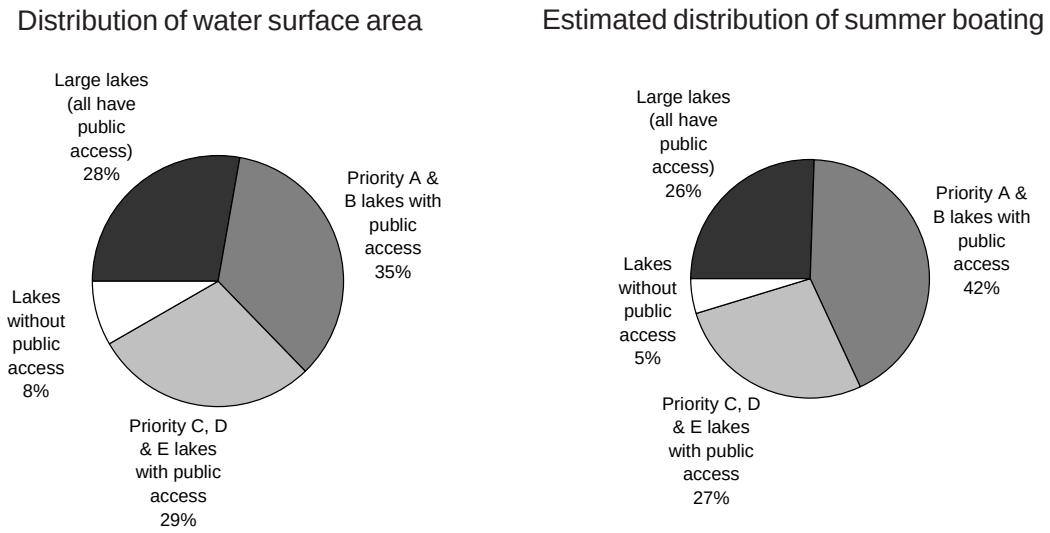
	----- Year 1987 ----		----- Year 2001 ----	
	Number	Percent	Number	Percent
Lakes with public access	100	68	119	80
Lakes without public access	48	32	29	20
Total	148	100	148	100

Figure 3



intensity of use on the priority A/B lakes translates into a higher portion of boating use (42% of use) compared with water surface acres (35% of acres) (see Figure 4). The other classes all have lower portions of boating use compared with water surface acres.

Figure 4



Weekends are the popular time to participate in boating, as well as in most outdoor recreation pursuits. A weekend or holiday, on average, has between 4 and 5 times as much boating as a weekday (Figure 5). Even though weekdays are more numerous that weekends and holidays, weekdays only account for about one-third of total boating use in the central region. In other boating studies, weekdays account for a higher portion of total boating, usually about half.

Boating intensities at peak times on weekend/holiday afternoons average about 70 acres per boat. Such a boating intensity is higher than that found in the more rural north central region, but is substantially lower (3 to 4 times lower) than that found in the Twin Cities metro area (Figure 6). Even weekdays in the metro area have intensities that exceed weekends in the central region.

Intensity of use (acres per boat as shown on Figure 3 and 6) is one dimension of boating congestion. A second dimension is the movement of boats. Moving boats, in effect, consume more area and, thus, contribute more heavily to congestion than stationary boats. The portion of moving boats is between 35 and

Figure 5

Average boating intensities on summer afternoons/early evenings

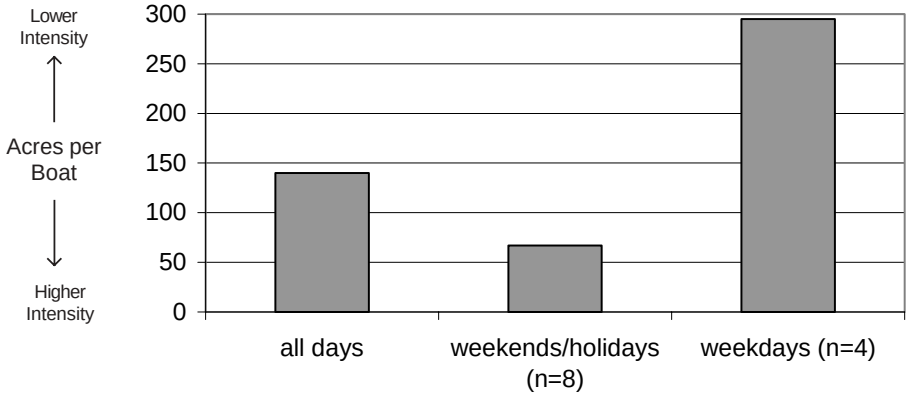
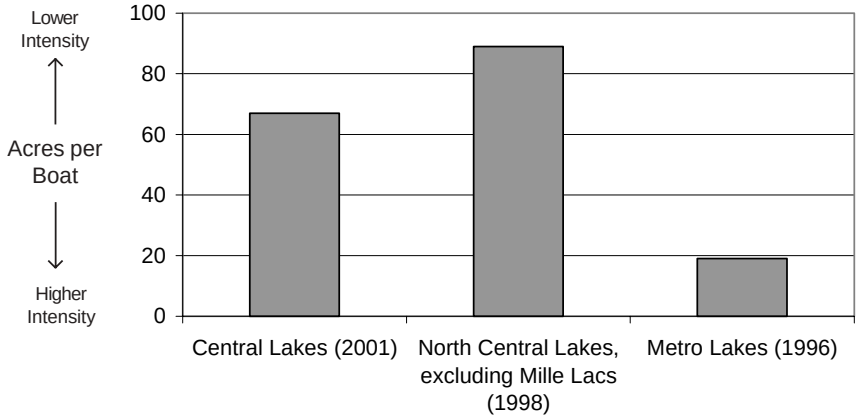


Figure 6

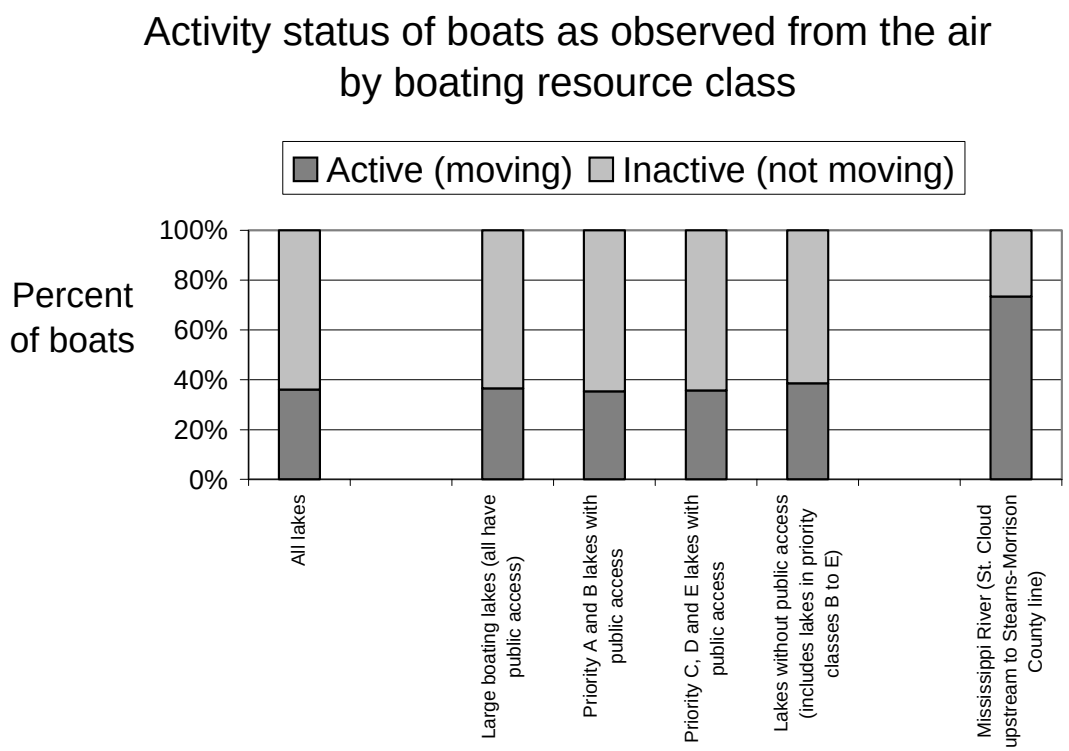
Average boating intensities on summer weekend/holiday afternoons



40 percent for all lakes classes, a portion similar to that found in the north central region (Figure 7). The portion of moving boats is substantially higher in the Twin Cities metro area (about 60 percent are moving) a factor that—in conjunction with higher boat densities—adds to the congestion of metro waters.

In contrast to lakes, moving boats comprise the large majority of boats (73%) on the Mississippi River reach, a factor that contributes to higher congestion on the River (Figure 7).

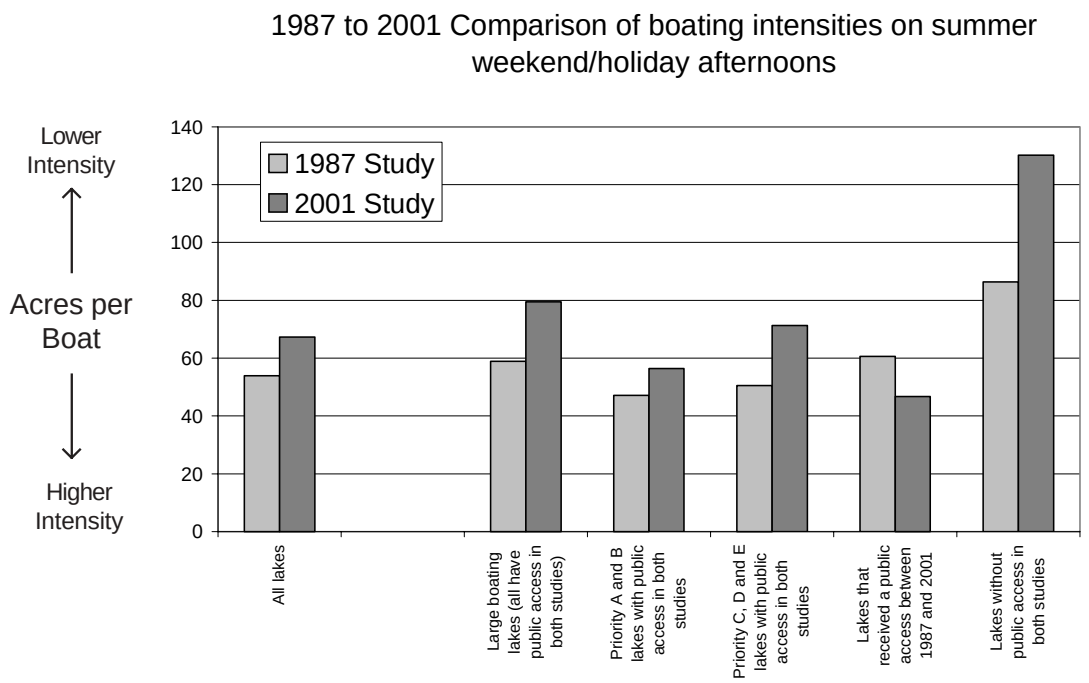
Figure 7



Changes in intensity of use from 1987 to 2001 can only be examined for weekends/holidays, because there were too few weekdays to form a valid comparison. Weekend/holiday trends by themselves, however, provide a good indication of trends in use.

The comparison of 2001 with 1987 reveals little change in boat numbers, similar to what was found between studies in the north central and metro lake regions. For lakes overall and for each boating resource class except one, the 2001 boating intensities were slightly smaller than in 1987 (Figure 8). The one exception is the group of lakes that received public access between 1987 and 2001. This group had a slightly higher boating intensity in 2001 than 1987. None of the differences on Figure 8 is statistically different (at the 5% level of statistical significance), except the one between priority C, D and E lakes with public access in both studies, which qualifies as statistically different right at the selected limit of 5%.

Figure 8



Source of Boating Use

Boaters gain access to water through three primary means:

1) public access—free public boat launches and associated parking areas.
2) commercial access—resorts, campgrounds, marinas and for-fee private accesses.
3) riparian residence—waterfront property owners.

The contributions of pubic and commercial accesses are measured directly during the aerial flights. These contributions are subtracted from the total number of boats on the water—also counted during the aerial flight—to compute a remainder, or boats from unaccounted for sources. Nearly all of the remainder is believed to derive from riparian residents. Attempts in the metro area to find any significant nonriparian sources in this remainder were not successful.

In 2001, public access contributed just under half of all boats (47%) (see Figure 9). Commercial accesses contributed another 6 percent and all other sources (mainly riparian residents) contributed the same as public accesses (47%). Public

access contributions are slightly larger on weekdays than weekends/holidays, while commercial access contributions are about the same, and the remainder (mainly riparian residents) contributions are correspondingly a smaller share on weekdays.

Figure 9

Source contributions to boats on the water by day of week

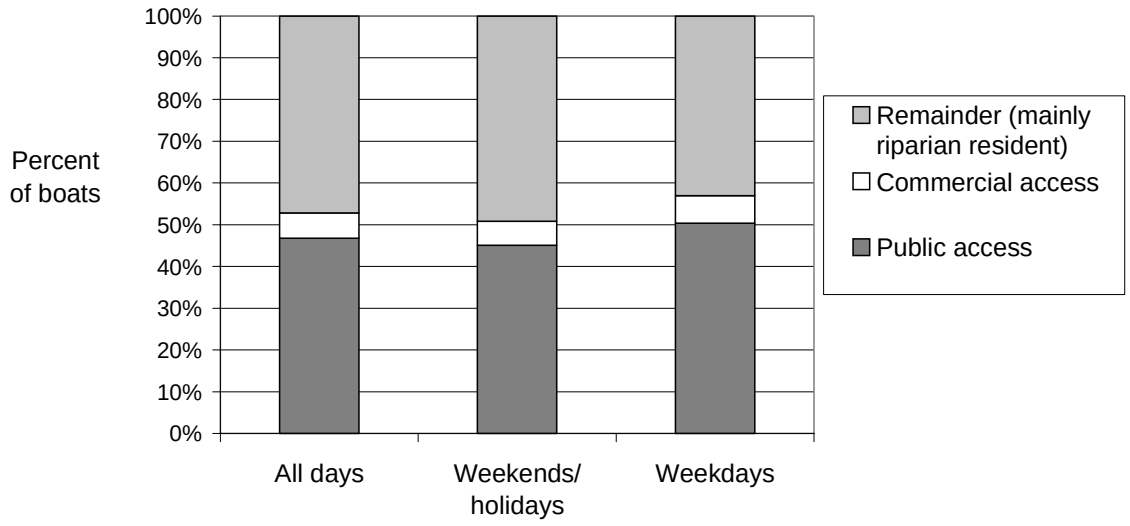
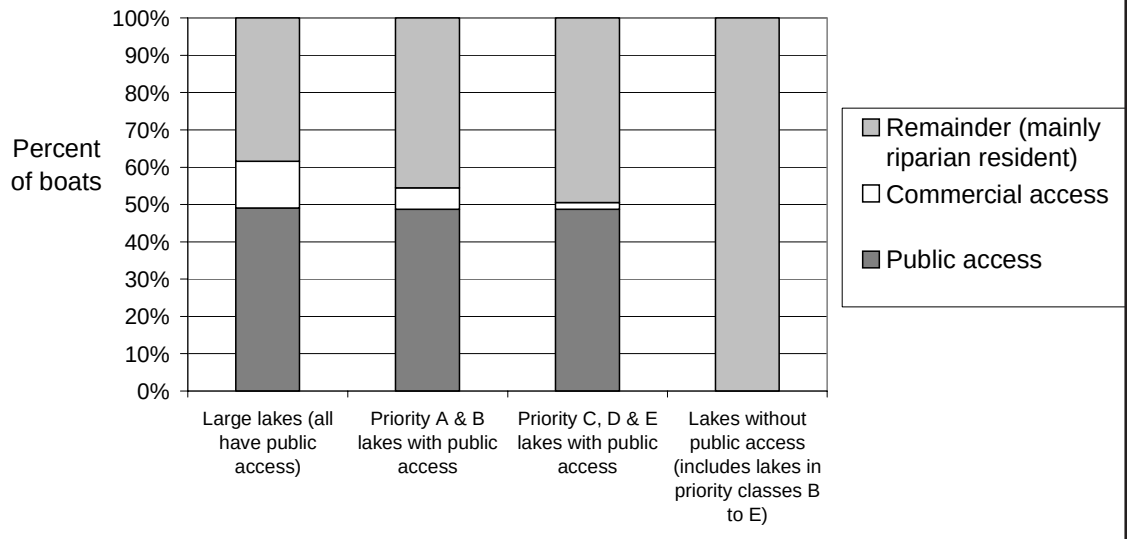


Figure 10

Source contributions to boats on the water by lake class



On lakes with public access, the public access contribution is (remarkably) 49 percent for all lakes classes; the commercial access varies from 2 to 13 percent between lake classes, and the remainder varies from 38 to 50 percent (Figure 10). On lakes without public access, the remainder category (mainly riparian residents) contributes all boating use

Between 1987 and 2001, the weekend/holiday contributions of public accesses, commercial accesses and all other sources (mainly riparian residents) showed little change (Table 3). In the north central and metro boating studies, the pattern of source change was different: public access contribution went up, commercial access contribution went down, and the riparian resident contribution stayed about the same.

Table 3

Change in source of boats on weekend/holiday afternoons, 1987 to 2001

Source	1987 study (percent)	2001 study (percent)
Public access	45	45
Commercial access (e.g., resorts, marinas)	8	6
All other sources (mainly riparian residents)	47	49
Total percent	100	100

THE BOATING EXPERIENCE

Trip Satisfaction

Trip satisfaction tends to be high for recreators who willingly engage in an activity under conditions with which they are familiar. Boaters in this central region study fit this profile for high trip satisfaction. Regarding familiarity, boaters, as a group, are familiar with the lakes at which they were surveyed. Half have been boating for 11 or more years on the lake, and only 13 percent were recent arrivals to the lake (Table 4).

Table 4

How many years have you been boating on this lake?
("this lake" is the lake at which the boater received the survey)

	Median years	Percent new boaters (one year or less)
All boaters	11	13
Source of boater:		
Public access	7	22
Commercial access	8	21
Riparian resident	17	3

Boaters are relatively satisfied, too. Just over 40 percent of all boaters report being "very satisfied" with their outing, while another 46 percent report being "satisfied" (Figure 11). Only 13 percent are "dissatisfied" to any extent. Satisfaction is as high on weekends/holidays as on weekdays. Riparian residents exhibit the highest levels of satisfaction among the sources of boaters, and seasonal residents have higher levels than permanent residents. Satisfaction also tends to be high across the different classes of lakes, although it is lower for the priority C, D and E lakes with public access (Figure 12).

The lower satisfaction for this latter lake class—as well as for public and commercial access boaters as compared with riparian residents—is associated with a higher prevalence of angling for the lake class and for these sources of boaters, coupled with the fact that anglers as a group report substantially lower levels of satisfaction with their trips than other boaters. (Figure 13). The reason for angler dissatisfaction was examined in the north central region study. Dissatisfaction was due to fishing quality (e.g., "poor fishing", "caught no/few fish", "no fish to catch") and the behavior of other boaters (e.g., "jet skis", "high wakes", and "incompetent boaters").

Figure 11

Overall, how satisfied or dissatisfied were you with your boating experience on this trip?

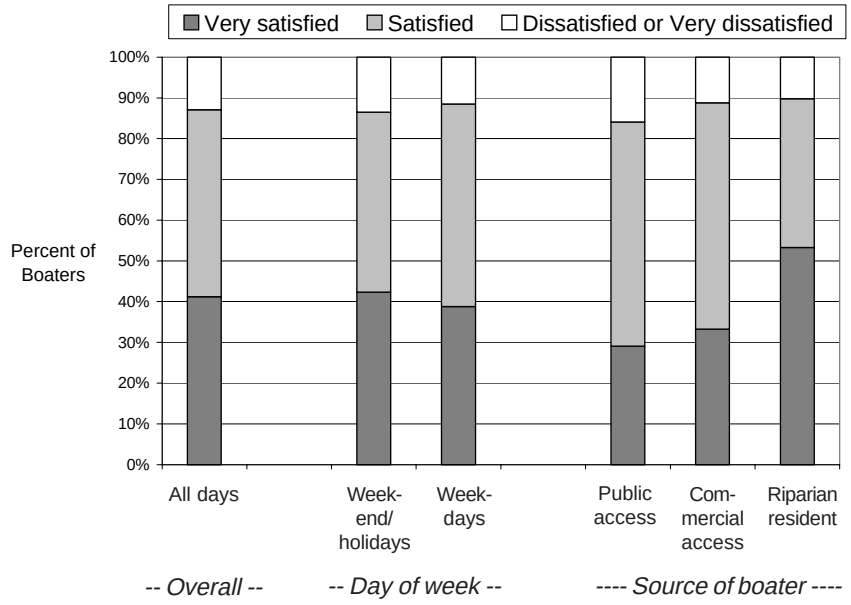
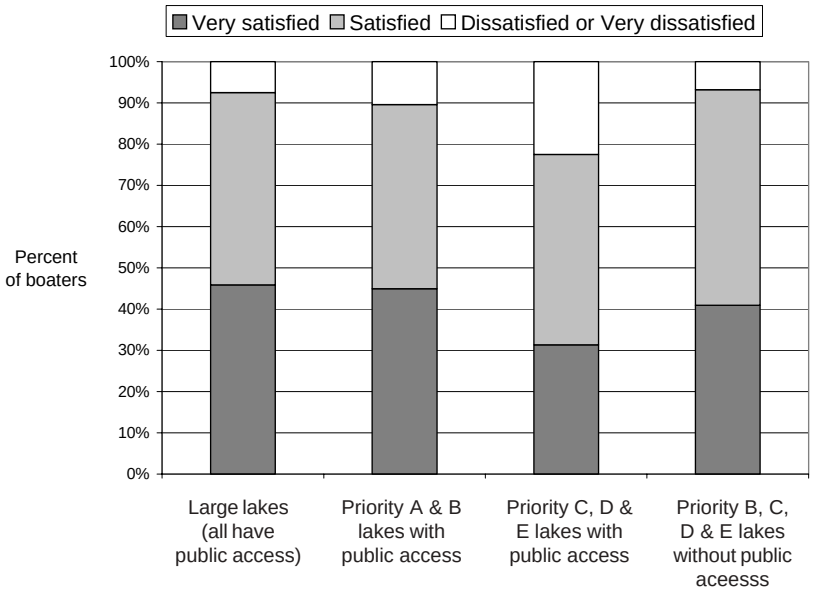


Figure 12

Overall, how satisfied or dissatisfied were you with your boating experience on this trip?



As noted above for anglers, trip satisfaction is contingent on the behavior of other boaters. In another part of the survey, boaters were asked what problems they encountered with other boaters on their trip. When the number of problems with other boaters becomes sufficient in number and severity, trip satisfaction drops. A few problems (1 to 5) of "moderate" or greater severity has little effect on trip satisfaction; but more problems of this same severity noticeably lowers trip satisfaction (Figure 14). More is said about specific problems in the next section of this report.

Figure 13

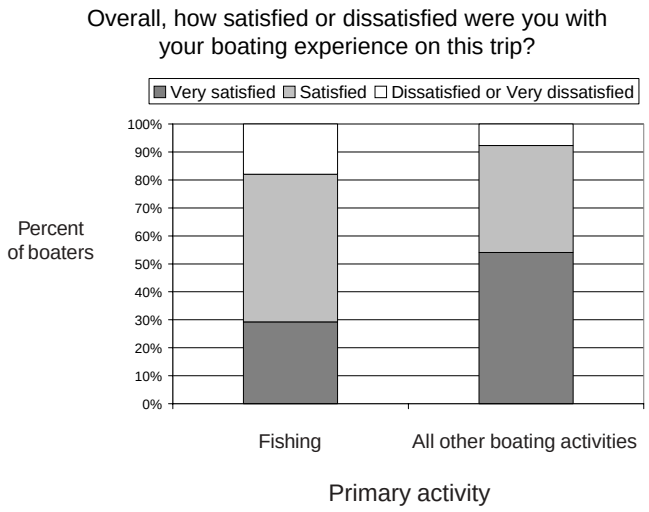
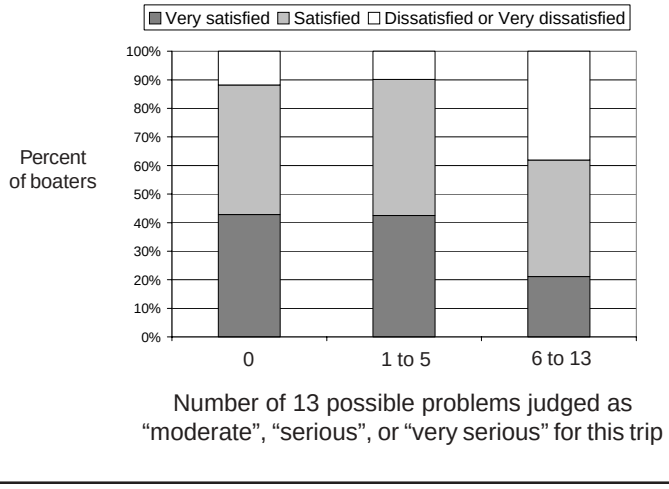


Figure 14



Trip satisfaction is also affected by perceptions of crowding. When people judge the number of boats on the lakes as "too many" their overall satisfaction declines (Table 5). Crowding is discussed more fully below following the next section on problems encountered with other boaters.

Crowding and problems with other boaters definitely lower trip satisfaction, but it is important to keep one point in mind: satisfaction still out weighs dissatisfaction even for boaters who experience these crowded conditions and problems with other boaters.

Table 5

Overall, how satisfied or dissatisfied were you with your boating experience on this trip?

	All boaters (percent)	Boaters who encountered too many boats (percent)	Boaters who *did not* encountered too many boats (percent)
Very satisfied	41	31	43
Satisfied	46	52	44
Dissatisfied	11	14	10
Very dissatisfied	2	3	2
Total	100	100	100

Problems with Other Boaters

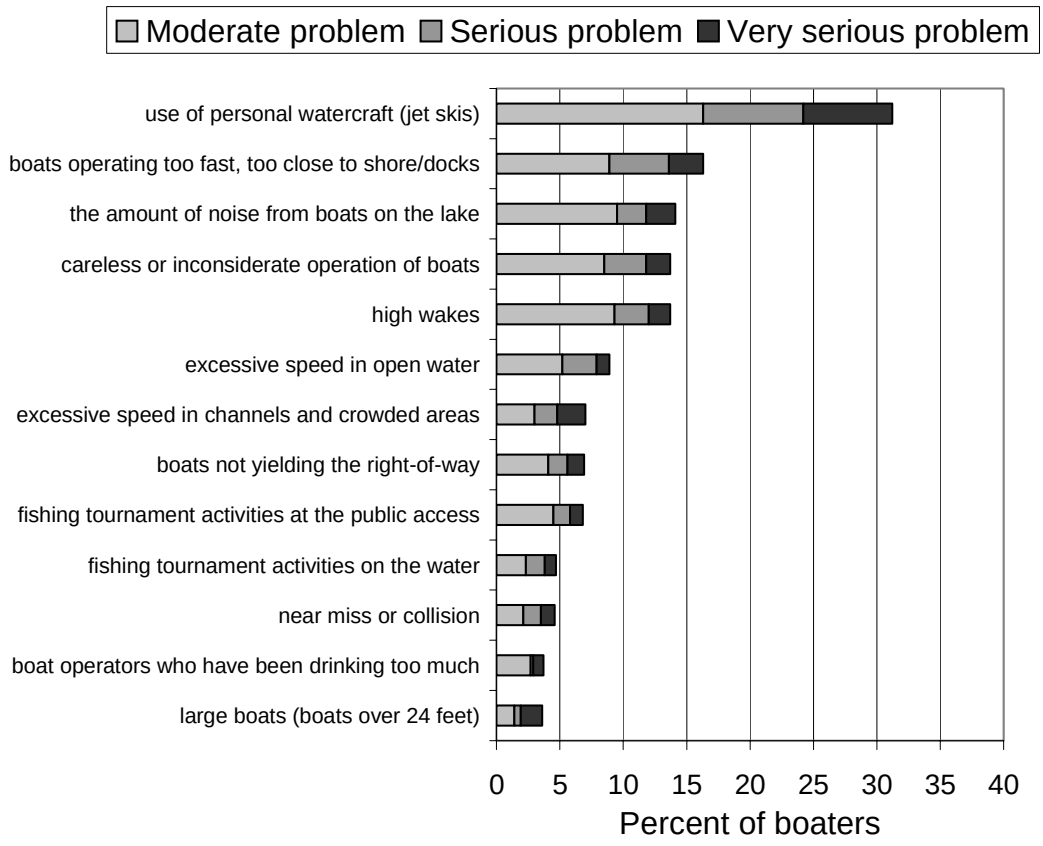
Boaters were asked to judge whether they experienced problems with other boaters on their trip. Of the 13 potential problems, none was judged by a majority of boaters as a "moderate", "serious" or "very serious" problem (Figure 15). Although not judged by a majority of boaters as a "moderate" or greater problem, one problem was clearly reported as the largest problem: "use of personal watercraft (jet skis)." It received 31 percent "moderate" or more serious responses, and it was the only problem with elevated numbers of "serious" and "very serious" responses. The next most frequently indicated problem was boats operating too fast/close to shore/docks, followed by noise, careless/inconsiderate boat operation, and high wakes. The remaining eight behaviors of other boaters were judged by fewer than 10 percent of boaters as a "moderate" or more serious problem.

The pattern of problem identification displayed on Figure 15 is widely shared among the different sources of boaters (public access, commercial access and riparian resident) and across the different lake classes. The pattern is also shared with the north central and the metro lake regions. In all regions, the "use of personal watercraft (jet skis)" is far and away the leading problem.

Experiencing problems caused by other boaters makes boaters feel more crowded (crowding is the next topic below). When other boaters get "close" enough to

Figure 15

Problems judged by boaters as "moderate", "serious", or "very serious"



cause a “moderate”, “serious” or “very serious” problem, the likelihood of encountering “too many boats” on the trip goes up (Table 6). For example, for boaters who judged “boat operators who have been drinking to much” as a “moderate” or more serious problem, 51 percent encountered “too many boats” on their trip, compared with only 9 percent who encountered “too many boats” and judged this problem as “slight” or nonexistent. Overall, boaters were some 24 percent more likely to have encountered “too many boats” if they judged a problem caused by another boater as of “moderate” or greater seriousness.

Table 6

Effects of problems with other boaters on a boater encountering "too many boats"
(numbers in table are: percent of boater encountering "too many boats")

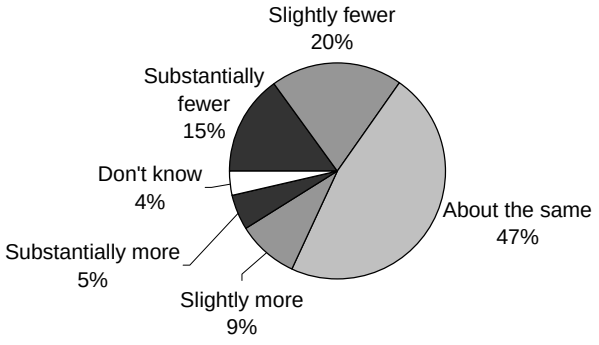
Item concerning other boaters	**A** Percent encountering "too many boats" ***when*** item judged as "moderate", "serious", or "very serious" problem	**B** Percent encountering "too many boats" ***when*** item judged as "slight", or "not a" problem	**A - B** Difference (A minus B)
boat operators who have been drinking too much	51	9	42
near miss or collision	49	11	38
boats not yielding the right-of-way	44	11	33
high wakes	38	9	29
excessive speed in channels and crowded areas	39	10	28
boats operating too fast, too close to shore/docks	36	8	28
large boats (boats over 24 feet)	38	12	26
excessive speed in open water	36	11	26
careless or inconsiderate operation of boats	34	10	24
the amount of noise from boats on the lake	29	10	19
use of personal watercraft (jet skis)	21	9	11
fishing tournament activities at the public access	22	12	11
fishing tournament activities on the water	16	13	3

Crowding

As noted above, boaters have a good deal of familiarity with the lake on which they are boating. This familiarity gives boaters a sound basis for judging “usual” or “normal” boating conditions for the time they choose to boat. When asked to judge the number of boats encountered on their current trip against this “usual” number, the largest group (47%) indicated the number was “about the same”, another 29 percent indicated either “slightly fewer” (20%) or “slightly

Figure 16

How does the number of boats you encountered on this trip compare to the number of boats you have seen on other trips on this same part of the lake?*
(percent of boaters)



* Excludes the 6% of boaters who have not visited this lake before.

more" (9%), and 20 percent indicated either "substantially fewer" (15%) or "substantially more" (5%) (see Figure 16). Overall, some 76 percent of boaters had their "usual" expectations largely met ("about the same" plus "slightly more/ fewer" responses).

A boater's comparison of "usual" number of boats with boats encountered on this current trip has a strong influence on their perception of congestion and crowding on the lake (Table 7). When the number of boats encountered today versus usual is "substantially fewer" or "slightly fewer", only a small portion of boaters indicate they encountered "too many boats" on the trip (1 to 7%), and an equally small portion indicate that the lake is "crowded" or "far too crowded" (1 to 7%). When the number encountered today rises to "slightly more" and "substantially more", perceptions of congestion and crowding increase markedly. A majority of boater who encountered "substantially more" boats than usual find "too many boats" on the lake (63%) and "crowded" or "far too crowded" conditions (83%).

Table 7

Effect of "usual" boat-number expectations on perceptions of congestion and crowding

	Percent of boaters who encountered "too many" boats today	Percent of boaters who judged the number of boats as "crowded" or "far too crowded" today
All boaters	13	14
Number of boats today versus usual?		
Substantially fewer	1	1
Slightly fewer	7	7
About the same	11	12
Slightly more	37	37
Substantially more	63	83
Don't know	0	0
Have not boated here before	3	8

Most boaters (87%) did not encounter "too many boats" on their trip, while the balance (13%) did (Figure 17). The prevalence of encountering "too many boats" did not vary substantially by day of week (weekend/holiday or weekday) or by the source of the boater (public access, commercial access, or riparian resident). Nor did the prevalence vary greatly among the lake classes with public access (Figure 18). The prevalence was, however, larger for the lakes without public

access. The reason for this difference is not known. Boaters on these lakes without public access did not follow the two patterns (identified above) that are associated with higher perceptions of crowding and congestion. They neither were more likely to encounter more boats than usual compared with boaters on other lake classes, nor did they experience more problems with other boaters compared with boaters on other lake classes. Also, this difference was not evident in 1987 (see Table 8 on trend in crowding responses). And boating intensities (density of boats on the water) are actually smaller on lakes without public access. One factor that may have contributed to this difference is the small sample size for this lake class (number of surveys is 86).

The pattern of responses described above for "too many boats" is largely the same as the pattern for

Figure 17

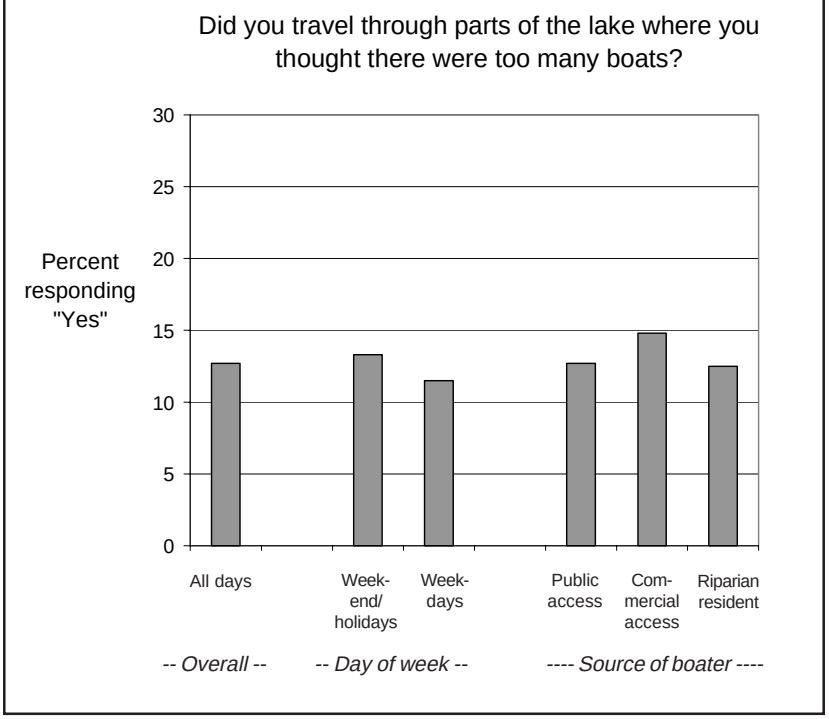
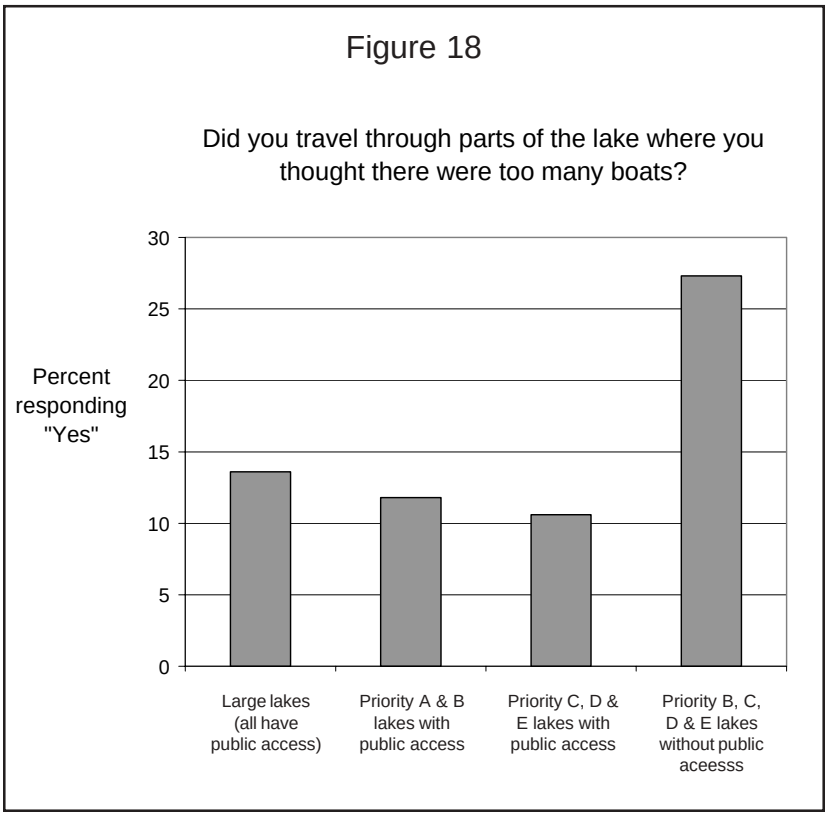


Figure 18



"crowded" and "too crowded responses" across days of week, sources of use (Figure 19) and lake classes (Figure 20). Of the crowded responses, most are reported as "crowded" and few as "far too crowded."

There has been a modest increase in perceptions of crowding between 1987 and 2001 (Table 8). Overall, 4 percent more boaters judge conditions as "crowded" or "far too crowded" in 2001 than in 1987. Increases are recorded for each source of use and for each lake class. The increase is quite large for lakes without public access. These same lakes, however, were similar in boater crowding to other lakes in 1987. A large increase occurred between 1987 and 2001. As noted above, the reason for this increase is not known, but it may be associated with the small sample size (number of surveys) representing this lake class in 2001.

Figure 19

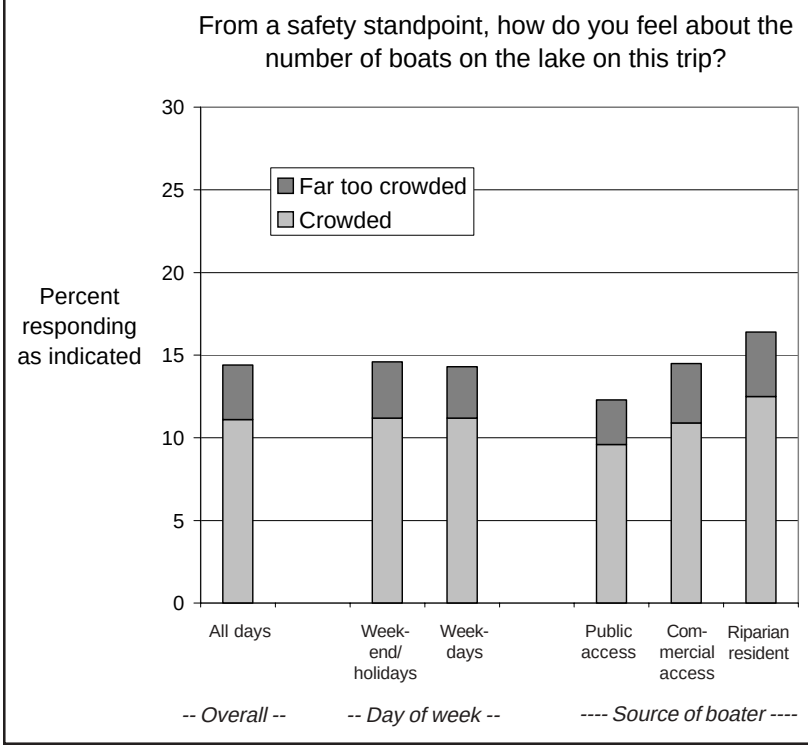


Figure 20

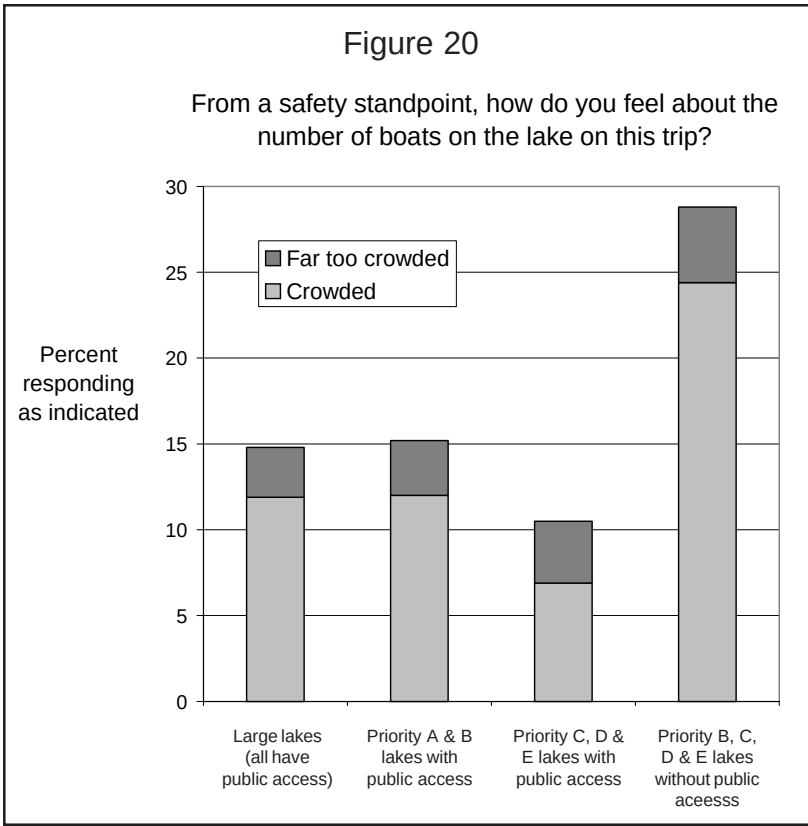


Table 8

Trends in perception of crowding: percent of boaters judging conditions as "crowded" or "far too crowded"

	"Crowded" or "Far too Crowded" 1987	"Crowded" or "Far too Crowded" 2001	Change (1987 to 2001)
Overall	10	14	4
Source of boater			
Public access	7	12	5
Commercial access	7	15	7
Riparian resident	14	16	3
Lake class			
Large lakes with public access in both study years	8	15	6
Priority A & B lakes with public access in both study years	13	15	2
Priority C, D & E lakes with public access in both study years	8	11	3
Lakes that received a public access between 1987 and 2001	10	13	3
Lakes without public access in both study years	12	29	17

The increase in perceptions of crowding is smaller than that experienced in the north central region. Both regions, however, end up in recent years with 14 to 15 percent of boaters reporting conditions as “crowded” or “far too crowded.” The north central region started from a lower crowding base in the 1980s. In the metro lake region, crowding increased an amount similar to that of the central region.

The rise in perception of crowding in the central lake region occurred over a period of time when boat numbers on the lakes were largely stable. To reiterate from a previous discussion, boaters can feel crowded for reasons other than the sheer number of boats. When boaters encounter problems with other boaters, they are more likely to feel crowded. It may be that more problems with other boaters (such as personal watercraft; larger, faster-moving boats; more noise) are giving rise to more perceived crowding. Personal watercraft are far more prevalent now than in the 1987 study, boats are larger and more powerful than in 1987 (see section below on boating equipment) and more boaters are engaging in boat riding and fewer in fishing than in 1987 (see section below on boating activities).

It may be that the combination of these changes has—at a minimum—contributed to the increase in crowding perceptions.

Irrespective of their perception of the number of boats, the large majority of boaters would return to boat under the same conditions (Table 9). Virtually all boaters (96%) who did not encounter too many boats would return if the numbers would be the same. This return rate falls to 75 percent for boaters who encountered too many boats, leaving 25 percent who would think twice before returning.

Table 9

Would you boat again if you knew there were going to be about the same number of boats as on this trip?

	All boaters (percent)	Boaters who encountered "too many boats" (percent)	Boaters who did not encountered "too many boats" (percent)
Yes	92	75	96
No	4	14	1
Don't Know	4	11	2
Total	100	100	100

PUBLIC ACCESS FACILITIES

Quality of Facilities

Boaters give high marks to public access facilities. Positive ratings ("good" to "excellent") comprise about 70 percent of boater ratings (Figure 21). Few boaters give negative ratings of "poor" or "very poor." High ratings extend across the lake classes. The current high ratings represent a small improvement over the 1987 ratings.

There are problems, however, in the use of the public access facilities. Nearly 25 percent of public access boaters indicated that they had some type of problem using the public access (Figure 22). These problems have a noticeable effect on access ratings (Table 10). Encountering a problem substantially lowers the positive ratings, and raises the middling and poor ratings.

Access users identified specific problems. The leading problems have to do with the perceived small size of many parts of the access facility: insufficient parking spaces, insufficient number of launch lanes, and not enough maneuvering room on land/water near the ramp (Figure 23). Related problems deal with competition for space with non-boaters: "access parking lot being used by non-boaters", and "swimmers near ramp made it difficult to launch/land a boat." In short, access users are feeling cramped for space. Perhaps, the increases in sizes of boats and motors contributes to these demands for more space (see following section on trends in equipment).

None of these access problems, however, was all that common. The top-ranked problem was identified by less than 10 percent of access users (9%), and only three problems were identified

Figure 21

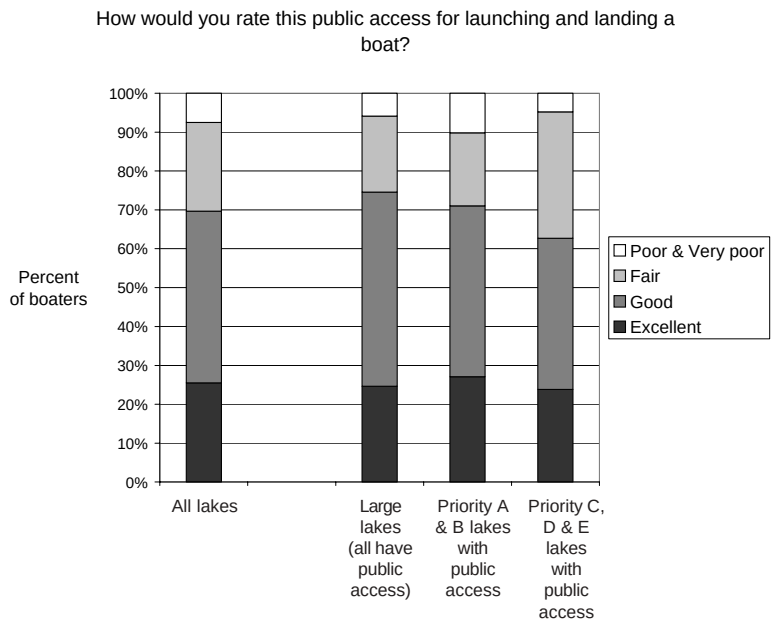


Figure 22

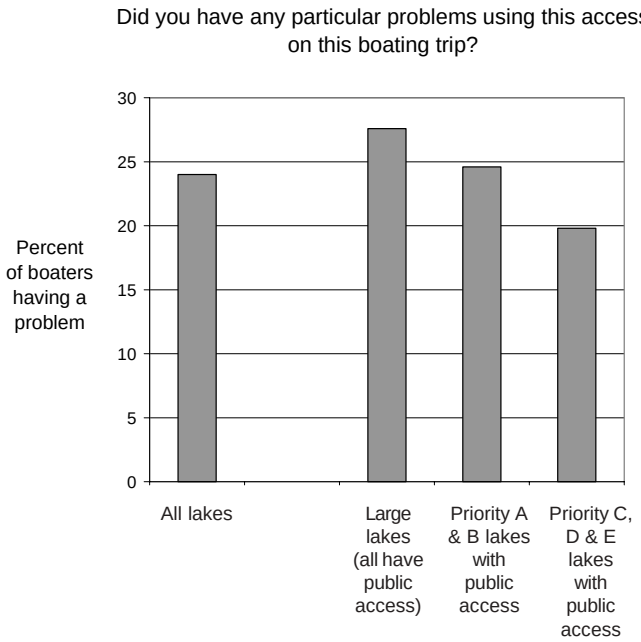
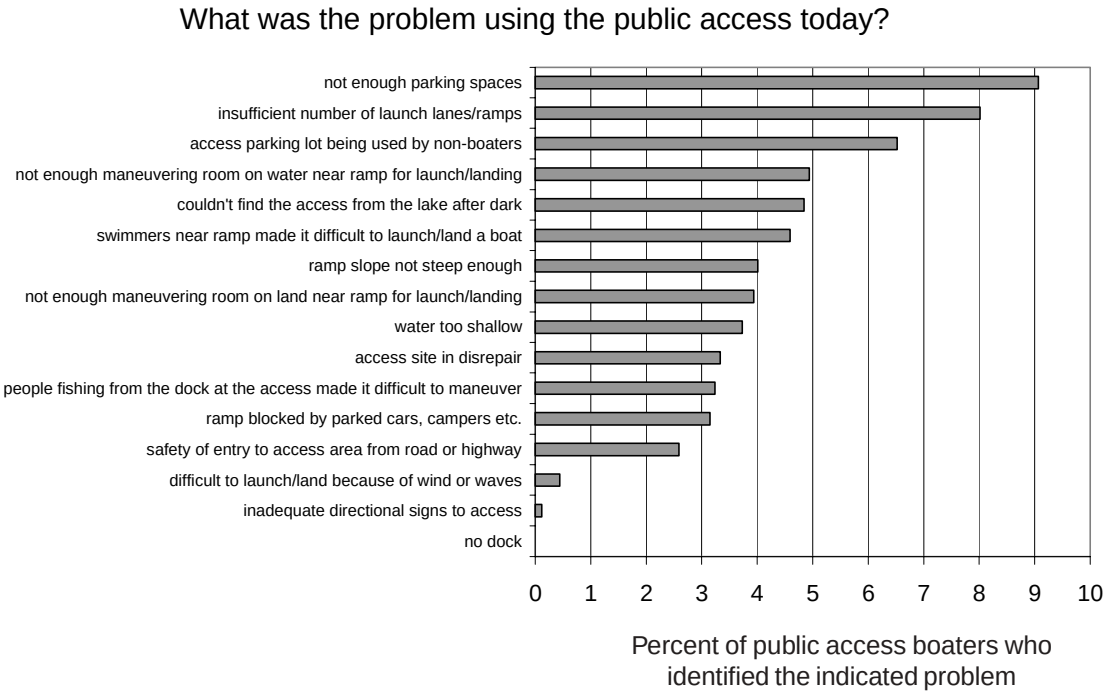


Table 10

How public access ratings are affected by problems in the use of the access

	All users (percent)	*Problem using this access?* "Yes" (percent)	"No" (percent)
Excellent	26	8	32
Good	44	24	49
Fair	23	47	16
Poor & Very poor	7	22	3
Total	100	100	100

Figure 23

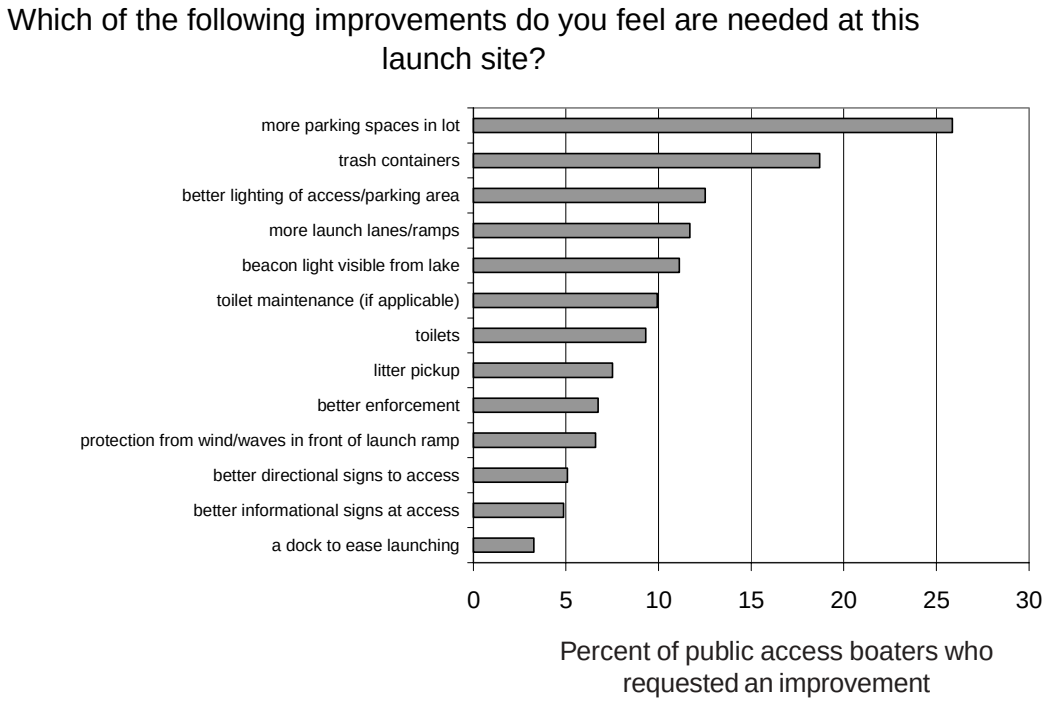


by more than 5 percent of users. But, as noted above, experiencing a problem significantly lowers boaters' ratings of access facilities.

Improvements to Facilities

When asked what improvements are needed at access sites, boaters suggested improvements that solve their use problems. The top-ranked improvement had to do with expanding the size of the facility: more parking spaces in the lot (37% of users) (see Figure 24). This was accompanied by another high-ranked, size-related improvement calling for more launch lanes/ramps (17% or users). Other improvements suggested by over 15 percent of users included two lighting concerns, which appear to suggest that boaters desire to extend their boating trips beyond daylight hours: better lighting of access/parking area (18%), and a beacon light visible from the lake (16%). Requests for trash containers were also a top-ranked improvement (27%).

Figure 24

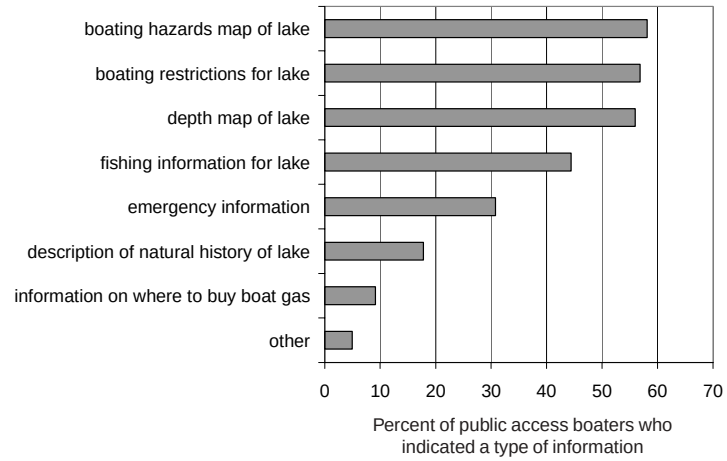


Access users were also queried about the types of information that should be available at public access sites to enhance their boating experience. The highest-ranked types of information had to do with boating safety (hazards), boating restrictions, and a depth map of the lake (Figure 25). These were the only three types reported by a majority of access users. The next ranked type of information

was fishing information for the lake, followed by emergency information. For boaters who fished on their trip, fishing information was indicated slightly more frequently. Few boaters showed interest in natural history information of the lake.

Figure 25

What types of information should be available at public boat accesses to enhance your boating experience?



Use of Facilities

In the past, nearly all public access users fit the profile of a traditional user: someone who trailers their boat to the access, launches/lands the boat at the access, and uses the access lot for parking their vehicle-trailer while they are on the water. Boaters who lived on the lake occasionally used the access to get their boat in and out of the water, especially to launch in spring and land in the fall. People staying at resorts and private campgrounds generally were not large users of the access, because most resorts/campgrounds provide their own launch facilities.

The portion of traditional users has declined (Table 11). Between 1987 and 2001, traditional users decreased from 93 percent to 82 percent of the traffic through public accesses. Accounting for more of the traffic between 1987 and 2001 are riparian residents and resort-campground guests. These latter two are now estimated to account for nearly 20 percent (18%) of traffic through the accesses, up from 7 percent in 1987. Public accesses—it appears—are becoming more and more an asset that all lake interests take advantage of, including riparian residents and commercial boating-related interests.

Table 11

Who are the users of public access?

	-- Percent of public access use -- 1987	2001
Traditional public access user	93	82
Lakeshore home owner	4	11
Resort-campground guest	3	7
Total	100	100

The decline in traditional public access users was found in the north central lake region, too. The decline was larger in the north central region, falling from 83 percent to 62 percent of traffic through public accesses between 1985 and 1998.

The reason for change in the use of public accesses is unknown, but one hypothesis comes to mind: the increasing size of boats and motors (see later section on boating equipment), and associated need to launch/land these boats at a well designed access facility. If this hypothesis is true, and if the upward trend in boat sizes and motors continues, public access facilities may become increasingly important to lakeshore residents and resorts/campgrounds on the lakes.

On a related topic, the majority of boaters (59%) use additional lakes near the lake where they were surveyed (Table 12). This includes 40 percent of riparian residents. Access to these additional lakes is dominated by public access, indicating that many more boaters than just those surveyed at public access have a stake in public access facilities (Table 13).

Table 12

Percent of boaters that boat on other lakes within 50 miles of this lake

	Percent
All boaters	59
Source of boater	
Public access	79
Commercial access	60
Riparian resident	40

Table 13

How do you gain access to these other lakes?
(a boater could check more than one means of access)

Means of access	Percent
free public access launch site	88
friend or relative's home or cabin	10
resort, marina or private launch site	10
my home or cabin	7
other	4

A large portion of public access users (53%) have at some time in their past found a public access parking lot full on the lake they were surveyed (Figure 26). On average, this happened twice (median) in the last year. Most of them were able to find a way to boat that day. They either parked on the road, went to another access on the lake, or went to another lake (Figure 27). Some 11 percent did not boat that day.

Figure 26

Have you ever tried to use a free public access on this lake and found the access parking lot full?

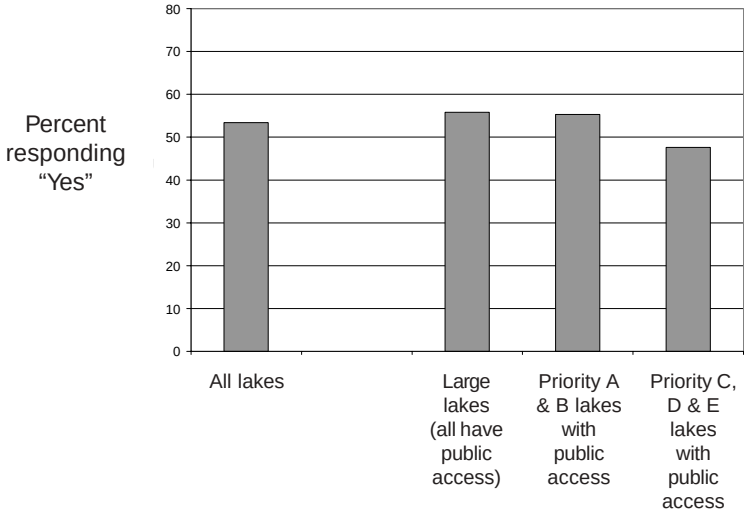
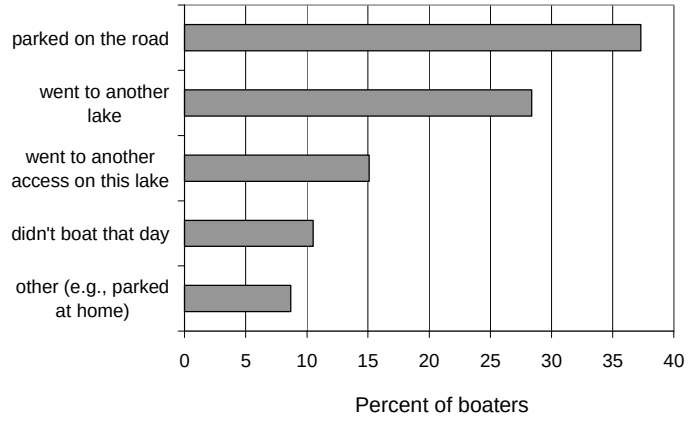


Figure 27

What did you do when you found the public access parking lot full?



Need for Additional Facilities

Full parking lots and congested facilities (noted earlier) give boaters reasons to want additional public access facilities. This want, or perceived need, for additional public access was examined in the survey in two ways: (1) for the lake at which the boaters were surveyed, and (2) for any lake within 50 miles of the lake at which they were surveyed.

For the lake at which they were surveyed, some 17 percent of all boaters though additional public access was needed, 76 percent did not think additional access was needed, and 8 percent were uncertain (Table 14). Public access boaters were more likely to indicate a need for additional access (32%), but still a majority (56%) did not see a need for more access. Few riparian residents saw a need for more access (2%). On lakes presently without public access, no boaters using these lakes (mainly riparian residents) saw a need for an access. These results are close to those found in the north central lake region.

Table 14

Do you think an additional (or initial) public access is need on this lake?

	percent of boaters			
	"Yes"	"No"	"Don't know"	Total
All boaters	17	76	8	100
Source of boater				
Public access	32	56	12	100
Commercial access	22	58	20	100
Riparian resident	2	95	3	100
Lake category				
Large lakes (all have public access)	21	69	10	100
Priority A & B lakes with public access	19	73	9	100
Priority C, D & E lakes with public access	12	83	5	100
Lakes without public access (all priority classes)	0	100	0	100

The primary reason boaters give for the need for an additional access on the lake is to relieve congestion, a concern public access users indicated when asked to describe problems they had with the public access launch facility (Table 15).

Secondary reasons had to do with the shallowness of the present access, and landing/ launching in certain types of weather.

Table 15

Why is an additional public access needed on this lake?
(reasons given by the 17% of boaters who indicated a need for more access)

Reason	Percent giving reason
present access is too congested	72
present access is too shallow	16
present access it too difficult to launch/land a boat in certain weather	16
present access is on wrong part of the lake	9
there is no access now—is needed for my use	7
present access is too far off main roads	2
other	13

Results are similar for the perceived need for additional public accesses within 50 miles of the lake at which boaters were surveyed, except that more boaters are uncertain of the need in the 50-mile radius area (expressed in the more frequent "don't know" responses). Overall, some 14 percent of all boaters thought additional public access was needed on a lake within 50 miles of where they were surveyed, 53 percent did not think additional access was needed, and 33 percent were uncertain (Table 16). Public access boaters were more likely to indicate a need for additional access on a lake within 50 miles (25%), but still a near-majority (47%)

Table 16

Do you know of a lake within 50 miles of this lake that needs an additional (or initial) public boat access?

	---------- percent of boaters ----------			
	"Yes"	"No"	"Don't know"	Total
All boaters	14	53	33	100
Source of boater				
Public access	25	47	28	100
Commercial access	11	44	46	100
Riparian resident	4	61	35	100
Lake category				
Large lakes (all have public access)	14	53	33	100
Priority A & B lakes with public access	13	55	32	100
Priority C, D & E lakes with public access	18	48	34	100
Lakes without public access (all priority classes)	0	69	31	100

did not see a need, and 28 percent were uncertain. Few riparian residents saw a need for more access on a lake within 50 miles (4%).

From these demand results, it appears that the majority of boaters, including a majority of public access boaters, feel well supplied by current public access facilities. However, a sizable proportion of public access users believe additional facilities are needed on the lake at which they were surveyed (32%) and lakes within 50 miles of where they were surveyed (25%). Relieving congestion at current facilities—a desire access users also expressed in the access improvement questions—is the primary underlying motivation for this expressed needed for additional access facilities.

BOATING SAFETY AND ENFORCEMENT

Boating Restrictions

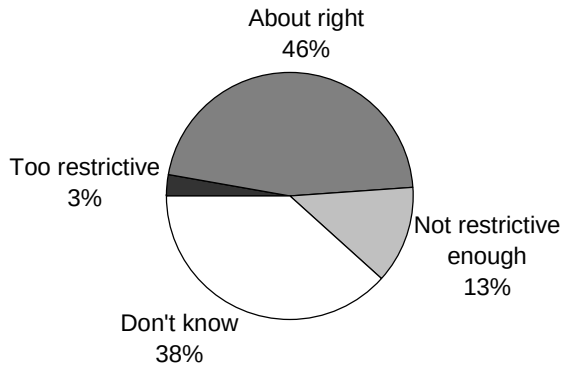
Special boating restrictions are uncommon on the sample lakes of the study. Only 4 of the 52 sample lakes had a boating restriction, and these restrictions are limited to small geographic areas; the restrictions are speed/no wake in channel areas.

When asked what restrictions exist, nearly all boaters indicated that restrictions were not prevalent. Ninety percent of boaters responded either that no restrictions existed (54%) or that they did not know about restrictions (36%). The high frequency of "don't know" responses likely indicates that boaters do not believe restrictions have been a pressing enough matter to warrant attention.

Not surprisingly, few boaters believe that the current level of restriction is "too restrictive." (Figure 28). The largest group of boaters believes the current level of restriction is "about right." Some 13 percent of all boaters believe restrictions are "not restrictive enough," while a slightly larger percent of riparian residents (17%) believed this. The high frequency of "don't know" responses indicates that the whole topic of boating restrictions is not on the radar screen of many boaters.

Figure 28

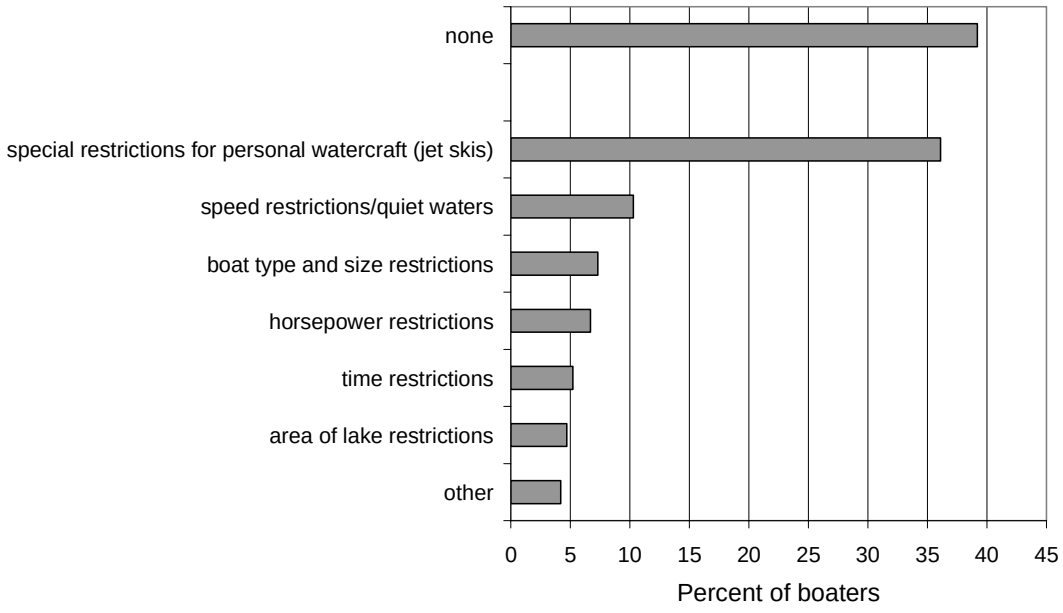
Overall, how restrictive do you think boating restrictions are on this lake? (percent of boaters)



Consistent with these responses, the most common response was "none" to the question: What special boating restrictions are needed for this lake (Figure 29)? However, a sizable portion of boaters (36%) would like to see more restrictions on personal watercraft (jet skis). This desire to restrict personal watercraft is one more indication of the opinion many boaters have of personal watercraft use. As noted above, personal watercraft use was the leading problem boaters were having with other boaters. Beyond the personal watercraft issue, few boaters think various types of boating restrictions are needed.

Figure 29

What special boating restrictions are needed for this lake?

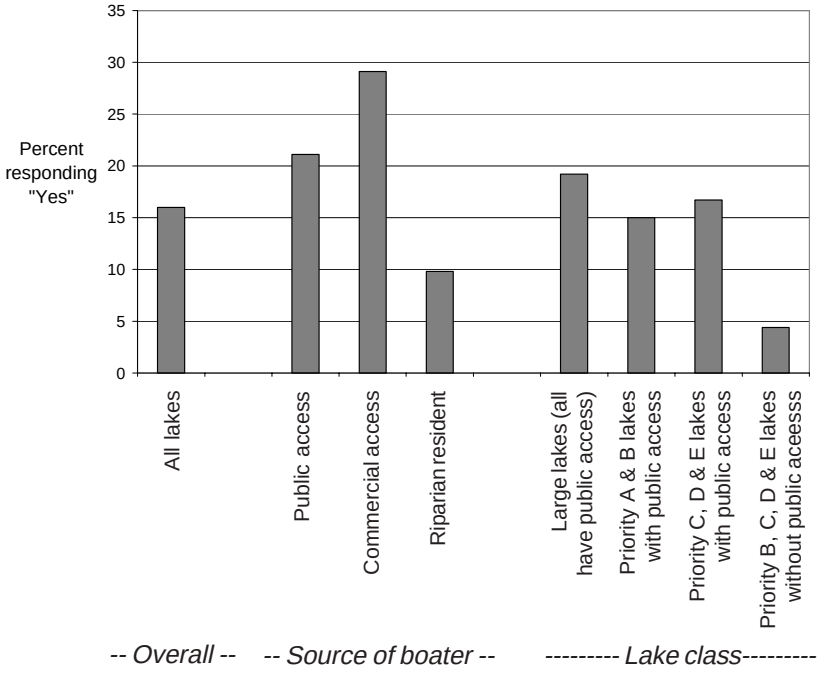


Enforcement Presence

Enforcement officers are more likely to be seen by public and commercial access boaters (Figure 30). They are less likely to be seen by riparian residents and on lakes without public access (which are used mainly by riparian resident boaters). Overall, 16 percent of boaters report seeing an officer, and this percent is little changed from 1987, when 17 percent

Figure 30

While you were on the lake on this trip, did you see an enforcement officer?

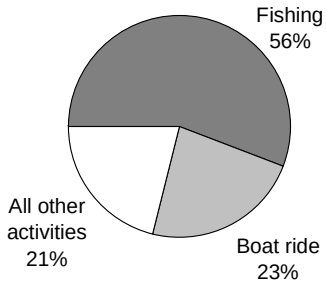


reported seeing an officer.

About six percent of boaters report being checked by an enforcement officer. Just over half of these boaters were fishing (56%), which is largely in line with the percent of *all* boaters whose primary activity was fishing (51%) (Figure 31).

Figure 31

Activity of boaters who reported being checked by an enforcement officer
(6% of boaters who reported being checked)



Boaters checked by an enforcement officer give high marks to the officer's professional conduct (Table 17). Sixty-one percent of boaters rated that conduct "excellent" and another 34 percent rated the conduct "good." Only 5 percent gave less than a positive rating of "excellent" or "good."

Table 17

How would you rate the officer's professional conduct during the check?

(responses of the 6% of boaters who reported being checked)

Rating	Percent
Excellent	61
Good	34
Fair	0
Poor	5
Very poor	0
Don't know	1
Total	100

Safety Courses

Formal safety courses have been completed by 18 percent of all boaters, very close to the percent who have completed such a course in the north central lake region (20%), but lower than the portion in the Twin Cities lake region (32%) (Table 18). Boaters using public and commercial accesses are somewhat more likely to have completed a course than riparian resident boaters. The portion having completed a course does not appear to have changed

Table 18

Boaters having completed a "course" (1987 survey) or "formal course" (2001 survey) in boating safety

	1987 (percent)	2001 (percent)	Change 1987 to 2001
All boaters	15	18	3
Source of boater			
Public access	16	23	7
Commercial access	10	13	3
Riparian resident	15	15	0

materially since 1987, but it does appear to have risen. In 1987 this question was asked without specifying the "formal" qualifier for the safety course. The "formal" qualifier probably leads to a smaller portion of boaters having completed a course.

Boaters having completed a formal safety course are more likely than other boaters (65% compared with 23%) to believe all boaters should be required to complete a safety course (Table 19). Overall, 30 percent believe all boaters should be required to complete such a course.

Table 19

Boaters who believe all boat operators (powered and unpowered) should be required to complete a boating safety course

	Percent
All boaters	30
Boaters having taken a formal safety course	65
Boaters not having taken a formal safety course	23

Requiring an operators license for motorboat operators is not all that popular. It is supported by only 21 percent of boaters (Table 20). Boaters having completed a safety course are more likely than other boaters to support this license requirement, although less than half of those having completed a safety course support the license requirement.

Table 20

Boaters who believe all motorboat operators should be required to obtain an operator's license

	Percent
All boaters	21
Boaters having taken a formal safety course	38
Boaters not having taken a formal safety course	17

The large majority of boaters agree with a different legal requirement. Concerning a legal requirement for children younger than 12 to wear a life vest while boating, nearly 70 percent either "strongly agreed" or "agreed" (Table 21). Only 14 percent either "disagreed" or "strongly disagreed."

Table 21

Do you agree or disagree that children younger than 12 years should be legally required to wear a life vest while boating?

Boater response	Percent
Strongly agree	38
Agree	31
Neutral	16
Disagree	11
Strongly disagree	3
Don't know	0
Total	100

Types of Beverages on Board

Since the 1987 study, Minnesota enacted a law that makes it illegal to operate a motorboat after consuming too much alcohol, very much like the alcohol restrictions on driving an automobile. In 2001, 21 percent of boaters report having some type of alcoholic drinks on board during their trip (Figure 32). Few have only alcoholic drinks (4%). Most boaters have no alcohol on the boat: either they have only non-alcoholic drinks on board (57%), or have no drinks of any type (24%). Riparian residents are more likely than boaters from public and commercial accesses to have no drinks on board.

Since 1987, boaters are more likely to have only non-alcoholic beverages on board, and less likely to have no drinks of any type on board (Table 22). The prevalence of alcoholic drinks is virtually unchanged since 1987.

Safety Equipment

Most boats (92%) are equipped with some form of safety equipment other than personal flotation devices (Table 23).

Figure 32

Beverages on board
(percent of boaters)

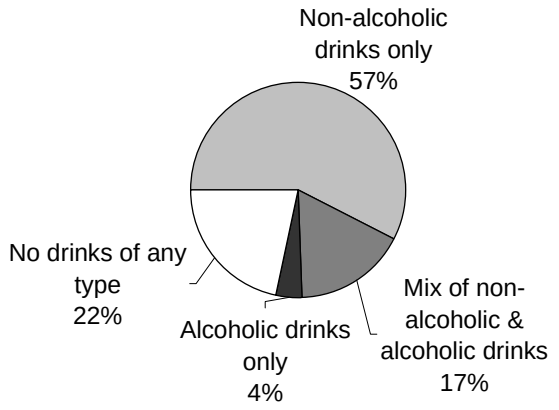


Table 22

Beverages on board, 1987 to 2001
(percent of boaters)

	1987 (percent)	2001 (percent)	Change 1987 to 2001
Non-alcoholic drinks only	49	57	9
Mix of non-alcoholic & alcoholic drinks	17	17	0
Alcoholic drinks only	3	4	1
No drinks of any type	31	22	-10
Total	100	100	0

Table 23

Percent of boats with various types of safety equipment, other than personal flotation devices

	Percent
Fire extinguisher	75
Horn	63
Lights	89
Visual signal (flag, flare gun)	12
None of the above	8

Lights, fire extinguishers and horns are the most common equipment types. The small portion of boats without any safety equipment (8%) may not need any, because no safety equipment other that personal flotation devices is required for boats less that 16 feet long operated during daylight hours.

Life jackets (personal flotation devices) were more commonly worn in 2001 than in 1987 (Table 24). Increases in life jacket use were found for all age classes of boaters and all sources of boaters. Even with these increases, however, less than half of adults report wearing a life jacket in 2001. For children, the utilization rate in 2001 is nearly 90 percent. The rise in use of life jackets is consistent with the trend found in the Twin Cities lake region between 1984 and 1996 for public access boaters.

Table 24

Trends in the percent of boat occupants wearing a life jacket (personal flotation device), 1987 to 2001

	1987 (percent)	2001 (percent)	Change (1987 to 2001)
All boat occupants	33	51	17
Source of boater:			
Public access	27	56	29
Commercial access	39	63	24
Riparian resident	37	45	8
Age of boater:			
Adults (18 or older)	24	39	15
Teens (12 to 17)	27	59	32
Children (11 or younger)	69	88	19

CHARACTERISTICS OF THE BOATING TRIP

Activity

There are two main activities on central lakes: fishing and boat riding. The former is larger than the latter for all lakes combined (Figure 33). Fishing is relatively constant by day of week, but is much larger than boat riding for public and commercial access boaters. For riparian residents, boat riding is the predominant activity. On the lakes without public access—which are dominated by riparian resident boaters—boat riding is more popular than fishing (Figure 34). All other boating activities are comparatively small. Water skiing accounts for about 7 percent of activity time.

Activities have changed since 1987. The major changes have been a sizable drop in fishing and a sizable gain in boat riding (Table 25). Notable changes of a lesser magnitude are the decrease in water skiing and the increase in “other activities.”

Figure 33

Primary boating activity

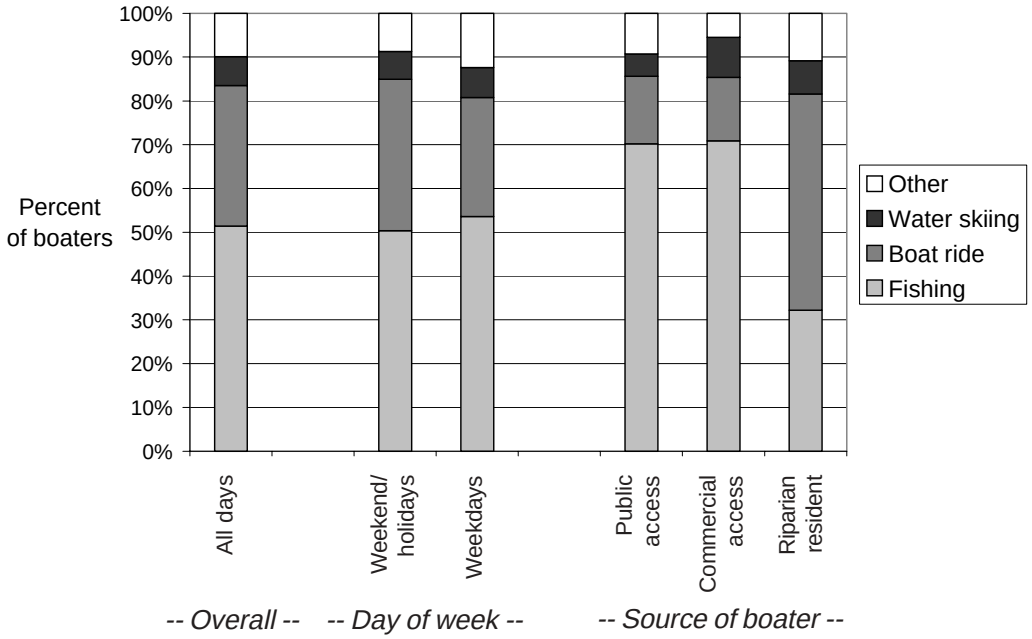
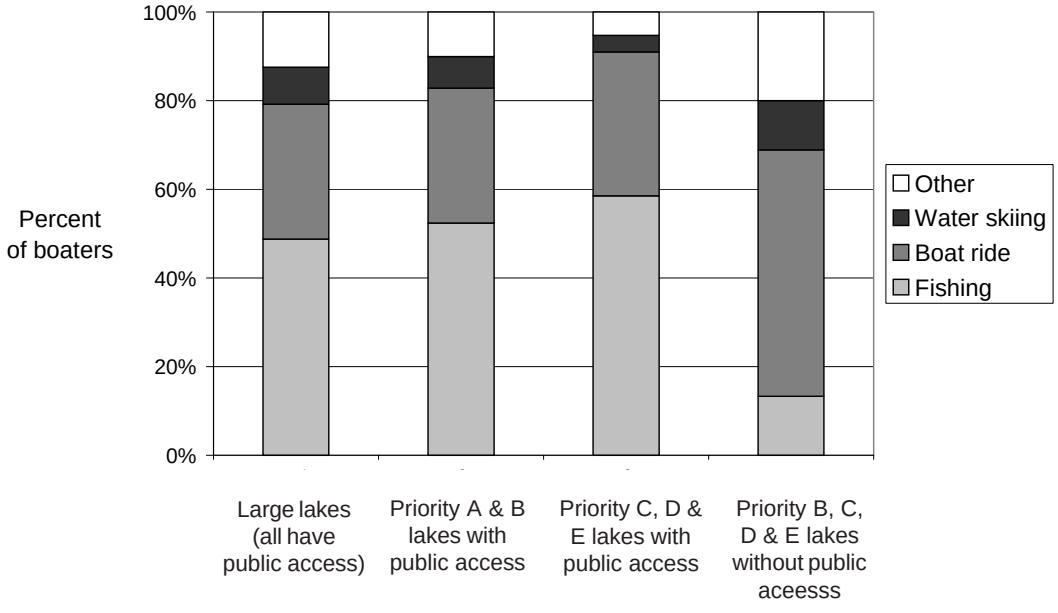


Figure 34

Primary boating activity



The "other" category includes personal watercraft use, which was not measured as a separate activity in 1987.

Personal watercraft use accounts for about 1 percent of all activities in 2001, according to the survey results. Consistent with this, about 1 percent of craft type are personal watercraft, according to survey results. However, aerial observations of craft type during the afternoon/early evening boat counts put personal watercraft use at around 7 percent of craft, much higher than the survey results. The reason for this large discrepancy is not known, and such a large discrepancy was not evident in previous studies.

Table 25

Boater activities in 1987 and 2001

	1987 (percent)	2001 (percent)	Change (1987 to 2001)
Fishing	65	51	-14
Canoeing	1	1	0
Sailing	1	1	0
Boat ride	16	32	16
Water skiing	15	7	-8
Transportation to/from	0	1	0
Other*	1	7	6
Total	100	100	0

* Includes the use of personal watercraft in 2001 (1%); personal watercraft use was not surveyed as a separate activity in 1987.

Table 26

Fishing changes, 1987 to 2001
(percent of boaters with fishing as the primary activity)

	1987 (percent)	2001 (percent)	Change (1987 to 2001)
Overall	65	51	-14
Source of boater			
Public access	81	70	-11
Commercial access	78	71	-7
Riparian resident	47	32	-15
Lake class			
Large lakes (all have public access)	68	49	-19
Priority A & B lakes with public access	64	52	-11
Priority C, D & E lakes with public access	79	59	-21
Priority B, C, D & E lakes without public access	39	13	-26

The changes experienced between 1987 and 2001 are moving the activity patterns of this region closer to that of the Twin Cities metro area, where boat riding is slightly larger than fishing. The same activity change pattern was found in the north central region between 1985 and 1998, including the drop in water skiing.

Water skiing also showed a decrease in the Twin Cities metro area between 1984 and 1996.

The fishing decrease was experienced across the board (Table 26). Each source of use and each lake class showed a drop in fishing as a portion of activity time. The boat riding increase was equally pervasive, with each source of use and each lake class showing an increase (Table 27).

Table 27

Boat ride changes, 1987 to 2001
(percent of boaters with boat riding as the primary activity)

	1987 (percent)	2001 (percent)	Change (1987 to 2001)
Overall	16	32	16
Source of boater			
Public access	4	15	11
Commercial access	8	15	7
Riparian resident	30	49	19
Lake class			
Large lakes (all have public access)	15	30	16
Priority A & B lakes with public access	17	30	14
Priority C, D & E lakes with public access	7	33	26
Priority B, C, D & E lakes without public access	36	56	20

Boating Equipment

The types of craft most used for boating in 2001 are runabouts and fishing boats, followed by pontoons (Table 28) (runabouts have a deck and windshield; fishing boats are open; a fishing boat is a type of craft, and is not related to the activity of fishing). Pontoons are more common among riparian residents, and fishing boats are more common among public and commercial access boaters. Other craft types are comparatively uncommon.

Craft types have changed since 1987. The primary changes are an increase in pontoons and runabouts (including cruisers, which were lumped with runabouts in 1987), and a decrease in fishing boats (Table 29). Secondary changes are the small decreases in canoes/kayaks and sailboats, and an increase in "other", which includes personal

Table 28

Watercraft in 2001
(craft types as reported in the boater surveys)

	Percent
Runabout (has windshield)	37
Fishing boat (no windshield)	37
Pontoon	20
Personal watercraft (jet ski)	1
Canoe/kayak	1
Sailboat	1
Cruiser (has cabin or superstructure)	0
Other	4
Total	100

watercraft, a craft type not measured in 1987. Every source of boater had a decrease in fishing boats, and an increase in pontoons. The increase in pontoons was sizable for riparian residents (from 16% to 34% of all craft between 1987 and 2001), and was accompanied by a small decrease in riparian-resident use of runabouts over the same period (from 39% to 36% of all craft).

Table 29

Watercraft trends, 1987 to 2001
(craft types as reported in the boater surveys)

	1987 (percent)	2001 (percent)	Change (1987 to 2001)
Runabout & cruiser	31	37	6
Fishing boat	58	37	-21
Pontoon	8	20	12
Canoe/kayak	1	1	-1
Sailboat	1	1	-1
Other*	1	5	4
Total	100	100	0

* Includes personal watercraft in 2001 (1%); personal watercraft were not surveyed as a separate type of craft in 1987.

Boat lengths now average around 17 feet, and are relatively constant across sources of boaters and lake classes (Table 30). Motor sizes average 75 horsepower; the median is lower at 55 horsepower. Boat lengths and motor sizes are smaller than those found in the north central lakes and Twin Cities metro region. Lengths are, on average, about a foot shorter and motor sizes about 25 horsepower smaller.

Table 30

Boat lengths and motor sizes

	Average feet	Median feet	Average horsepower	Median horsepower
Overall	17	17	75	55
Source of boater				
Public access	17	17	77	60
Commercial access	16	16	58	50
Riparian resident	18	17	74	50
Lake class				
Large lakes (all have public access)	17	17	86	70
Priority A & B lakes with public access	17	17	71	50
Priority C, D & E lakes with public access	17	17	67	40
Priority B, C, D & E lakes without public access	18	18	95	79

Most craft have motors (Table 31). Only about 2 percent are non motorized. The most common craft has one gas-burning motor. Craft with two motors are not uncommon, however, and represent 41 percent of all boats. Two-motor combinations are more likely to be gas with electric than two gas motors.

Table 31

Type and mix of motors on boats

	Percent of boats
One motor	
Gas	56
Electric	1
Subtotal	57
Two motors	
Gas & electric	37
Gas & gas	4
Subtotal	41
No motors	2
Total	100

Both craft length and motor sizes have shown increases since 1987 (Table 32). Lengths are up a foot or two across the board, and motor sizes, too, are up across the board. The increase in motor size represents a 62 percent jump since 1987. An increase in motor sizes and boat lengths was also experienced in the north central and Twin Cities metro lake region.

Table 32

Trends in boat lengths and motor sizes, 1987 to 2001

	1987 Average feet	2001 Average feet	Change 1987 to 2001	1987 Average horsepower	2001 Average horsepower	Change 1987 to 2001
Overall	15.6	17.4	1.7	46.1	74.5	28.4
Source of boater						
Public access	15.3	16.8	1.5	41.8	77.3	35.5
Commercial access	15.3	16.5	1.2	35.6	58.3	22.7
Riparian resident	16.0	18.0	2.0	53.4	73.8	20.5
Lake class						
Large lakes (all have public access)	15.7	17.1	1.5	45.9	86.3	40.5
Priority A & B lakes with public access	15.6	17.4	1.8	46.9	70.8	23.9
Priority C, D & E lakes with public access	15.3	17.4	2.1	38.5	66.8	28.3
Priority B, C, D & E lakes without public access	16.1	18.1	1.9	59.1	95.1	36.1

Boater Characteristics

Boaters, as a group, are familiar with the lake at which they were surveyed. The median length of use of the lake is 11 years, and is larger for riparian residents than for public and commercial access boaters (Table 33). New boaters, who have started boating in the last year on the lake they were surveyed, are not all that common overall (13% of all boaters), but are more common for public and commercial access boaters (21% to 22% of all boaters). The percentage of new boaters among riparian residents is small (3%).

The public and commercial accesses serve two geographic markets. One is the local market (within 25 miles of home; within about a half-hour drive) and the other is the more distant "tourist" market. The former accounts for about one-half of access use (Table 34). The other market is the "tourist" market—over 50 miles or over a one-hour drive from

Table 33

How many years have you been boating on this lake?
("this lake" is the lake at which the boater received the survey)

	Median years	Percent new boaters (one year or less)
All boaters	11	13
Source of boater:		
Public access	7	22
Commercial access	8	21
Riparian resident	17	3
Lake class:		
Large lakes (all have public access)	12	12
Priority A & B lakes with public access	12	13
Priority C, D & E lakes with public access	10	14
Priority B, C, D & E lakes without public access	13	2

Table 34

Travel distance from permanent home to public and commercial accesses
("this lake" is the lake at which the boater received the survey)

	Median miles	Percent of boaters who are within 25 miles of their permanent home
All boaters	25	51
Source of boater:		
Public access	25	54
Commercial access	69	24
Lake class:		
Large lakes (all have public access)	25	52
Priority A & B lakes with public access	30	48
Priority C, D & E lakes with public access	23	57

home—and it accounts for about one-quarter of public and commercial access use. Not surprisingly, the commercial accesses (resorts and private campgrounds) predominately serve the tourist market.

The median distance boaters travel to public and commercial accesses in 2001 (25 miles) is not greatly changed since 1987, when it was 28 miles.

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APPENDIX A

Lakes in the north central study area

Sample lakes in 1987 and 2001 boating studies

Lake Number	Lake Name	1987 Category*	2001 Category*	Lake Acres
340206	Andrew	Cat 1	Cat 1	781
860284	Augusta	Cat 1	Cat 1	186
860090	Buffalo	Cat 1	Cat 1	1,510
860252	Clearwater	Cat 1	Cat 1	3,704
340079	Green	Cat 1	Cat 1	5,821
730200	Koronis	Cat 1	Cat 1	3,471
340192	Long	Cat 1	Cat 1	1,715
340251	Norway	Cat 1	Cat 1	2,496
730037	Pearl	Cat 1	Cat 1	755
860289	Sylvia	Cat 1	Cat 1	747
860279	Twin	Cat 1	Cat 1	1,012
470046	Washington	Cat 1	Cat 1	2,524
470049	Belle	Cat 2-PA	Cat 2-PA	1,035
730106	Big Fish	Cat 2-PA	Cat 2-PA	591
340086	Big Kandiyohi	Cat 2-PA	Cat 2-PA	2,877
730117	Big Spunk	Cat 2-PA	Cat 2-PA	410
470038	Big Swan	Cat 2-PA	Cat 2-PA	772
340044	Diamond	Cat 2-PA	Cat 2-PA	1,697
340171	Eagle	Cat 2-PA	Cat 2-PA	891
470002	Francis	Cat 2,3-NPA	Cat 2-PA	1,172
340224	Games	Cat 2-PA	Cat 2-PA	557
730055	Grand	Cat 2-PA	Cat 2-PA	666
730157	Horseshoe	Cat 2-PA	Cat 2-PA	995
860199	Howard	Cat 2-PA	Cat 2-PA	764
470015	Jennie	Cat 2-PA	Cat 2-PA	1,089
340066	Long	Cat 2-PA	Cat 2-PA	356
730128	Middle Spunk	Cat 2-PA	Cat 2-PA	242
470119	Minnie Belle	Cat 2-PA	Cat 2-PA	559
340154	Nest	Cat 2-PA	Cat 2-PA	1,019
730051	Pleasant	Cat 2,3-NPA	Cat 2-PA	220
860053	Pulaski	Cat 2-PA (not a	Cat 2-PA	770
730196	Rice	Cat 2-PA	Cat 2-PA	1,568
470134	Ripley	Cat 2-PA	Cat 2-PA	1,060
470068	Stella	Cat 2,3-NPA	Cat 2-PA	626
860233	Sugar	Cat 2-PA	Cat 2-PA	1,145

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Sample lakes in 1987 and 2001 boating studies (continued)

Lake Number	Lake Name	1987 Category*	2001 Category*	Lake Acres
730023	Beaver	Cat 2,3-NPA	Cat 3-PA	158
860023	Beebe	Cat 3-PA	Cat 3-PA	315
470042	Betty (Betsy)	Cat 2,3-NPA	Cat 3-PA	182
860293	Collinwood	Cat 3-PA	Cat 3-PA	637
860148	Eagle	Cat 2,3-NPA	Cat 3-PA	199
730150	Eden	Cat 3-PA	Cat 3-PA	290
340022	Elizabeth	Cat 3-PA	Cat 3-PA	1,153
470064	Erie	Cat 3-PA	Cat 3-PA	196
860273	French	Cat 3-PA	Cat 3-PA	408
860217	Granite	Cat 3-PA	Cat 3-PA	358
470062	Greenleaf	Cat 3-PA	Cat 3-PA	283
730139	Long	Cat 3-PA	Cat 3-PA	478
730123	Lower Spunk	Cat 2,3-NPA (not a sample lake in 1987)	Cat 3-PA	269
470050	Manuella	Cat 3-PA	Cat 3-PA	346
710159	Long	Cat 2,3-NPA	Cat 2,3-NPA	180
860049	Mary	Cat 2,3-NPA	Cat 2,3-NPA	331
710158	Pickerel	Cat 2,3-NPA	Cat 2,3-NPA	165
730092	Sagatagan	Cat 2,3-NPA	Cat 2,3-NPA	170

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Remaining (non-sample) boating lakes in priority classes A to E

Lake Number	Lake Name	1987 Category*	2001 Category*	Lake Acres
860212	Albion	Cat 2,3-NPA	Cat 2,3-NPA	330
710069	Ann	Cat 2,3-NPA	Cat 2-PA	226
860190	Ann	Cat 3-PA	Cat 3-PA	457
860234	Bass	Cat 2-PA	Cat 2-PA	234
730156	Becker	Cat 2,3-NPA	Cat 2,3-NPA	222
710082	Big	Cat 2,3-NPA	Cat 2-PA	241
730159	Big	Cat 2-PA	Cat 2-PA	446
710141	Big Elk	Cat 3-PA	Cat 3-PA	352
730102	Big Watab	Cat 2-PA	Cat 2-PA	233
860095	Black	Cat 2,3-NPA	Cat 2,3-NPA	208
710146	Briggs	Cat 3-PA	Cat 3-PA	406
340062	Calhoun	Cat 3-PA	Cat 3-PA	1,396
730038	Carnelian	Cat 2,3-NPA	Cat 2-PA	180
860073	Cedar	Cat 2,3-NPA	Cat 2,3-NPA	271
730226	Cedar	Cat 2-PA	Cat 2-PA	152
860227	Cedar	Cat 2-PA	Cat 2-PA	837
730133	Cedar Island	Cat 2-PA	Cat 2-PA	995
860011	Charlotte	Cat 2-PA	Cat 2-PA	245
470095	Clear	Cat 2-PA	Cat 2-PA	703
860263	Cokato	Cat 2-PA	Cat 2-PA	544
860051	Constance	Cat 3-PA	Cat 3-PA	195
340218	Crook	Cat 2,3-NPA	Cat 2,3-NPA	367
860041	Dean	Cat 3-PA	Cat 3-PA	204
860107	Deer	Cat 3-PA	Cat 3-PA	164
860178	Dog	Cat 3-PA	Cat 3-PA	249
470082	Dunns	Cat 3-PA	Cat 3-PA	151
860184	Dutch	Cat 3-PA	Cat 3-PA	218
710067	Eagle	Cat 3-PA	Cat 3-PA	426
340246	East Solomon	Cat 3-PA	Cat 3-PA	733
340115	East Twin	Cat 2,3-NPA	Cat 2,3-NPA	160
340033	Ella	Cat 3-PA	Cat 3-PA	153
860188	Emma	Cat 3-PA	Cat 3-PA	216
340217	Florida	Cat 2-PA	Cat 2-PA	801
340181	Foot	Cat 3-PA	Cat 3-PA	576
860086	Fountain	Cat 3-PA	Cat 3-PA	455
710016	Fremont	Cat 2,3-NPA	Cat 3-PA	466
340142	George	Cat 2-PA	Cat 2-PA	248
860064	Gilchrist	Cat 2,3-NPA	Cat 2,3-NPA	388
730076	Goodners	Cat 3-PA	Cat 3-PA	285
340316	Henjum	Cat 2,3-NPA	Cat 2,3-NPA	230
860213	Henshaw	Cat 2,3-NPA	Cat 2,3-NPA	277
470106	Hoff	Cat 2,3-NPA	Cat 3-PA	158
710142	Ice	Cat 2,3-NPA	Cat 2,3-NPA	187
860146	Ida	Cat 2-PA	Cat 2-PA	245
860288	John	Cat 2-PA	Cat 2-PA	506
340105	Kasota	Cat 2,3-NPA	Cat 2,3-NPA	469
730233	Kings	Cat 2-PA	Cat 2-PA	213
730064	Kraemer	Cat 2,3-NPA	Cat 2,3-NPA	200

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Remaining (non-sample) boating lakes in priority classes A to E
(continued)

Lake Number	Lake Name	1987 Category*	2001 Category*	Lake Acres
340072	Lillian	Cat 2,3-NPA	Cat 3-PA	1,608
860163	Limestone	Cat 2-PA	Cat 2-PA	373
710055	Little Elk	Cat 3-PA	Cat 3-PA	336
860134	Little Maple	Cat 2-PA	Cat 2-PA	1,013
860106	Little Waverly	Cat 3-PA	Cat 3-PA	336
860168	Locke	Cat 3-PA	Cat 3-PA	152
730107	Long	Cat 2,3-NPA	Cat 2,3-NPA	158
860069	Long	Cat 2,3-NPA	Cat 2,3-NPA	160
470026	Long	Cat 2,3-NPA	Cat 3-PA	162
860282	Louisa	Cat 2,3-NPA	Cat 2,3-NPA	183
860139	Marie	Cat 3-PA	Cat 3-PA	180
860193	Mary	Cat 2,3-NPA	Cat 2,3-NPA	196
860156	Mary	Cat 3-PA	Cat 3-PA	232
730273	Mccormic	Cat 3-PA	Cat 3-PA	211
340208	Middle	Cat 2,3-NPA	Cat 2,3-NPA	440
860229	Mink	Cat 3-PA	Cat 3-PA	304
710081	Mitchell	Cat 2,3-NPA	Cat 2,3-NPA	156
860271	Moses	Cat 2,3-NPA	Cat 2-PA	145
730151	Mud	Cat 2,3-NPA	Cat 3-PA	171
730147	North Browns	Cat 3-PA	Cat 3-PA	312
710013	Orono	Cat 3-PA	Cat 3-PA	300
730118	Pelican	Cat 2-PA	Cat 2-PA	344
860031	Pelican	Cat 3-PA	Cat 3-PA	2,793
860251	Pleasant	Cat 2-PA	Cat 2-PA	639
340193	Point	Cat 2,3-NPA	Cat 3-PA	157
860120	Ramsey	Cat 3-PA	Cat 3-PA	355
340172	Ringo	Cat 3-PA	Cat 3-PA	774
860182	Rock	Cat 3-PA	Cat 3-PA	181
470102	Round	Cat 2,3-NPA	Cat 3-PA	281
710147	Rush	Cat 3-PA	Cat 3-PA	161
340283	Saint Johns	Cat 2,3-NPA	Cat 2,3-NPA	240
730199	Sand	Cat 3-PA	Cat 3-PA	215
730035	School Section	Cat 3-PA	Cat 3-PA	183
340196	Skataas	Cat 2,3-NPA	Cat 2,3-NPA	218
860230	Somers	Cat 2,3-NPA	Cat 3-PA	156
340040	Sperry	Cat 2,3-NPA	Cat 2,3-NPA	153
470032	Spring	Cat 3-PA	Cat 3-PA	202
860208	Swart Watts	Cat 2,3-NPA	Cat 2,3-NPA	344
730138	Two Rivers	Cat 2-PA	Cat 2-PA	756
340169	Wagonga	Cat 3-PA	Cat 3-PA	1,792
860114	Waverly	Cat 3-PA	Cat 3-PA	498
340245	West Solomon	Cat 2,3-NPA	Cat 2,3-NPA	560
470061	Willie	Cat 3-PA	Cat 3-PA	199
340180	Wilmar	Cat 3-PA	Cat 3-PA	761
470016	Wolf	Cat 3-PA	Cat 3-PA	296
340141	Woodcock	Cat 2,3-NPA	Cat 2,3-NPA	170
860177	Yager	Cat 2,3-NPA	Cat 2,3-NPA	212

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