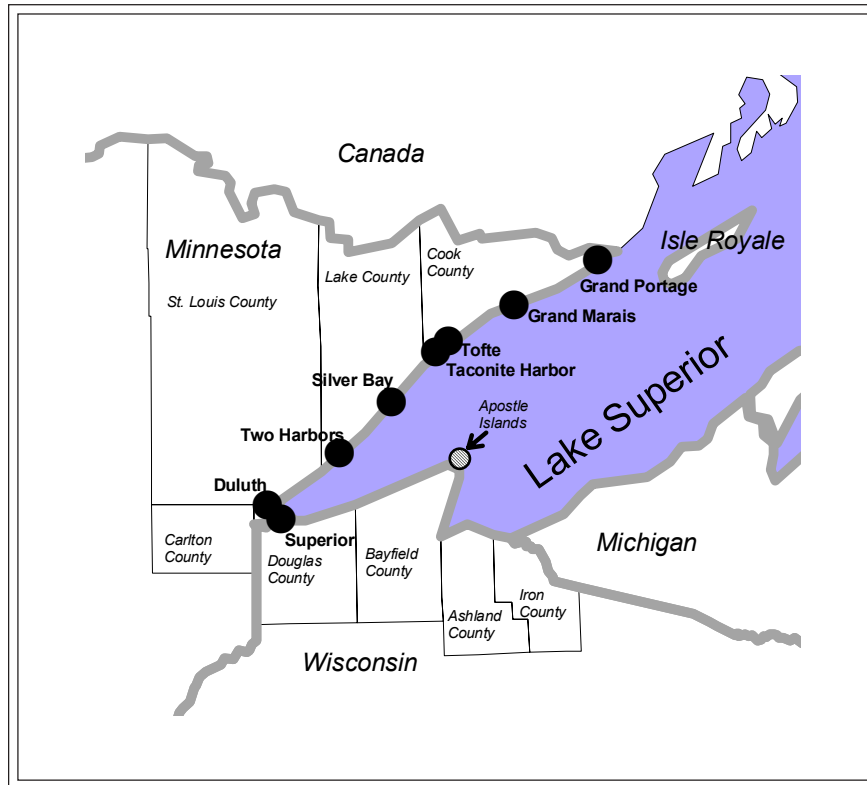


BOATING ON THE MINNESOTA PORTION OF LAKE SUPERIOR SUMMER 2002



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The 2002 Lake Superior 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

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*An electronic copy of this report can be found on the MN DNR's web site: www.dnr.state.mn.us.
Cover photos: Top—Palisade Head, USFS; Bottom—Silver Bay Safe Harbor, Marina and Access, MN DNR.*

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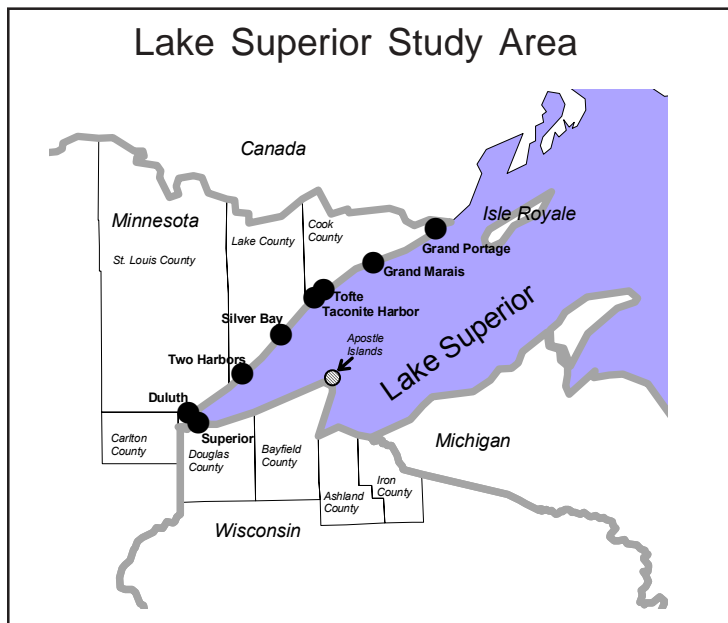
SUMMARY

INTRODUCTION

Minnesota’s Lake Superior shoreline—rugged and scenic—has for decades been a recreational destination for travelers from throughout the Upper Midwest. Numerous parks, trails, forests, resorts and related tourist facilities have been developed along the shore to serve the recreating public. Most of these facilities have been land-based, with the Lake largely appreciated from shore.

In recent years, attention has focused on more fully opening up the Lake to recreational boating, from sea kayaking to sailing to multi-day trips from port to port. Lake Superior offers Minnesota recreational boaters a truly big-water experience, not dissimilar to big-water experiences in coastal areas.

Providing for recreational boating on the Minnesota portion of Lake Superior, however, is more challenging than on Minnesota’s numerous inland lakes and streams. The rugged shore, coupled with occasional large waves, means that launch facilities and marinas need protection from the Lake. In addition, Lake Superior waters are quite cold and the weather can be unpredictable. At times, boaters need sheltered places to get off the Lake in an emergency due to weather or other boating-related problems.



To better understand Minnesota Lake Superior boating, the Minnesota DNR conducted a study during the summer of 2002. The study was designed to answer a wide variety of questions, from questions about the amount and origin of boating, to questions about boater activities, equipment, characteristics, facility preferences, and future needs. Boating-amount information was mainly obtained through field work, while boater information was garnered through surveys.

BOATING USE RESULTS

Amount of Lake Superior Boating Use

The amount of boating use in the Lake Superior study area is estimated to be nearly 141,000 boat-hours during the summer season (one “boat-hour” is one boat on the water for one hour). This estimate excludes boating that originated in the Duluth-Superior Harbor and did not travel out onto

the Lake. Most of the boating use on Lake Superior comes from public accesses (48%) and marinas (45%). A much smaller amount originates from Minnesota Point residents (3%), and the remainder comes from transient boaters from outside the study area (3%).

About half of the Lake Superior boating use (48%) originates in the Duluth area. Marina boating is more heavily concentrated than public access boating in the Duluth area, where the largest concentration of marina slips is located. More public access boating originates along the north part of the shore than either the middle shore or Duluth area in the south.

Typical of general recreation use patterns, about half of boating use occurs on weekends/holidays and about half on weekdays.

Lake Superior is cold, and boating use picks up as the summer heat sets in. During 2002, the early one-third of the season only accounted for 19 percent of boating. Each of the latter thirds (basically, July and August) accounted for about 40 percent of use. Part of the low boating in the early part of the season is attributable to the late boating start due to a cold spring.

Comparison with Other Boating Resources

The magnitude of Lake Superior boating can be put into perspective by comparing it to boating use on other resources throughout Minnesota. Lake Superior boating is larger, but roughly similar to the Whitefish chain of lakes in the Brainerd lake area of Crow Wing County, a major boating resource in that part of the state.

BOATER SURVEY RESULTS

Experience of Lake Superior Boaters

On average, boaters have been boating on Lake Superior for nearly 20 years, and almost 80 percent have been boating on the Lake for six or more years. And the long experience is across the board, from public access users, to marina users, to Minnesota Point residents.

Market Area for Lake Superior Boaters

The large majority of Lake Superior boaters in the study area are from Minnesota (91%). Wisconsin contributes 7 percent. In terms of travel distance, there is a large portion of boaters who are locals (within 25 miles of their home—47%), and a large portion who are tourists and have traveled over 100 miles (42%). There are very few at in-between travel distances.

One of the primary tourist origins is the greater Twin Cities metro area, which accounts for about one-quarter of all boating. The other primary tourist origins are long-distant travelers from counties that border Lake Superior. Overall, the counties that border Lake Superior in the study area contribute some two-thirds of all boating (this includes Douglas County, Wisconsin).

Boating Trip Characteristics

Most of the boating trips are day trips (72%), which do not extend overnight. Overnight trips comprise 28 percent of all trips, and are much more common in the north than elsewhere along the shore. The northern facilities are common origins for trips to Isle Royale.

Overnight trips are typically 3 to 5 days in length. Overnight boating trips reach some 50 to 100 miles at maximum distance from the launch site. Many of the public access trips are to Isle Royale. Marina overnights frequently travel to Isle Royale, too, as well as to the Apostle Islands.

Day use trips are typically three to six hours in length, and are substantially shorter for the Minnesota Point residents who are launching from their homes. The typical maximum travel distance from the launch site is near 10 miles for public access and marina boaters, and is shorter for Minnesota Point boaters.

The peak in the diurnal pattern of use on Lake Superior (around 11:00 AM) is shifted four to six hours earlier in the day than corresponding patterns on other Minnesota lakes. The earlier peak is probably associated with the increase in surface wind speed and accompanying wave action that occurs as the day progresses. Large waves inhibit boating on the Lake. Anglers on Lake Superior get out noticeably earlier in the day than other boaters.

Boating Activities

The primary activity of the majority of Lake Superior boaters is fishing. This is especially true of public access boaters, nearly three-fourths of whom indicate fishing as their primary activity. Fishing is not as dominant an activity of marina boaters, but it is still the largest activity. Marina boaters are more likely than public access boaters to sail and boat ride. Minnesota Point boaters have a more even mix of activities, with kayaking/canoeing the most frequent.

When they fish, anglers are predominantly targeting trout and salmon. Walleye, a distant third, is a more common sought-after species along the southern part of the shore near Duluth.

Boating Equipment

Boats used on Lake Superior are, not surprisingly, more substantial than those typically used on Minnesota lakes. The most common boat is a cruiser, which represents about half of all boats. Runabouts are more common for public access boaters, and sailboats are more common for marina boaters. Minnesota Point boaters routinely boat in kayaks and canoes.

Boat lengths are typically 20 feet for public access boaters, and nearly 30 feet for marina boaters. Marina boats have engine sizes in the 200 to 250 horsepower range, while public access boats are smaller, closer to 150 horsepower. Minnesota Point boaters use smaller boats with smaller engines.

Lake Superior boats are commonly well equipped, with onboard communications equipment, locational equipment, and safety equipment. Sanitary sewage facilities (toilet or port-a-potty) are more common on marina vessels.

Boating Safety and Enforcement

Life vests are common equipment on Lake Superior boats; just over 40 percent of boat occupants wore a life vest on their most recent trip. The percent wearing a life vest is slightly smaller than usually found for Minnesota lakes, which are typically in the high 40 to low 50 percent level.

Lake Superior boaters are far more likely to have completed a formal course in boating safety than boaters in other lake areas. Just over half of Lake Superior boaters have completed a formal course, whereas the figure is 20 to 30 percent for boaters in other lake areas.

Lake Superior boaters are more likely to believe a safety course should be required of Lake Superior boaters than of all Minnesota boaters, but the overall portion is less than 50 percent. The idea of a mandated motorboat operator's license is not very popular, with nearly two-thirds (64%) responding negatively to the suggestion.

Compared with boaters in other lake areas, Lake Superior boaters are more likely to have alcohol on board (43% for Lake Superior versus 21% to 27% for other lake areas).

The prevalence of sighting an enforcement officer is slightly higher for Lake Superior boaters (28%) than for boaters in other lake areas (16% to 21%). And the percent reported being checked by an enforcement officer is correspondingly higher, too (7% for Lake Superior versus 4% to 6% for other lake areas). Lake Superior boaters give high marks to the officers' professional conduct during the check, with 90 percent giving rating of "good" to "excellent." No negative ratings ("poor" or "very poor") were reported.

Boating Trip Satisfaction and Problems Encountered on the Water

Satisfaction with the boating trip is quite high for Lake Superior boaters. Two-thirds report being "very satisfied" and another 28 percent report being "satisfied." Lake Superior boater satisfaction is higher than in other lake areas, where the "very satisfied" ratings are in the range of 40 to 50 percent, well below the 66 percent for Lake Superior.

While on the water, the primary problems Lake Superior boaters experienced were related to weather ("high wind and waves" and "inclement weather"). This is especially true of public access and marina boaters. Minnesota Point boaters, on the other hand, have a problem mix more similar to boaters (especially lakeshore resident boaters) in other lake areas, where "use of personal watercraft (jet skis)" is the leading problem, followed by the perceived poor behavior of other boaters.

Public Access Quality

Lake Superior boaters give high marks to public access facilities in the study area. Positive ratings of "good" to "excellent" account for 85 percent of all ratings. Negative ratings are infrequent. These access ratings by Lake Superior boaters are similar to those given by boaters in other lake areas, and are nearly the same as those given in the north central lakes region.

Although positive ratings prevail, a small portion of boaters (11%) report problems in the use of access facilities; this portion is smaller than the 20 to 30 percent who report a problem in other lake areas. The leading problems have to do with the behavior of other access users, including non-boaters, and the size of the access facility. These problems were more common at Duluth-area accesses, which tend to be more congested.

When asked what improvements they desire at access sites, boaters indicate improvements that would help fix their use problems. Leading the list are access size-related improvements (“more parking spaces in lot” and “more launch lanes/ramps”). Requests for these size-related improvements are more common in the Duluth area than along the rest of the shore.

Access boaters were asked what types of information should be available at launch facilities to enhance their boating experience. Information types most frequently indicated concerned boater safety: “safe harbor locations”, “boating hazards map of lake”, “weather reports (e.g., at an automated kiosk)”, and “emergency information.” These safety-related information types were the only ones indicated by a majority of access boaters.

Marina Facilities and Services

Marina seasonal slip renters visit the marina for reasons other than to take their boat on the water. On average, just over 60 percent (61%) of visits to the marina involve a boating trip. The other visits are no doubt for boat maintenance and off-water leisure activities. In short, marina boats are commonly used like vacation cabins.

Taking overnight trips is a common activity of Lake Superior marina boaters. The majority of marina seasonal slip renters (58%) took at least one overnight trip in the last 12 months. For those who took overnight trips, the average number of nights away from the marina in the last 12 months was 12.6 and the median was 9.

Certain facilities and services at marinas are far more important to slip renters than others. Very important to slip renters are electricity dockside, private restroom and showers, running water dockside, fuel pumps, and adequate parking. Other services that are at least “moderately important” on average to slip renters are sewage pumpout, and knowledgeable marina operator(s) with whom to discuss boats and boating topics. A number of facilities and services are important to some but not others (such as “winter storage capability”) and still others are unimportant to most (such as “internet access”).

Safe Harbors and Protected Launch Ramps

The large majority of boaters express concern about being caught out on the Lake without a safe harbor nearby. Overall, 46 percent are “very concerned” and another 25 percent are “somewhat concerned.” Consistent with this concern, a majority of boaters (53%) indicate that safe harbors and protected launch ramps have permitted them to boat more often on the Lake.

Over their years on Lake Superior, a number of boaters have had various types of boating problems. Nearly one-third (31%) have had to use a safe harbor in an emergency, 16 percent have had to make a distress call, and 25 percent have needed assistance. Overall, 46 percent of boaters have experienced one of these problems.

When boaters have had to use a safe harbor, Two Harbors, Knife River, and Silver Bay lead the list in Minnesota. The Duluth-Superior Harbor and Taconite Harbor are next in frequency of use. Outside of Minnesota, harbors in the Apostle Islands and along the south shore of Lake Superior in Wisconsin are indicated most often, especially by marina boaters.

The types of distress calls and needs for emergency assistance are of one primary type: engine problems. Secondary types are for fuel problems and general boat trouble.

The large majority of boaters (71%) believe additional safe harbors (with public boat access for public access boaters) are needed on Lake Superior. Nearly 80 percent (79%) of marina boaters believe this, as do 67 percent of public access boaters. The most desired location for the additional facility is along the section of shore between Duluth and Two Harbors. This location is the most desired across the board, from public access boaters (especially) and marina boaters; and from boaters who launched in the Duluth area, to those who launched along the middle part of the shore, to those who launched along the north part of the shore.

Characteristics/Demographics of Lake Superior Boaters

Lake Superior boaters, overall, are an experienced group, having boated on the Lake for nearly 20 years; almost 80 percent have been boating on the Lake for six or more years.

The large majority of Lake Superior boaters in the study area are from Minnesota (91%). Wisconsin contributes 7 percent. In terms of travel distance, there is a large portion of boaters who are locals (within 25 miles of their home—47%), and a large portion who are tourists and have traveled over 100 miles (42%). One of the primary tourist origins is the greater Twin City metro area, which accounts for about one-quarter of all boating. The other primary tourist origins are long-distant travelers from counties that border Lake Superior. Overall, the counties that border Lake Superior in the study area contribute some two-thirds of all boating (this includes Douglas County, Wisconsin).

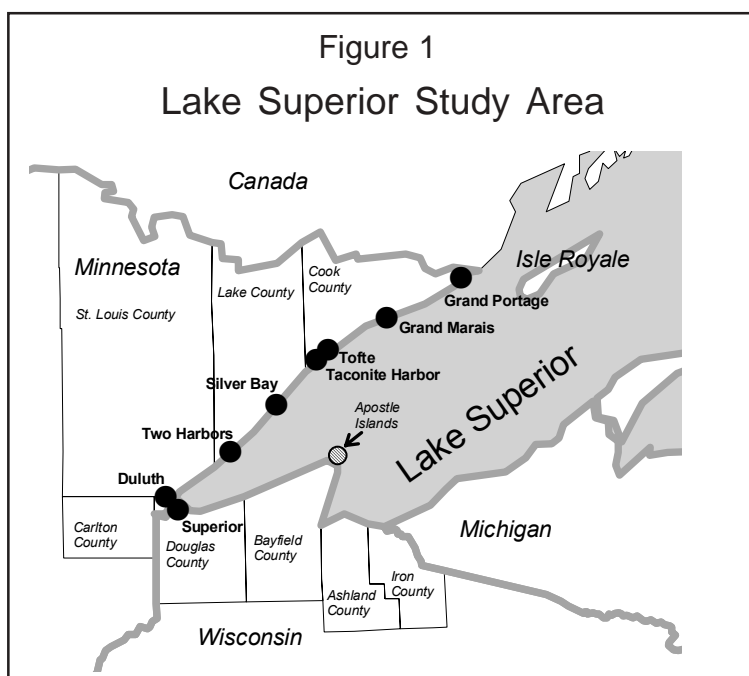
Boaters are information hungry. They indicated a high interest in having access to a Lake Superior boating guide. A majority (53%) were “very interested” in the guide, and most of the rest (34%) were “somewhat interested.” High interest was expressed across the board, from public access, to marina, to Minnesota Point boaters.

The household income of Lake Superior boaters is high compared with the general Minnesota population. The median household income in Minnesota was nearly \$50,000 in 2000 according to the U. S. Census. Just over three-fourths (77%) of Lake Superior boaters report incomes above \$50,000. Marina boaters report the highest incomes, followed by Minnesota Point residents, and public access boaters.

INTRODUCTION

Minnesota's Lake Superior shoreline—rugged and scenic—has for decades been a recreational destination for travelers from throughout the Upper Midwest. Numerous parks, trails, forests, resorts and related tourist facilities have been developed along the shore to serve the recreating public. Most of these facilities have been land-based, with the Lake largely appreciated from shore.

In recent years, attention has focused on more fully opening up the Lake to recreational boating, from sea kayaking to sailing to multi-day trips from port to port. Lake Superior offers Minnesota recreational boaters a truly big-water experience, not dissimilar to big-water experiences in coastal areas. The Minnesota portion of Lake Superior is situated at the western extreme of the Great Lakes. Boaters from other states and Canada travel into Minnesota waters, use Minnesota facilities, and continue their journeys. Similarly, Minnesota boaters travel to other states and Canada. Popular destinations for Minnesota boaters are nearby Isle Royale National Park and the Apostle Islands in northern Wisconsin.



Providing for recreational boating on the Minnesota portion of Lake Superior, however, is more challenging than on Minnesota's numerous inland lakes and streams. The rugged shore, coupled with occasional large waves, means that launch facilities and marinas need protection from the Lake. In addition, Lake Superior waters are quite cold and the weather can be unpredictable. At times, boaters need sheltered places to get off the Lake in an emergency due to weather or other boating-related problems.

To better understand Minnesota Lake Superior boating, the Minnesota DNR conducted a study during the summer of 2002 (Figure 1). No similar study, to

our knowledge, had been conducted for the Minnesota portion of Lake Superior. The study was designed to answer a wide variety of questions, from the amount and origin of boating, to the experiences boaters had on the water, to facility preferences and future needs of boaters. After a brief description of methodology, a summary of the results of the study will be presented as follows:

- Boating use results

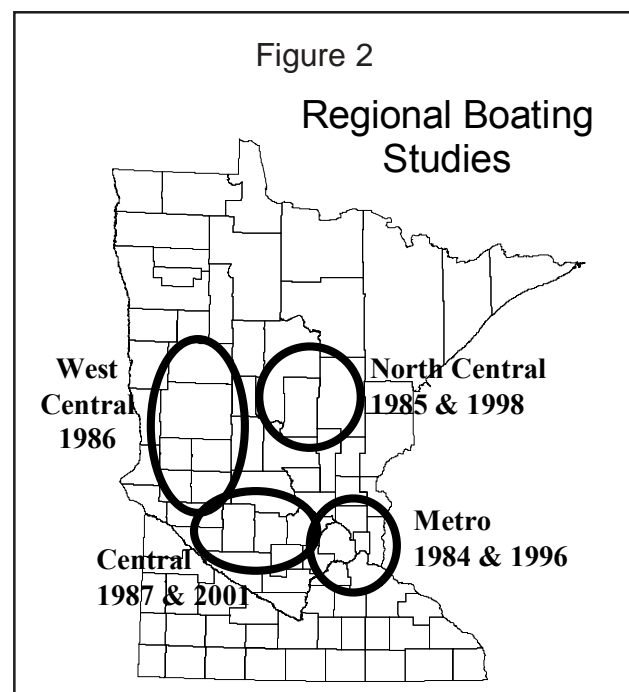
- Amount of Lake Superior boating use
- Comparison with other boating resources

- Boater survey results

- Experience of Lake Superior boaters
- Market area for Lake Superior boaters
- Boating trip characteristics
- Boating activities
- Boating equipment
- Boating safety and enforcement
- Boating trip satisfaction and problems encountered on the water
- Public access quality
- Marina facilities and services
- Safe harbors and protected launch ramps
- Characteristics/demographics of Lake Superior boaters

To provide some perspective on these Lake Superior boating results, boating information from three recent Minnesota regional studies (Twin Cities metro—1996, north central—1998, and central—2001) will be woven into the discussions (Figure 2). This will help define the unique and common characteristics of Lake Superior boating.

For those who would like greater detail on methodology and survey results, a tabulation document is available from the MN DNR. It



describes in full the methods used to conduct the 2002 study, and provides breakdowns of all survey responses by boater categories. Survey instruments are included in the tabulation document.

METHODOLOGY

The study period in 2002 covered the summer season from the Saturday of Memorial Day weekend to Labor Day. Two types of information were collected in the study: boat-use data, and survey data from boaters. Boat-use data were gathered from all the major sources of boating in the Minnesota waters of Lake Superior. There are four major sources: (1) public access launch facilities, (2) marinas, (3) Lake Superior riparian property owners, and (4) transient boaters traveling into the study area. Public access and marina data were collected by field checking facilities according to a statistical sampling schedule, and estimating boats on the water at the time of the field check (Figure 3). Marina managers routinely assisted with these boat estimations at their facilities. In addition, marina managers provided counts of transient boaters that spent the night previous to the field check at their facilities. They also distributed transient surveys to overnight boaters; the survey asked about the origin of the boating trip. Boating use for riparian property owners that originated from their property was estimated for people on Minnesota Point in Duluth, the only large concentration of residents in the study area with direct access to Lake Superior. A survey of Minnesota Point residents provided the boat-use estimates.

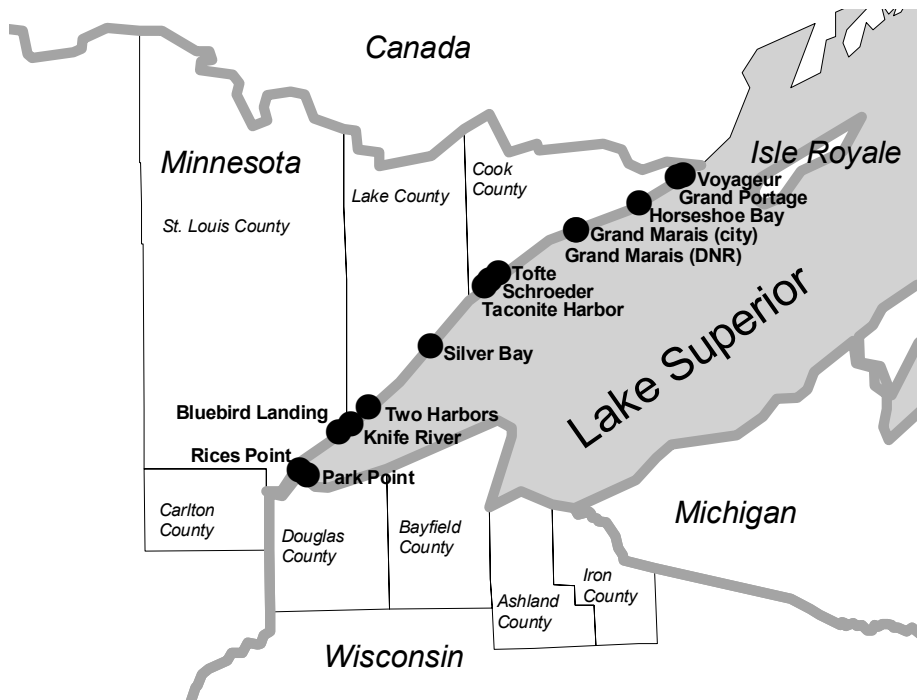
Each major source of boating use had an accompanying survey. Public access mail-back surveys were placed on windshields of all vehicles believed to have launched a boat at the time of the field check. A marina mail survey was distributed to all seasonal slip renters at cooperating marinas; nearly every marina cooperated. Marina managers, as noted above, offered mail-back surveys to transient boaters who spent the night at their facilities. Lastly, a mail survey was sent to all Minnesota Point residents in Duluth. Names and addresses of Minnesota Point residents were obtained from property tax records.

Overall, some 1050 surveys were received back: 405 from public access boaters, 391 from marina season slip renters, 213 from Minnesota Point residents, and 41 from transient boaters at marinas. The number of transient surveys is small. If

Figure 3

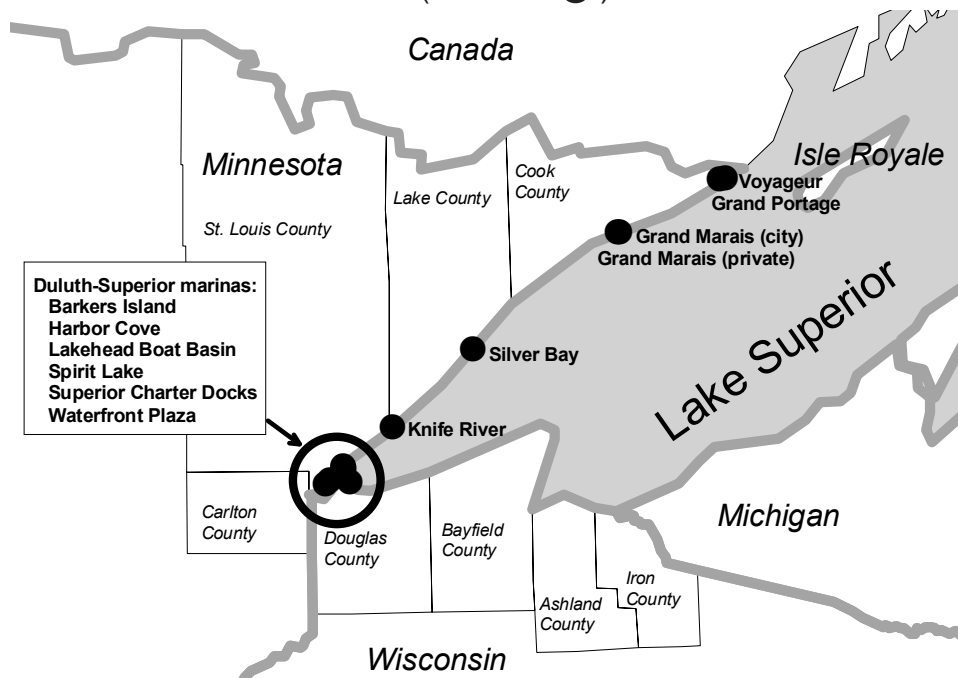
Public Accesses in Study Area

(access = ●)



Marinas in Study Area

(marina = ●)



this study is redone in the future, new procedures for contacting transient boaters should be investigated.

The survey return rates were 32 percent for the public access windshield survey, which is acceptable for this procedure; 52 percent for the one mailing of the marina survey without a follow-up mailing (the MN DNR did not have names and addresses for most marina slip renters, and the marina operators attached mailing labels to prepackaged surveys); and 53 percent for the Minnesota Point residents with one re-mail to nonrespondents. The return rate for the transient survey is not known, because records of the number offered to boaters and taken by boaters were not kept.

Since survey sampling was not proportional to boating use, survey responses are weighted by boat-use estimates. Survey-sample weighting is done by facility (each public access, each marina, and Minnesota Point residents as a single group) and day of week (weekend/holidays and weekdays). Survey-sample weighting ensures that responses from one group of boaters and/or time period are appropriately represented—in terms of boating use—when combined with responses from another group of boaters and/or time period.

BOATING USE RESULTS

Amount of Lake Superior Boating Use

The amount of boating use in the Lake Superior study area is estimated to be nearly 141,000 boat-hours during the summer season (Table 1—one “boat-hour” is one boat on the water for one hour). This estimate excludes boating that originated in the Duluth-Superior Harbor and did not travel out onto the Lake. For public accesses located in the Harbor, 35 percent of boating trips did not travel out onto the Lake, while the figure was 13 percent for marinas located in the Harbor, and 54 percent for boating trips from Minnesota Point residents. Portions of boating use that went onto Lake Superior are derived from the boater surveys.

Most of the boating use on Lake Superior comes from public accesses (48%) and marinas (45%). A much smaller amount originates from Minnesota Point residents (3%), and the remainder comes from transient boaters from outside the

Table 1

Source of summer boating use on Lake Superior in study area, 2002
(summer extends from Memorial Day weekend to Labor Day)

<u>Source of boater</u>	<u>Summer boat-hours on Lake Superior *</u>	<u>Percent</u>
<i>All sources</i>	140,758	100
● Public-access launch users	67,779	48
● Marina seasonal slip renters	63,745	45
● Marina overnight transients (excludes transient boaters who launched inside the study area)	4,568	3
● MN Point residents launching from their property (owned or easement)	4,667	3

* Excludes boating use in the Duluth-Superior Harbor.

Note: One "boat-hour" is one boat on the water for one hour.

study area (3%). The transient boating amount excludes transients that originated in the study area, for such boating use is included in the estimates for the study-area sources. The portion of transient use that originated outside the study area is estimated to be just under half of all transient use (46%), and is derived from the transient boater survey.

About half of the Lake Superior boating use (48%) originates in the Duluth area (Table 2). Marina boating is more heavily concentrated than public access boating in the Duluth area, where the largest concentration of marina slips is located. More public access boating originates along the north part of the shore (44%) than either of the other portions of the shore.

Typical of general recreation use patterns, about half of boating use occurs on weekends/holidays and about half on weekdays (Table 3). On a daily basis, the amount of boating on a typical weekend day is about double that on a typical weekday.

Table 2

Origin of summer boat-hours by source, 2002
(summer extends from Memorial Day weekend to Labor Day)

Source of summer boat-hours	All origins	----- Origin along Lake Superior shore -----		
		Duluth area	Middle (Knife River to Tofte)	North (Grand Marais to Grand Portage)
All sources	140,758	67,438	32,561	40,760
<i>Percent of boat-hours by origin</i>	<i>100</i>	<i>48</i>	<i>23</i>	<i>29</i>
Public-access launch users	67,779	19,812	17,940	30,026
<i>Percent of boat-hours by origin</i>	<i>100</i>	<i>29</i>	<i>26</i>	<i>44</i>
Marina seasonal slip renters	63,745	39,948	13,858	9,939
<i>Percent of boat-hours by origin</i>	<i>100</i>	<i>63</i>	<i>22</i>	<i>16</i>
Marina overnight transients (excludes transient boaters who launched inside the study area)	4,568	3,011	762	795
<i>Percent of boat-hours by origin</i>	<i>100</i>	<i>66</i>	<i>17</i>	<i>17</i>
MN Point residents launching from their property (owned or easement)	4,667	4,667	0	0
<i>Percent of boat-hours by origin</i>	<i>100</i>	<i>100</i>	<i>0</i>	<i>0</i>

Table 3

Summer boat-hours by day of week for public access users
and marina seasonal slip renters, 2002*
(summer extends from Memorial Day weekend to Labor Day)

	<u>Boat-hours</u>	<u>Percent</u>	<u>Days</u>	<u>Boat-hours per day</u>
<u>Total for both sources</u>				
Weekends and holidays	66,038	50	34	1,942
Weekdays	<u>65,485</u>	<u>50</u>	<u>67</u>	<u>977</u>
Total	131,523	100	101	1,302
<u>Public-access launch users</u>				
Weekends and holidays	34,983	52	34	1,029
Weekdays	<u>32,796</u>	<u>48</u>	<u>67</u>	<u>489</u>
Total	67,779	100	101	671
<u>Marina seasonal slip renters</u>				
Weekends and holidays	31,055	49	34	913
Weekdays	<u>32,689</u>	<u>51</u>	<u>67</u>	<u>488</u>
Total	63,745	100	101	631

* Public access users and marina seasonal slip renters account for 93% of all summer boat-hours in the study area.

Lake Superior is cold, and boating use picks up as the summer heat sets in. During 2002, the early one-third of the season only accounted for 19 percent of boating, and was particularly low for marinas (15%) (see Table 4). Each of the latter thirds (basically, July and August) accounted for about 40 percent of use. Part of the low boating in the early part of the season is attributable to the late boating start due to a cold spring. May 2002 was 4 degrees Fahrenheit below normal at the Duluth airport, and was the seventh coldest May in 54 years of record keeping. Due to the cold May, marina operators reported that many boaters delayed spring boat-maintenance work which, in turn, delayed the start of the boating season. June and July 2002 were above normal in temperature (2 and 4 degrees, respectively, in Duluth), while August 2002 was virtually normal.

Table 4

Summer boat-hours by period for public access users
and marina seasonal slip renters, 2002*
(summer extends from Memorial Day weekend to Labor Day)

	<u>Boat-hours</u>	<u>Percent</u>	<u>Days</u>	<u>Boat-hours per day</u>
<u>Total for both sources</u>				
Memorial Day weekend to June 30	25,494	19	37	689
July 1 to July 31	55,126	42	31	1,778
August 1 to Labor Day	<u>50,903</u>	<u>39</u>	<u>33</u>	<u>1,543</u>
Total	131,523	100	101	1,302
<u>Public-access launch users</u>				
Memorial Day weekend to June 30	16,059	24	37	434
July 1 to July 31	27,995	41	31	903
August 1 to Labor Day	<u>23,725</u>	<u>35</u>	<u>33</u>	<u>719</u>
Total	67,779	100	101	671
<u>Marina seasonal slip renters</u>				
Memorial Day weekend to June 30	9,267	15	37	250
July 1 to July 31	27,155	43	31	876
August 1 to Labor Day	<u>27,322</u>	<u>43</u>	<u>33</u>	<u>828</u>
Total	63,745	100	101	631

* Public access users and marina seasonal slip renters account for 93% of all summer boat-hours in the study area.

Comparison with Other Boating Resources

The magnitude of Lake Superior boating can be put into perspective by comparing it to boating use on other resources throughout Minnesota. All comparisons between resources are for the same days of the year and same hours of the day.

Lake Superior boating is larger, but roughly similar to the Whitefish chain of lakes in the Brainerd lake area of Crow Wing County, a major boating resource in that part of the state (Table 5). Lake Minnetonka, located in the Twin Cities metropolitan area, is probably the busiest boating resource in Minnesota. Overall, boating in the Twin Cities occurs at much higher intensities (boat-hours per lake acre) than in other parts of the state. This is evident in the comparison between Twin Cities lakes (White Bear Lake and Lake Minnetonka) and nonmetropolitan lakes (Whitefish chain and Green Lake).

Table 5

Comparison of Lake Superior summer boating use with other boating resources
(summer extends from Memorial Day weekend to Labor Day)

<u>Boating resource</u>	<u>Summer boat-hours</u>	<u>Percent of Lake Superior boat-hours</u>
● Lake Superior in study area	140,758	100
● Whitefish chain (approx 15,000 acres in Crow Wing County)	108,353	77
● Green Lake (approx. 6,000 acres in Kandiyohi County)	45,221	32
● White Bear Lake (approx. 2,500 acres in Ramsey and Washington County)	60,409	43
● Lake Minnetonka (approx. 14,000 acres in Hennepin and Carver County)	595,272	423

BOATER SURVEY RESULTS

Experience of Lake Superior Boaters

When reading the survey results, it is important to keep in mind the depth of experience of Lake Superior boaters. On average, boaters have been boating on Lake Superior for nearly 20 years, and almost 80 percent have been boating on the Lake for six or more years (Table 6). And the long experience is across the board, from public access users, to marina users, to Minnesota Point residents. This is a more extensive experience base than found in other lake areas.

	All boaters	----- <i>Source of boater</i> -----		
		Public access	Marina seasonal slip rental	MN Point residence
<u>Years boated:</u>				
Mean	18	18	18	23
Median	16	16	16	21
Percent who have boated five or fewer years	22%	20%	23%	23%

Market Area for Lake Superior Boaters

The large majority of Lake Superior boaters in the study area are from Minnesota (91%) (see Table 7). Wisconsin contributes 7 percent.

In terms of travel distance, there is a large portion of boaters who are locals (within 25 miles of their home—47%), and a large portion who are tourists and have traveled over 100 miles (42%) (see Table 8). There are very few at in-between travel distances for either public accesses or marinas. In comparison with other lake areas, Lake Superior has a higher portion of locals than the north

Table 7

Origin of Lake Superior boaters: State

<u>State</u>	All boaters (percent)	----- <i>Source of boater</i> -----		
		Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
Minnesota	91	90	93	100
Wisconsin	7	9	7	0
All others	<u>1</u>	<u>2</u>	<u>1</u>	<u>0</u>
Total percent	100	100	100	100

Table 8

Distance to launching site from permanent home for Lake Superior boaters

<u>Distance class</u>	All boaters (percent)	----- <i>Source of boater</i> -----		
		Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
Within 10 miles	35	29	36	100
11 to 25 miles	12	14	12	0
26 to 50 miles	4	4	4	0
51 to 100 miles	6	8	5	0
101 to 200 miles	25	23	29	0
201 or more miles	<u>17</u>	<u>22</u>	<u>13</u>	<u>0</u>
Total percent	100	100	100	100
<i>Median miles</i>	35	70	30	1

central region, fewer locals than the Twin Cities metro region (which is almost all near-home boating), and is most similar to the central region.

One of the primary tourist origins is the greater Twin Cities metro area, which accounts for about one-quarter of all boating (Table 9). The other primary tourist origins are long-distant travelers from counties that border Lake Superior. For

example, a Duluth resident (St. Louis County, Minnesota) who traveled up the shore to launch at Grand Portage would have traveled over 100 miles from home. The Lake Superior shoreline in Minnesota is some 150 miles long. Overall, the counties that border Lake Superior in the study area contribute some two-thirds of all boating (this includes Douglas County, Wisconsin).

Table 9
Origin of Lake Superior boaters: County

County	All boaters (percent)	----- Source of boater -----		
		Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
Local counties				
Saint Louis, MN	46	45	41	100
Lake, MN	8	9	9	0
Carlton, MN	4	3	5	0
Cook, MN	4	6	1	0
Douglas, WI	4	2	5	0
Subtotal	66	66	61	100
Greater Twin Cities counties				
Hennepin, MN	7	4	11	0
Ramsey, MN	3	3	4	0
Washington, MN	3	3	4	0
Anoka, MN	3	2	4	0
Dakota, MN	3	2	3	0
Chisago, Sherburne, Scott, Stearns, Wright, Isanti, MN	4	4	4	0
Polk, St. Croix, Pierce, WI	1	1	1	0
Subtotal	24	20	31	0
Rest of MN	7	7	7	0
Rest of WI	3	5	1	0
All other origins	1	2	1	0
Total percent	100	100	100	100

Boating Trip Characteristics

The typical Lake Superior boating party size is 3.1 people, most of whom are adults (nearly 90%) (see Table 10). Marina party sizes are larger than either public access or Minnesota Point sizes.

<u>Age class of boater</u>	<u>All boaters</u>	----- <i>Source of boater</i> -----		
		<u>Public access</u>	<u>Marina seasonal slip rental</u>	<u>MN Point residence</u>
All ages	3.1	2.7	3.7	3.1
Adults (18 or older)	2.7	2.3	3.3	2.4
Teens (12 to 17)	0.2	0.2	0.1	0.3
Children (11 or younger)	0.3	0.2	0.3	0.4

Most of the boating trips are day trips (72%), which do not extend overnight (Table 11). Overnight trips comprise 28 percent of all trips, and are much more common in the north than elsewhere along the shore. This is especially true for public access boaters who launched in the north. The northern facilities are common origins for trips to Isle Royale. On the middle and southern shore (Duluth), overnight trips are less frequent, and marina boaters are more likely to engage in overnight trips than public access boaters.

Overnight trips are typically 3 to 5 days in length (Table 12). Overnight boating trips reach some 50 to 100 miles at maximum distance from the launch site. Marina boaters tend to travel further than public access boaters. Many of the public access trips are to Isle Royale. Public access trips average about 50 miles (Table 12), and it is about 50 miles to mid or eastern Isle Royale from the northern launch sites.

Table 11

Did this boating trip extend overnight (e.g., anchored out or in a transient place)?
 Percent of Lake Superior boaters responding "Yes" to this question

Source of boater	----- Origin along Lake Superior shore -----			
	All origins (percent "Yes")	Duluth area (percent "Yes")	Middle (Knife River to Tofte) (percent "Yes")	North (Grand Marais to Grand Portage) (percent "Yes")
All sources	28	12	14	64
Public-access launch users	36	6	8	73
Marina seasonal slip renters	19	17	21	29
MN Point residents launching from their property (owned or easement)	5	5	--	--

Table 12

Trip lengths and distance traveled for overnight and day-use trips
 (responses of Lake Superior boaters)

Type of trip	All boaters	----- Source of boater -----		
		Public access	Marina seasonal slip rental	MN Point residence
Overnight trips				
<i>Number of nights</i>				
Mean nights	4.6	3.9	5.8	only four respondents took overnight trips
Median nights	3.0	3.0	3.0	
<i>Maximum distance from launch site</i>				
Mean miles	63.1	46.9	98.5	
Median miles	50.0	50.0	65.0	
Day-use trips				
<i>Number of hours</i>				
Mean hours	5.4	5.8	5.2	3.6
Median hours	5.0	5.0	5.0	3.0
<i>Maximum distance from launch site</i>				
Mean miles	10.3	9.1	11.8	6.8
Median miles	8.0	7.0	10.0	5.0

Marina overnighters frequently travel to Isle Royale, too, as well as to the Apostle Islands (Table 13). Trips to Isle Royale are more common for marina boaters who originate in the north, and trips to the Apostle Islands are more common for boaters who originate in the Duluth area to the south.

Day use trips are typically three to six hours in length, and are substantially shorter for the Minnesota Point residents who are launching from their homes (Table 12). The typical maximum travel distance from the launch site is near 10 miles for public access and marina boaters, and is shorter for Minnesota Point boaters.

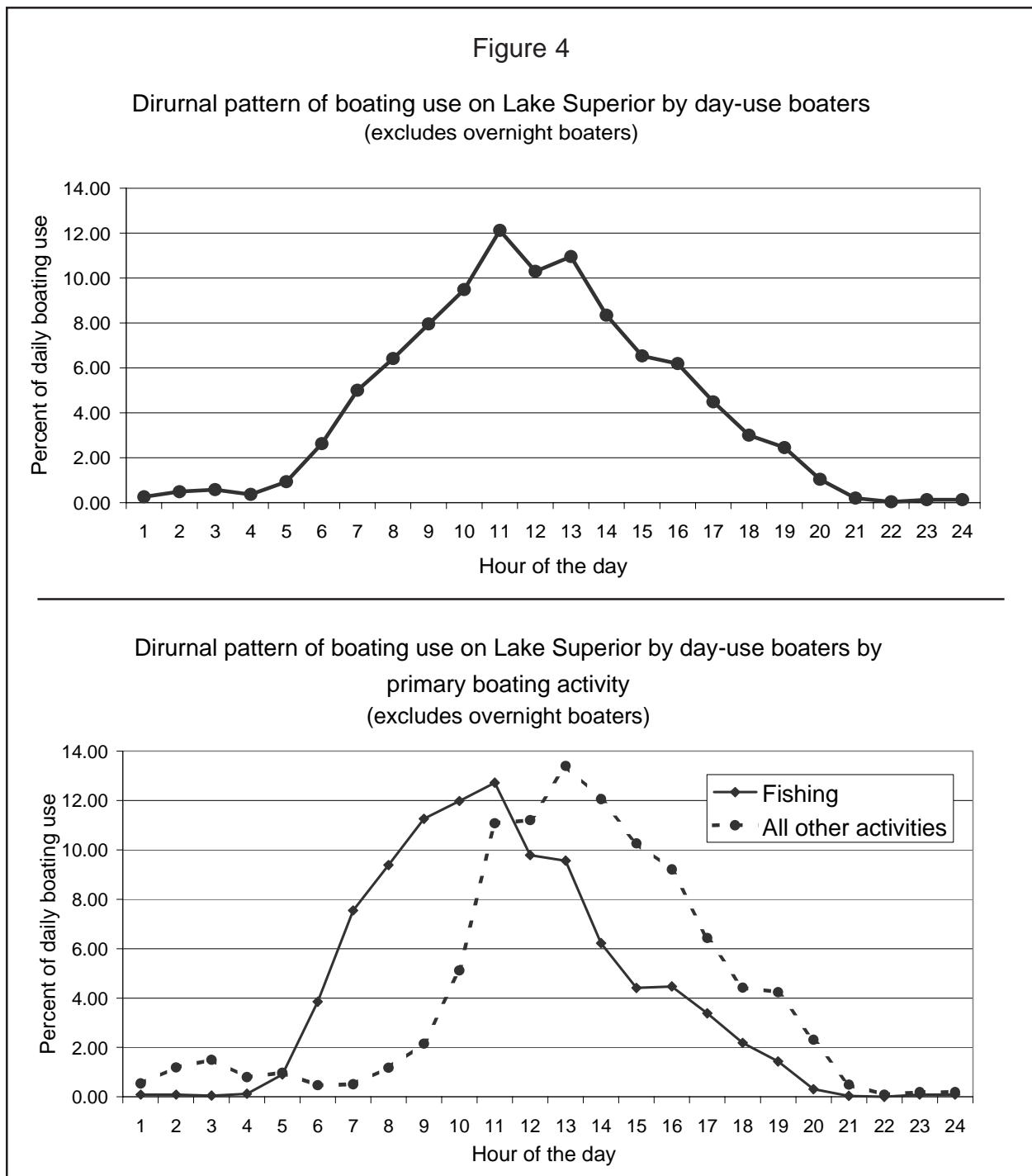
Bad weather on Lake Superior can shorten trips, especially overnight trips. When asked about their most recent trip, 19 percent of marina and Minnesota Point boaters indicated their overnight trip was shortened by bad weather; 10 percent of day-use boaters indicated a shortened trip (public access boaters were not asked this question). Weather-shortened overnight trips were typically 2 to 3 nights shorter, and day-use trips were about one hour shorter.

Table 13
Overnight trip destinations of marina seasonal slip renters
(unweighted responses)

----- *Origin along Lake Superior shore* -----

<u>Destination</u>	<u>All origins (percent)</u>	<u>Origin along Lake Superior shore</u>		
		<u>Duluth area (percent)</u>	<u>Middle (Knife River to Tofte) (percent)</u>	<u>North (Grand Marais to Grand Portage) (percent)</u>
Canada (e.g., Thunder Bay)	9	8	0	33
Isle Royale	22	16	26	56
Grand Marias to Grand Portage	8	5	16	11
Knife River to Tofte	11	14	5	0
Duluth area (including Superior, WI)	7	8	5	0
South shore of Lake Superior (Superior, WI, to Apostle Islands)	5	6	5	0
Apostle Islands	24	28	21	0
East of Apostle Islands (e.g., Michigan)	15	16	21	0
Total percent	100	100	100	100

The peak in the diurnal pattern of use on Lake Superior is shifted four to six hours earlier in the day than corresponding patterns on other Minnesota lakes (Figure 4). The earlier peak is probably associated with the increase in surface wind speed and accompanying wave action that occurs as the day progresses. Large waves inhibit boating on the Lake. Anglers on Lake Superior get out noticeably earlier in the day than other boaters.



Boating Activities

The primary activity of the majority of Lake Superior boaters is fishing (Table 14). This is especially true of public access boaters, nearly three-fourths of whom indicate fishing as their primary activity. Fishing is not as dominant an activity of marina boaters, but it is still the largest activity. Marina boaters are more likely than public access boaters to sail and boat ride. Minnesota Point boaters have a more even mix of activities, with kayaking/canoeing the most frequent.

<u>Activity</u>	All boaters (percent)	----- <i>Source of boater</i> -----		
		Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
Fishing	60	74	46	24
Boat ride	16	11	21	30
Sailing	11	1	24	6
Kayaking/canoeing	5	7	1	31
All other activities*	<u>8</u>	<u>7</u>	<u>9</u>	<u>10</u>
Total percent	100	100	100	100

* Includes sail-boarding, scuba diving, transportation, and any other activity.

Compared with activities on other Minnesota Lakes, fishing is more predominant on Lake Superior and boat riding less predominant. Fishing comprises about half of boating in the north central and central lake regions, and about one-third of boating in the Twin Cities metro region.

When they fish, anglers are predominantly targeting trout and salmon (Table 15). Walleye, a distant third, is a more common sought-after species along the southern part of the shore near Duluth.

Table 15

Types of fish anglers are targeting
(unweighted responses; anglers could indicate more than one fish type)

Fish type	All anglers (percent)	----- Source of angler -----	
		Public access (percent)	Marina seasonal slip rental (percent)
trout	84	85	81
salmon	76	74	81
walleye	9	9	10
all others	4	5	3

Boating Equipment

Boats used on Lake Superior are, not surprisingly, more substantial than those typically used on Minnesota lakes. The most common boat is a cruiser, which represents about half of all boats (Table 16). Runabouts are more common for

Table 16

Boat types on Lake Superior

Boat type	All boaters (percent)	----- Source of boater -----		
		Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
Cruiser (has cabin or superstructure)	48	34	69	17
Runabout (has windshield)	21	36	3	24
Fishing (no windshield)	11	19	1	9
Sailboat	11	1	24	5
Kayak	4	6	0	22
Canoe	1	2	0	7
All other craft*	3	2	2	17
Total percent	100	100	100	100

* Includes sail-board, pontoon, and any other craft.

public access boaters, and sailboats are more common for marina boaters. Minnesota Point boaters routinely boat in kayaks and canoes.

Boat lengths are typically 20 feet for public access boaters, and nearly 30 feet for marina boaters (Table 17). Marina boats have engine sizes in the 200 to 250 horsepower range, while public access boats are smaller, closer to 150 horsepower. Minnesota Point boaters use smaller boats with smaller engines.

Table 17

Boat size and horsepower on Lake Superior

<u>Source of boater</u>	<u>Boat length (feet)</u>		<u>Horsepower (for motorized boats)</u>	
	<u>mean</u>	<u>median</u>	<u>mean</u>	<u>median</u>
All boaters	24	23	188	170
Public access	20	19	147	140
Marina seasonal slip rental	29	28	241	225
MN Point residence	18	17	133	90

The large majority of boats have some type of communications equipment, either marine radio or cell phone (Table 18). Locational equipment (such as GPS units and depth finders) are common on Lake Superior boats, especially the marina boats. Safety equipment, too, is common; the large majority of public access and marina boaters report having each of the safety-equipment items. Sanitary sewage facilities (toilet or port-a-potty) are more common on marina vessels. For all the preceding equipment items, the frequency of occurrence on Minnesota Point boats is routinely less, as would be expected from the size and type of craft used by Minnesota Point boaters.

Table 18

Types of equipment on boats using Lake Superior

Equipment type	----- Source of boater -----			
	All boats (percent of boats)	Public access (percent of boats)	Marina seasonal slip rental (percent of boats)	MN Point residence (percent of boats)
Communications equipment				
marine radio	81	72	96	38
cell phone	74	62	91	47
cell phone or marine radio	90	85	99	58
Locational equipment				
depth finder	90	88	97	45
GPS unit	74	65	88	32
radar	29	11	53	10
Safety equipment				
life vests/pfds	100	100	100	94
lights	94	92	100	55
fire extinguisher	90	86	99	52
throwable lifesaver/buoyant cushion	90	87	98	52
horn	88	82	99	50
visual distress signal	86	80	98	43
Sanitary sewage				
toilet	46	22	77	17
port-a-potty	30	27	35	11
toilet or port-a-potty	62	40	92	25

Boating Safety and Enforcement

Life vests are common equipment on boats, as noted above, and just over 40 percent of boat occupants wore a life vest on their most recent trip (Table 19). The percent wearing a life vest is slightly smaller than usually found for Minnesota lakes, which are typically in the high 40 to low 50 percent level. The overall Lake Superior percent is lowered by the marina boaters, who may feel more secure (and thus less likely to wear a vest) on their large craft. As found in other lake studies, children are far more likely to wear life vests than adults and teens. And the majority of boaters (59%) agree that children should be legally required to wear a life vest while boating, although the majority is slim for marina boaters (52%) (see Table 20).

Table 19

Percent of boat occupants that wore a life vest on this trip?
(responses of Lake Superior boaters)

<u>Age of boater</u>	All boaters (percent)	<i>Source of boater</i>		
		Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
All ages	42	53	32	53
Adults (18 or older)	37	47	27	41
Teens (12 to 17)	62	71	44	77
Children (11 or younger)	82	91	72	100

Table 20

How much do you agree or disagree with the following statement:
Children younger than 12 years should be legally required to wear a life vest while boating.
(responses of Lake Superior boaters)

<u>Response</u>	All boaters (percent)	<i>Source of boater</i>		
		Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
Strongly agree	32	33	28	55
Agree	27	30	24	14
Neutral	21	22	20	12
Disagree	13	9	18	11
Strongly disagree	7	6	8	7
Don't know	1	0	1	2
Total percent	100	100	100	100

Lake Superior boaters are far more likely to have completed a formal course in boating safety than boaters in other lake areas (Table 21). Just over half of Lake Superior boaters have completed a formal course, whereas the figure is 20 to 30 percent for boaters in other lake areas. The portion of marina boaters having completed such a course is well above boaters from the other sources.

Table 21

Responses of Lake Superior boaters to questions concerning boating safety courses and operator licenses

Question	----- Source of boater -----			
	All boaters	Public access	Marina seasonal slip rental	MN Point residence
● <i>Have you ever taken a formal course in boating safety?</i>				
Percent responding:				
"Yes"	51	37	68	51
"No"	48	62	30	49
"Don't know/not sure"	1	0	1	0
Total percent	100	100	100	100
● <i>Should all Minnesota boat operators (powered & unpowered) be required to complete a boating safety course?</i>				
Percent responding:				
"Yes"	40	33	48	45
"No"	44	51	36	36
"Don't know/not sure"	16	15	16	19
Total percent	100	100	100	100
● <i>Should Lake Superior boat operators (powered & unpowered) be required to complete a boating safety course?</i>				
Percent responding:				
"Yes"	46	39	54	51
"No"	40	48	30	36
"Don't know/not sure"	14	13	15	14
Total percent	100	100	100	100
● <i>Should all motorboat operators be required to obtain an operator's license?</i>				
Percent responding:				
"Yes"	21	16	24	37
"No"	64	70	59	44
"Don't know/not sure"	15	14	17	19
Total percent	100	100	100	100

Lake Superior boaters are more likely to believe a safety course should be required of Lake Superior boaters than of all Minnesota boaters, but the overall portion is less than 50 percent (Table 21). Boaters having completed a safety course, however, are far more likely to believe others should too (Table 22). The idea of a mandated motorboat operator’s license is not very popular, with nearly two-thirds (64%) responding negatively to the suggestion (Table 21).

Table 22

Effect of having completed a formal boating safety course on responses of Lake Superior boaters to questions concerning safety courses and operator licenses

Question	All boaters	Have you complete a formal boating safety course?	
		"Yes"	"No"
<p>● <i>Should all Minnesota boat operators (powered & unpowered) be required to complete a boating safety course?</i></p> <p>Percent responding:</p>			
"Yes"	40	60	19
"No"	44	27	63
"Don't know/not sure"	16	13	18
Total percent	100	100	100
<p>● <i>Should Lake Superior boat operators (powered & unpowered) be required to complete a boating safety course?</i></p> <p>Percent responding:</p>			
"Yes"	46	66	25
"No"	40	23	58
"Don't know/not sure"	14	11	16
Total percent	100	100	100
<p>● <i>Should all motorboat operators be required to obtain an operator's license?</i></p> <p>Percent responding:</p>			
"Yes"	21	28	13
"No"	64	55	74
"Don't know/not sure"	15	17	13
Total percent	100	100	100

Compared with boaters in other lake areas, Lake Superior boaters are more likely to have alcohol on board (43% for Lake Superior versus 21% to 27% for other lake areas) (see Table 23). Alcohol is the most prevalent on marina boats. The prevalence of “no beverage” for Minnesota Point boaters is typical of riparian resident boaters, many of whom are taking short outings from their home.

Table 23

What kinds of beverages did you have on your boat on this trip?
(responses of Lake Superior boaters)

<u>Kinds of beverages</u>	All boaters (percent)	----- <i>Source of boater</i> -----		
		Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
Soft drinks only	54	60	47	52
Mix of soft drinks and alcoholic beverages	43	36	52	24
No beverages of any kind	<u>3</u>	<u>4</u>	<u>1</u>	<u>24</u>
Total percent	100	100	100	100

The prevalence of sighting an enforcement officer is slightly higher for Lake Superior boaters (28%) than for boaters in other lake areas (16% to 21%) (see Table 24). And the percent reported being checked by an enforcement officer is correspondingly higher, too (7% for Lake Superior versus 4% to 6% for other lake areas). Lake Superior boaters give high marks to the officers’ professional conduct during the check, with 90 percent giving rating of “good” to “excellent.” No negative ratings (“poor” or “very poor”) were reported.

Table 24

Contact with enforcement officers by Lake Superior boaters on their trip

Question	All boaters	----- Source of boater -----		
		Public access	Marina seasonal slip rental	MN Point residence
● While you were on the lake on this trip, did you see an enforcement officer?				
Percent responding "Yes"	28	32	23	19
● Were you checked by an enforcement officer?				
Percent responding "Yes"	7	8	6	0
● If checked by an enforcement officer: How would you rate the officer's professional conduct during this check?				
Percent responding:				
"Excellent"	65	62	71	(no boaters checked, so no ratings)
"Good"	25	27	22	
"Fair"	10	11	7	
"Poor"	0	0	0	
"Very poor"	0	0	0	
Total percent	100	100	100	

Boating Trip Satisfaction and Problems Encountered on the Water

Satisfaction with the boating trip is quite high for Lake Superior boaters. Two-thirds report being “very satisfied” and another 28 percent report being “satisfied.” Dissatisfaction to any extent is small (Table 25).

Lake Superior boater satisfaction is higher than in other lake areas, where the “very satisfied” ratings are in the range of 40 to 50 percent, well below the 66 percent for Lake Superior. The higher Lake Superior satisfaction occurs in spite of the fact that Lake Superior has a higher prevalence of fishing than other lake areas, and anglers tend to give lower satisfaction ratings than boaters engaged in other activities. Anglers on Lake Superior follow the pattern and report lower boating satisfaction than other boaters. However, both angling and non-angling boaters report higher satisfaction on Lake Superior as compared with angling and non-angling boaters in other lake areas.

Table 25

Overall, how satisfied or dissatisfied were you with your boating experience on this trip?
(responses of Lake Superior boaters)

Boater response	----- Source of boater -----			
	All boaters (% of boaters)	Public access (% of boaters)	Marina seasonal slip rental (% of boaters)	MN Point residence (% of boaters)
very satisfied	66	66	65	87
satisfied	28	29	29	13
dissatisfied	4	4	4	0
very dissatisfied	1	0	2	0
don't know	0	1	0	0
Total percent	100	100	100	100

The reasons Lake Superior boaters gave for high satisfaction are good weather and good fishing, followed by the usual motivations for outdoor leisure activities (relax/get away, be with family/friends, experience nature/natural beauty). Weather and fishing were the major negatives, too, along with crowded boat ramps for public access boaters.

While on the water, the primary problems Lake Superior boaters experienced were related to weather (“high wind and waves” and “inclement weather”) (see Table 26). This is especially true of public access and marina boaters. Other problems for public access and marina boaters were far less common. Minnesota Point boaters, on the other hand, have a problem mix more similar to boaters (especially lakeshore resident boaters) in other lake areas, where “use of personal watercraft (jet skis)” is the leading problem, followed by the perceived poor behavior of other boaters (“excessive speed in channels and crowded areas”, “careless or inconsiderate operation of boats” and “boats operating too fast, too close to shore/docks”).

Table 26

Problems encountered on the water by Lake Superior boaters
(percent of boaters indicating a "moderate", "serious", or "very serious" problem)

Potential problem	All boaters (% of boaters)	----- Source of boater -----		
		Public access (% of boaters)	Marina seasonal slip rental (% of boaters)	MN Point residence (% of boaters)
high wind and waves	30	25	38	16
inclement weather	24	18	33	12
use of personal watercraft (jet skis)	11	8	13	34
high wakes	10	7	13	19
excessive speed in channels and crowded areas	10	6	13	22
careless or inconsiderate operation of boats	9	6	12	20
commercial fish nets	9	5	15	4
boats not yielding the right-of-way	7	5	8	8
navigating the harbor entrance	6	4	8	3
the amount of noise from boats on the lake	5	3	7	19
boats operating too fast, too close to shore/docks	5	3	6	21
boat operators who have been drinking too much	4	1	6	9
near miss or collision	3	2	3	8
scuba divers	0	0	0	0

Public Access Quality

Lake Superior boaters give high marks to public access facilities in the study area. Positive ratings of “good” to “excellent” account for 85 percent of all ratings. Negative ratings are infrequent (Table 27).

These access ratings by Lake Superior boaters are similar to those given by boaters in other lake areas, and are nearly the same as those given in the north central lakes region.

Although positive ratings prevail, a small portion of boaters (11%) report problems in the use of access facilities (Table 28); this portion is smaller than the 20 to 30 percent who report a problem in other lake areas. And experiencing these problems does have a noticeable (albeit minor) effect on access ratings (Table 27). The effects of experiencing problems on access ratings were more marked in

Table 27

How would you rate this access for launching and landing a boat?

(responses of Lake Superior boaters who launched at a public access)

<u>Response</u>	All access users (percent)	<i>Problem using this access on this trip?</i>	
		"Yes" (percent)	"No" (percent)
excellent	44	40	45
good	41	31	43
fair	10	18	9
poor	1	4	1
very poor	1	6	0
don't know	3	0	2
Total percent	100	100	100

Table 28

What was the problem with the use of the access?

(responses of the 11% of Lake Superior public-access boaters who had a problem)

<u>Problem description</u>	Percent of those who had a <u>problem</u>
other boaters not prepared prior to launching	37
access parking lot being used by non-boaters	31
insufficient number of launch lanes/ramps	30
not enough parking spaces	23
docks blocked by boats, anglers	21
ramp blocked by parked cars, campers etc.	20
difficult to launch/land because of wind or waves	13
not enough maneuvering room on water near ramp for launch/landing	12
access site in disrepair	9
ramp slope not steep enough	8
water too shallow	6
safety of entry to access area from road or highway	5
inadequate directional signs to access	4
not enough maneuvering room on land near ramp for launch/landing	2

other lake areas. The leading problems have to do with the behavior of other access users, including non-boaters, and the size of the access facility (Table 28).

Problems related to other boaters and the size of the access facility were more common at Duluth-area accesses, which tend to be more congested. In the Duluth area, 48 percent of boaters report that they have found the access parking lot full at some time in the past, similar to what was found in the north central and central lake regions. Finding the access lot full is far less frequent (18 percent of boaters) for access along the remainder of the Lake Superior shore.

When asked what improvements they desire at access sites, boaters indicate improvements that would help fix their use problems (Table 29). Leading the list are access size-related improvements (“more parking spaces in lot” and “more launch lanes/ramps”). Requests for these size-related improvements are more common in the Duluth area than along the rest of the shore. The only other

Table 29

Which of the following improvements do you feel are need at this launch site?

(responses of Lake Superior boaters who launched at a public access)

<u>Improvement description</u>	<u>Percent of boaters indicating the improvement is needed</u>
more parking spaces in lot	29
trash containers	26
more launch lanes/ramps	21
lake location maps	16
latitude, longitude for site	14
beacon light visible from lake	11
toilet maintenance (if applicable)	11
better directional signs to access	9
toilets	9
litter pickup	9
toilet pumpout	9
better lighting of access/parking area	8
dredging	8
better informational signs at access	7
protection from wind/waves in front of launch ramp	7
better enforcement	3

prominent improvement was a traditional one found across lake areas, namely, “trash containers.”

Access boaters were asked what types of information should be available at launch facilities to enhance their boating experience. The most frequently indicated information types concerned boater safety, and only these safety-related information types were indicated by a majority of access users: “safe harbor locations”, “boating hazards map of lake”, “weather reports (e.g., at an automated kiosk)”, and “emergency information” (Table 30). Next in information requests were “commercial fish net locations”, followed by “fishing information for lake”, “marina locations”, and a “Lake Superior location map.”

Table 30

What types of information should be available at Lake Superior public boat accesses to enhance your boating experience?
(responses of Lake Superior boaters who launched at a public access)

<u>Type of information</u>	<u>Percent indicating type of information</u>
safe harbor locations	67
boating hazards map of lake	58
weather reports (e.g., at an automated kiosk)	55
emergency information	51
commercial fish net locations	42
fishing information for lake	39
marina locations	37
Lake Superior location map	33
latitude, longitude of access site	29
information on where to buy boat gas	29
description of natural history of lake	19
toilet pumpout locations	12
kayak campsites	9

A small portion of public access boaters (3%) reported that they had a disability that affects when or where they boat. Nearly all of these boaters found the access facility adequate for their needs. One boater reported the access inadequate, but it was uncertain if this inadequacy (“no operating toilet”) was related to the boater’s disability. Designated handicapped parking was used by just over one-fourth (26%) of boaters reporting a disability.

Marina Facilities and Services

Similar to the preceding questions about public accesses posed to the users of those facilities, seasonal slip renters were asked a series of specific questions about their marina use and the services they desire at marinas.

Marina seasonal slip renters visit the marina for reasons other than to take their boat on the water. On average, just over 60 percent (61%) of visits to the marina involve a boating trip (Table 31). The other visits are no doubt for boat maintenance and off-water leisure activities. In short, marina boats are commonly used like vacation cabins.

Marina boaters engage in a wide variety of land-based activities (Table 32). Eating out at restaurants is the most frequent activity, followed by general sightseeing, shopping, visiting historic sites, and visiting state parks. Many also participate in hiking, biking and golfing.

Taking overnight trips is a common activity of Lake Superior marina

Table 31

Boat-use by marina seasonal slip renters over the last 12 months

	<u>median</u>	<u>mean</u>
● Days visited boat at marina	40	56
● Days took boat out of slip and on the water	25	34

Table 32

What are the land-based leisure activities you engage in as part of a vacation outing to your boat at the marina?

(responses of marina seasonal slip renters)

<u>Activity</u>	<u>Percent indicating activity</u>
eating out at restaurants	90
general sightseeing	65
shopping	61
visiting historic sites	50
visiting state parks	41
hiking	39
biking	26
golfing	20
visiting nightclubs	19
camping	15
attending plays or concerts	13
casino visits	11
tennis	8

boaters. The majority of marina seasonal slip renters (58%) took at least one overnight trip in the last 12 months. For those who took overnight trips, the average number of nights away from the marina in the last 12 months was 12.6 and the median was 9.

Certain facilities and services at marinas are far more important to slip renters than others. Very important to slip renters are electricity dockside, private restroom and showers, running water dockside, fuel service, and adequate parking (Table 33). Other services that are at least “moderately important” on average to slip renters are sewage pumpout, and knowledgeable marina operator(s) with whom to discuss boats and boating topics. A number of facilities and services are important to some but not others (such as “winter storage capability”) and still others are unimportant to most (such as “internet access”).

Table 33

How important is it to have the following facilities and services available to you at a marina where you rent a slip?
(responses of marina seasonal slip renters)

Facility/service	mean importance rating (range 1 to 4)	not important (=1) (percent)	slightly important (=2) (percent)	moderately important (=3) (percent)	very important (=4) (percent)	Total (percent)
● electricity connection dockside	3.6	3	8	12	77	100
● private restrooms and showers for marina patrons	3.6	4	7	14	75	100
● running water connection dockside	3.5	5	7	18	70	100
● gasoline/diesel fuel pumps	3.5	7	10	8	75	100
● adequate parking for me and my guests	3.5	4	5	29	62	100
● sewage pumpout services	3.3	15	7	13	65	100
● knowledgeable marina operator(s) with whom to discuss boats and boating topics	3.0	16	14	22	48	100
● boat repair services	2.7	19	18	32	31	100
● haul-out service	2.7	27	13	19	41	100
● winter storage capability	2.7	30	14	18	39	100
● restaurant opportunities near the marina	2.6	19	22	40	19	100
● places to shop for groceries and other items near the marina	2.5	24	20	37	19	100
● ship store	2.4	27	25	33	15	100
● laundry facilities	2.1	41	26	17	16	100
● entertainment opportunities near the marina	1.9	45	25	21	9	100
● shuttle or transportation service for shopping, restaurants and entertainment outings	1.8	55	19	18	7	100
● cable TV connections	1.4	73	12	11	3	100
● internet access	1.4	74	13	10	3	100

Safe Harbors and Protected Launch Ramps

As noted in the introduction to this report, providing for recreational boating on the Minnesota portion of Lake Superior is more challenging than on Minnesota's numerous inland lakes and streams. The rugged shore, coupled with occasional large waves, means that launch facilities and marinas need protection from the Lake. In addition, Lake Superior waters are quite cold and the weather can be unpredictable. At times, boaters need sheltered places to get off the Lake in an emergency due to weather or other boating-related problems. This section of the report examines boater opinions on the topics of protected launch ramps and safe harbors.

The large majority of boaters express concern about being caught out on the Lake without a safe harbor nearby. Overall, 46 percent are "very concerned" and another 25 percent are "somewhat concerned" (Table 34). Public access and marina boaters are similar in their concerns. Minnesota Point boaters, however, are much less concerned, probably because many are taking short trips near home.

Table 34

How concerned are you about being caught out on Lake Superior without a safe harbor nearby (a "safe harbor" is a protected location where boaters can safely retrieve a boat or be sheltered from a storm)?

(responses of Lake Superior boaters)

<u>Boater response</u>	<i>Source of boater</i>			
	<u>All boaters</u> (percent)	<u>Public access</u> (percent)	<u>Marina seasonal</u> <u>slip rental</u> (percent)	<u>MN Point</u> <u>residence</u> (percent)
very concerned	46	43	51	19
somewhat concerned	25	26	25	17
slightly concerned	14	14	13	19
not concerned	15	15	11	46
don't know	<u>1</u>	<u>1</u>	<u>0</u>	<u>0</u>
Total percent	100	100	100	100

Safe harbors and protected launch ramps have permitted the majority of boaters to boat more often on the Lake (Table 35). Once again, Minnesota Point residents, who launch from home and take relatively short boating trips, are different in this regard. Nearly one in five boaters (17%) are unaware of these facilities. Boaters who are unaware of these facilities have fewer years of boating experience on Lake Superior (median of 9 years) compared with other boaters (median of 18 years). Less experience may be a contributing factor to lower awareness.

Table 35

Have the safe harbors that have been built on Lake Superior permitted you to boat more often on the Lake? *
(responses of Lake Superior boaters)

<u>Boater response</u>	----- <i>Source of boater</i> -----			
	All boaters (percent)	Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
Yes	53	57	52	19
No	29	23	34	57
I'm not aware of the safe harbors	<u>17</u>	<u>20</u>	<u>13</u>	<u>23</u>
Total percent	100	100	100	100

* Wording was slightly different for public access boaters: "Have the safe harbors/**protected launch ramps** that . . ."

Over their years on Lake Superior, a number of boaters have had various types of boating problems. Nearly one-third (31%) have had to use a safe harbor in an emergency, 16 percent have had to make a distress call, and 25 percent have needed assistance (Table 36). Overall, 46 percent of boaters have experienced one of these problems. Marina boaters have experienced more of each type of problem than public access or Minnesota Point boaters.

Table 36

Occurrences of boater emergencies, distress calls, and needs for assistance on Lake Superior
(responses of Lake Superior boaters)

Question	All boaters (percent)	----- Source of boater -----		
		Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
● Have you ever had to use a Lake Superior safe harbor in an emergency? "Yes" response	31	27	37	29
● When boating on Lake Superior, have you ever had to make a distress call to other boaters, the DNR or another public agency? "Yes" response	16	13	19	17
● When boating on Lake Superior, have you ever needed assistance from other boaters, the DNR or another public agency? "Yes" response	25	20	32	22
● Any instances of "yes" in the preceding three? "Yes" response in any of the preceding three	46	40	54	43

When boaters have had to use a safe harbor, Two Harbors, Knife River, and Silver Bay lead the list in Minnesota (Table 37). The Duluth-Superior Harbor and Taconite Harbor are next in frequency of use. Outside of Minnesota, harbors in the Apostle Islands and along the south shore of Lake Superior in Wisconsin are indicated most often, especially by marina boaters. Marina boaters are probably more likely than public access boaters to travel along the south shore to the Apostle Islands.

Table 37

Which safe harbor used in emergency?
(unweighted responses)

<u>Safe harbor indicated</u>	----- Source of boater -----		
	All boaters (percent)	Public access (percent)	Marina seasonal slip rental (percent)
<i>Minnesota</i>			
Two Harbors	16	28	9
Knife River	15	17	13
Silver Bay	14	11	16
Duluth/Superior	8	13	6
Taconite Harbor	8	5	10
Grand Marais	4	2	4
Grand Portage	3	3	2
Splitrock lighthouse (nearby)	1	2	1
Beaver Bay	1	1	1
Tofte	0	1	0
Horseshoe Bay	0	1	0
Palisade Creek	0	1	0
Blue Bird landing	0	1	0
<i>Out of State</i>			
Apostle Islands & South shore in WI	19	8	26
Isle Royale	4	5	4
All others	5	0	2
Total percent	100	100	100

The types of distress calls and needs for emergency assistance are of one primary type: engine problems. Secondary types are for fuel problems and general boat trouble (Table 38).

Table 38

What was the reason for the distress call?
(unweighted responses)

<u>Reason indicated</u>	----- Source of boater -----		
	All boaters (percent)	Public access (percent)	Marina seasonal slip rental (percent)
Engine problem/motor quit	59	65	56
Out of gas/fuel problem	7	9	6
Help other people	6	2	9
Boat trouble	5	2	7
Ship on rocks	5	2	6
Rough weather	5	2	6
Injury/medical	4	0	6
Dead battery	3	5	1
Leaking/sinking boat	3	5	1
Fog	2	2	1
Man overboard/death	1	2	0
Other boat on fire	1	2	0
Total percent	100	100	100

What was the reason for needing assistance?
(unweighted responses)

<u>Reason indicated</u>	----- Source of boater -----		
	All boaters (percent)	Public access (percent)	Marina seasonal slip rental (percent)
Engine problem/motor quit	61	67	58
Boat trouble	13	2	19
Out of gas/fuel problem	8	13	5
Dead battery	5	10	2
Grounded boat	5	0	7
Leaking/sinking boat	3	5	3
Rough weather	2	0	3
Fog	1	2	1
Injury/medical	1	0	2
Lost dingy	1	2	0
Total percent	100	100	100

The large majority of boaters (71%) believe additional safe harbors (with public boat access for public access boaters) are needed on Lake Superior (Table 39). Nearly 80 percent (79%) of marina boaters believe this, as do 67 percent of public access boaters. Consistent with previous responses, Minnesota Point boaters are much less likely to indicate a needed for additional facilities of this type.

Table 39

Do you think additional safe harbors are needed on Lake Superior?
(responses of Lake Superior boaters)

<u>Boater response</u>	<u>All boaters (percent)</u>	<i>Source of boater</i>		
		<u>Public access (percent)</u>	<u>Marina seasonal slip rental (percent)</u>	<u>MN Point residence (percent)</u>
Yes	71	67	79	36
No	18	21	12	44
Don't know	11	12	10	19
Total percent	100	100	100	100

* Wording was slightly different for public access boaters: "Do you think an additional public boat access with safe harbor is needed on Lake Superior?"

The most desired location for the additional facility is along the section of shore between Duluth and Two Harbors (Table 40). This location is the most desired across the board, from public access boaters (especially) and marina boaters; and from boaters who launched in the Duluth area, to those who launched along the middle part of the shore, to those who launched along the north part of the shore. For boaters who launched in the north, the part of the shore from Silver Bay to Grand Marais is indicated nearly as frequently as the part from Duluth to Two Harbors as a location for an additional facility.

Table 40

If you think an additional safe harbor is needed on Lake Superior, where is it needed?*

(unweighted responses from public access and marina boaters)

Location of additional safe harbor	Source of boater -----				Origin along Lake Superior shore -----		
	All origins (percent)	Public access (percent)	Marina seasonal slip rental (percent)	Duluth area (percent)	Middle (Knife River to Toftle) (percent)	North (Grand Marais to Grand Portage) (percent)	
Duluth to Knife River/Two Harbors	52	67	37	53	58	39	
Knife River/Two Harbors to Silver Bay	11	8	13	9	16	7	
Silver Bay to Grand Marais	19	17	21	14	18	34	
Grand Marais to Grand Portage	7	3	11	5	6	15	
Duluth South Shore	11	4	18	19	2	4	
All others	0	0	0	0	0	1	
Total percent	100	100	100	100	100	100	

* Wording was slightly different for public access boaters: "Do you think an additional public boat access with safe harbor is needed on Lake Superior?"

The leading reason, by far, that public-access boaters offer for the need for the additional facility is safety: “new location would make me feel safer when I’m on the water” (Table 41) This question concerning the reason for the additional facility was only asked of public-access boaters. Had the question been posed to marina boaters, a similar response would likely have been received, given how dominant the safety-related reason was for public-access boaters.

Table 41

Why is an additional public access with safe harbor needed?

(responses of Lake Superior public-access boaters who thought an additional public access/safe harbor was needed)

<u>Reason</u>	<u>Percent of boaters indicating reason</u>
new location would make me feel safer when I’m on the water	76
new location is where the fish are	25
present access is too congested	21
present access is too difficult to launch/retrieve a boat in certain weather	12

Characteristics/Demographics of Lake Superior Boaters

Certain characteristics of Lake Superior boaters have already been described. These boaters, overall, are an experienced group, having boated on the Lake for nearly 20 years; almost 80 percent have been boating on the Lake for six or more years (see previous section on “Experience of Lake Superior boaters”).

The large majority of Lake Superior boaters in the study area are from Minnesota (91%) (see previous section on “Market area for Lake Superior boaters”). Wisconsin contributes 7 percent. In terms of travel distance, there is a large portion of boaters who are locals (within 25 miles of their home—47%), and a large portion who are tourists and have traveled over 100 miles (42%). One of the primary tourist origins is the greater Twin City metro area, which accounts for

about one-quarter of all boating. The other primary tourist origins are long-distant travelers from counties that border Lake Superior. For example, a Duluth resident (St. Louis County, Minnesota) who traveled up the shore to launch at Grand Portage would have traveled over 100 miles from home. The Lake Superior shoreline in Minnesota is some 150 miles long. Overall, the counties that border Lake Superior in the study area contribute some two-thirds of all boating (this includes Douglas County, Wisconsin).

The MN DNR is interested in opportunities to reach boaters with information, and, thus, asked questions in the surveys about on-line access and radio station listening habits. Regarding on-line access, Lake Superior boaters are a “wired” group. The large majority (82%) are connected to an on-line service and the Internet (Table 42). A majority—albeit a slim majority (51%)—have visited the MN DNR web page. Regarding radio, boaters listen to a wide variety of radio stations. Overall, no single type of radio station is clearly dominant, except for Minnesota Point residents, who indicated public radio as predominant (Table 43).

<u>Question</u>	<u>All boaters</u>	----- <i>Source of boater</i> -----		
		<u>Public access</u>	<u>Marina seasonal slip rental</u>	<u>MN Point residence</u>
<ul style="list-style-type: none"> ● <i>Do you have a home computer connected to an on-line service or the Internet?</i> "Yes" percent 	82	79	85	89
<ul style="list-style-type: none"> ● <i>Have you ever visited the Minnesota DNR web page (www.dnr.state.mn.us)?</i> "Yes" percent 	51	57	47	34

Table 43
What type of radio station do you primarily listen to?
 (responses of Lake Superior boaters)

<u>Type of station</u>	----- <i>Source of boater</i> -----			
	All boaters (percent)	Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
Easy listening/lite	21	19	24	17
Country	18	23	14	4
Rock & roll	18	18	20	9
Public radio	16	15	14	44
Talk	10	13	7	9
Classical	8	5	13	7
Sports	4	4	4	2
Jazz	1	0	1	0
Other	3	4	3	8
Total percent	100	100	100	100

Boaters are information hungry. They indicated a high interest in having access to a Lake Superior boating guide (Table 44). A majority (53%) were “very interested” in the guide, and most of the rest (34%) were “somewhat interested.”

Table 44
How interested would you be in having a “Guide to Lake Superior Boating” prepared for boaters like yourself?
 (responses of Lake Superior boaters)

<u>Boater response</u>	----- <i>Source of boater</i> -----			
	All boaters (percent)	Public access (percent)	Marina seasonal slip rental (percent)	MN Point residence (percent)
very interested	53	51	57	50
somewhat interested	34	33	36	32
not interested	10	14	6	17
don't know/not sure	2	3	2	2
Total percent	100	100	100	100

High interest was expressed across the board, from public access, to marina, to Minnesota Point boaters.

The household income of Lake Superior boaters is high compared with the general Minnesota population (Table 45). The median household income in Minnesota was nearly \$50,000 in 2000 according to the U. S. Census. Just over three-fourths (77%) of Lake Superior boaters report incomes above \$50,000. Marina boaters report the highest incomes, followed by Minnesota Point residents, and public access boaters.

Table 45

Which category best describes your total household income before taxes last year?
(responses of Lake Superior boaters)

<u>Income category</u>	<u>All boaters</u> <u>(percent)</u>	<i>Source of boater</i>		
		<u>Public access</u> <u>(percent)</u>	<u>Marina seasonal</u> <u>slip rental</u> <u>(percent)</u>	<u>MN Point</u> <u>residence</u> <u>(percent)</u>
less than \$30,000	5	8	3	2
\$30,000-\$39,999	9	11	5	11
\$40,000-\$49,999	9	10	8	6
\$50,000-\$74,999	27	31	22	34
\$75,000-\$99,999	23	23	24	11
\$100,000 or more	<u>27</u>	<u>17</u>	<u>38</u>	<u>37</u>
Total percent	100	100	100	100

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