

White Bear Lake, Minnesota (Google Earth)

2024 Summer Lake Use Study for White Bear Lake

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**White Bear Lake
Conservation District**



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2024 Summer Lake Use Study for White Bear Lake

SUMMARY

This lake use study consisted of a shoreline boat inventory, boat launching frequency, the type of boats launched, and lake boat density. In addition, a homeowners survey and exit boater survey were conducted.

The methods of this study were designed to allow comparisons to the 1999, 2002, 2005, and 2008 lake use surveys and the shoreline inventories of riparian boats and structures.

In 2024, boat inspections were conducted at the Ramsey County and Matoska Park Public accesses by the MnDNR, Ramsey County, or Washington County inspectors. A total of 3,206 inspections were conducted over 114 days from April 27 to October 4. These inspections were used to determine boat launching frequency and type of boats launched from the 2 public boat accesses.

This study used six days of monitoring, observations and analyses - four peak-use days and two off-peak use days with a timeframe of 6:00 am to 9:00 pm to evaluate boat density on the whole lake and moored boat launchings from the Commercial Bay marinas.

FINDINGS & CONCLUSIONS

This study produced these findings and conclusions:

Shoreline Watercraft and Lake Structure Inventory

2024: A total of 1,479 watercraft were counted along the lake shoreline. Pontoons and kayaks were the dominant watercraft. A total of 476 docks and 653 boat lifts were observed. A total of 636 watercraft were counted at commercial marinas.

Previous Shoreline Inventories from 1999, 2002, 2004, 2005, and 2008: There have been an increasing number of boats stored along the lakeshore including more PWCs, pontoons, paddleboards, and kayaks. There has been a decrease in the number of fishing boats (boats with rear tillers), canoes, and sailboats.

- Biggest increase in watercraft numbers over the past 25 years were kayaks and paddleboards.
- The number of watercraft moored in the Commercial Bay have increased 20% since 1999.
- Along the lake shoreline there has been a slight increase since 1999 in the number of boat lifts (12%) but a decrease in rafts. These structures do not appear to pose a hazard to navigation.
- Docks, although not specifically measured for size, appear to be increasing in size and complexity from 1999 to 2024.
- The number of powered boats and sailboats per dock (2 craft per dock) have stayed relatively constant from 2002 to 2024.

Boat Launchings and Access Parking

2024: Boat launching from the 2 public accesses was based on MnDNR inspection records. A full access parking lot was typical from 1:30-4:00 pm on peak use days with good weather. Lake users were able to find side street parking for boat trailers in residential areas when the access lot was full. With higher lake levels since 2014, launching at the Ramsey County access has been easier. Signage installed at the landing to instruct boaters on loading and unloading techniques is adequate.

Previous Lake Use Studies (1999 and 2005): When accounting for weather and other factors, the busiest boat launching times during peak use days were 1:30-4:00 pm.

- Comparing boat launch statistics from MnDNR inspection data in 2024 to previous access counts in 1999, 2002, and 2005 is not entirely comparable. Launch data before 2024 were from the 2 accesses that were staffed for the whole 15 hour time period. In 2024 inspectors recording launches were not always present at both launches. The total number of launches on peak days is down in 2024 and fits with a decrease in lake boat density since 1999 as well.
- There is an increasing number of boat launchings during off-peaks days, and the use is spread more evenly throughout the day. In 1999 launch use was more concentrated during the evening.
- The types of boats in use do not appear to be changing during peak use days, but there are more runabouts and fewer fishing boats on off-peak days. One reason for this observation relates to our definition of ‘runabout’, which includes a steering console. We observed many runabouts engaged in fishing activities.
- Longest wait observed during the 6 days with continuous monitoring at 2 access sites in 2005 was at 40 minutes in the 1:30 to 3:00 pm time period on July 4 at Ramsey Beach, with shorter waiting times at the Matoska Landing. Current public access appears adequate for current lake usage on most days except on weekends with nice weather from 1:30 to 4:00 pm.

Types of Boats Launched

2024: The dominant types of watercraft launched from the 2 public accesses were runabouts (34%) and fishing boats (rear tiller or steering console)(33%). Dominant boat launches on off-peak days were fishing boats at 49% followed by runabouts (inboard-outboard motor). From Commercial Bay marinas, the dominant watercraft launches were pontoons.

Previous Boat Launching Studies (1999, 2002, and 2005): The percent of pontoon launchings have increased since 1999 and waterski/wakesport have increased slightly. Sailboat launchings have decreased. The percent of personal watercraft (PWC) launchings have remained fairly constant although PWCs have increased in the shoreline inventory. The dominant watercraft launched from the 2 public accesses over the years have been runabouts while the increase in pontoon launching in 2024 cuts into the fishing boat/runabout category percentages.

Boat Densities on White Bear Lake

2024: The lake-wide highest average boat density on WBL for 3 peak days in 2024 was 18 acres/boat (Table 1). This occurred in the mid-afternoon on peak days. The north bay had the highest number of boats (Table 1). Boat density on 2 off-peak days was 30 acres/boat and the north bay was the busiest (Table 1). White Bear Lake is considered safe most of the time except for several hours on peak days based on MnDNR criteria of 20 lake acres per boat. The north bay has the highest density of boats which also includes the anchored boats rafting in shallow water.

Previous Boat Density Studies (1999 and 2005): Boat density on peak days may be decreasing from 1999, whereas, boat density on off-peak days has remained somewhat constant. The lake can be crowded on weekends but it is considered safe. Boat numbers and densities are self-limiting.

Table 1. Average of the highest boat density of each bay and for the whole lake. White Bear Lake boat counts were taken over 10 time periods in a 15-hour day for peak and off-peak days. Boat counts were taken in three sectors for each time period. The numbers reflect the average for the maximum boat counts for a time interval during the day for peak and off peak days.

	1999		2005		2024		1999		2005		2024	
	PEAK (3 days)		PEAK (3 days)		PEAK (3 days)		OFF-PEAK (3 days)		OFF-PEAK (2 days)		OFF-PEAK (2 days)	
	# of boats	ac/boat	# of boats	ac/boat	# of boats	ac/boat	# of boats	ac/boat	# of boats	ac/boat	# of boats	ac/boat
North Bay (739 ac)	75	10	46	16	67	11	26	28	35	21	26	28
South Bay (1,036 ac)	60	17	57	18	37	28	30	35	22	47	33	31
West Bay (645 ac)	41	16	40	16	32	20	20	32	23	28	21	31
Whole lake (2,420 ac)	176	14	143	17	136	18	76	32	80	30	80	30

2024 Lake Homeowner Surveys (85 responses)

- 15% of the respondents have lived on WBL for 40 years or more.
- Dominant watercraft usage are pontoons, kayaks, and paddleboards.
- Lake residents use the lake an average of 3 times per week.
- Main lake use by lake residents is pleasure boating.
- 81% of the respondents find the lake was crowded on weekends.

2024 Boater Exit Surveys (42 responses)

- Average time on the lake was 3 hours.
- Average number of times visiting WBL in a season was 17 visits.
- In early morning responses, the primary activity was fishing. Recreational boating dominated in the afternoon.

CONCLUSIONS AND RECOMMENDATIONS

- Existing ordinances for offshore no-wake buffers of 200 feet from shore are adequate pending more information of impacts of surf wake boats. The density of surf wake boats on WBL was relatively low in 2024, with not more than 2 wake-surf boats in a bay at any time period during the 6 days of lake observations which includes four 15-hour peak days.
- Commercial Bay marina may be nearing build-out, meaning additional dock spaces may not be available. The bay itself could be impacted with high boat density on busy weekend days however navigation is at slow speeds. In contrast boating density on the open water of the whole lake is generally safe based on MnDNR criteria 20 lake surface acres per boat. However, on peak days, there are several afternoon hours, especially in the North Bay, where boat densities are less than 20 ac/boat.
- As more research becomes available on lake impacts from boating activities, the WBLCD should incorporate latest research findings as it applies to White Bear Lake into revised regulations. Boat density considerations and impacts of wakesurfing on lake shorelines, water quality, and boater safety are areas to be tracking.
- It is suggested when boat access inspectors are present at the landings, they could remove aquatic plants by raking out plants at the access. In 2024, 22% of boats leaving the access had aquatic plants on the trailer. Zebra mussels could be attached to the plants and transported to the other lakes if plants are not removed from the trailers.
- MnDNR boat inspection records should be reviewed annually to determine the frequency of visits to WBL from lakes with AIS, such as starry stonewort and spiny waterflea, that are not currently in WBL. Future Lake Use and Trend Analysis reports should occur every 5 years and utilize MnDNR inspection data where feasible.
- The White Bear Lake shoreline has very few vacant lots that could result in new development. Most residential construction is redevelopment. Since the number of homes is not increasing, it is not surprising the number of docks and the number of powered boats have not significantly increased since the last inventory in 2008. Also the number of trailer parking spots in the two primary public accesses have remained the same since the last lake use survey in 2002. It appears boat-powered lake density has not changed significantly in the last 20 years, although boat horsepower has increased. The most dramatic changes in lake use on White Bear Lake have been an increase in pontoons, kayaks, and paddleboards, and a decrease in sailboats and rear-tiller fishing boats. Wakeboats are more common compared to the last survey in 2005 and raise safety concerns based on questionnaire survey responses. Similar concerns of power boat impacts were registered in the previous questionnaire survey from 2005 as well.

1. INTRODUCTION

History of Lake Use Studies: The White Bear Lake Conservation District (WBLCD) adopted a lake management plan in May 1999 that called for lake use studies. That plan called for a lake use study to establish an objective baseline. The WBLCD commissioned Dick Osgood, *Osgood Consulting* and Steve McComas of *Blue Water Science* to conduct the first summer (1999) and winter (2000) lake use survey of White Bear Lake. Since 2000, there have been 5 additional lake use studies (listed below) including the effort in 2024.

1999-2000: Lake Use Study: 3 peak days, 3 off-peak days (6:00 am - 9:00 pm)(included 3 winter lake use days) and a shoreline boat inventory.

2002: “Mini” Lake Use Survey: 4 peak days, 2 off-peak days (9:00 am - 6:00 pm) and a shoreline boat inventory.

2004: Shoreline boat inventory

2005: Lake Use Survey: 4 peak days, 2 off-peak days (6:00 am - 9:00 pm) and a shoreline boat inventory.

2008: Shoreline boat inventory.

2024: Lake Use Survey: 4 peak days (although 3 peak days were used for statistics due to rain on one of the peak days), 2 off-peak days (6:00 am - 9:00 pm) for boat density on the lake. We used MnDNR records of 3,000 inspections over 114 partial inspection days for boat landing access frequency. A shoreline boat inventory was also conducted.



Figure 1. A-Class sailboat (scow design) at a dock on White Bear Lake on August 20, 2024.

2. METHODS USED IN THIS STUDY

2.1. Shoreline Watercraft and Structure Inventory

A detailed inventory of shoreline watercraft was conducted during an off-peak period when shoreland owner boat use was minimal (as detected by very few watercraft on the water). This inventory was conducted on Wednesday, July 17 and Tuesday, August 20, 2024.

Watercraft were categorized according to the same criteria listed in Table 2. The type of docks, rafts, Raves, and mooring facilities were noted as well. Categories included:

Docks

Lifts

Mooring Buoys

Rafts (made from pontoons)

Rafts (inflatable, including Raves and other similar brands)

Table 2. Watercraft categories used in 2008 and 2024.

	1999, 2002, 2004, 2005, and 2008 Boat Categories	2024 Boat Categories	
		Blue Water Science Shoreline Boat Inventory and Boat Density Observations	MnDNR Inspection Program for Boat Launching from 2 Public Accesses
Fishing	A small open-hull boat with an outboard motor operated using a rear tiller.	Same as 2008.	V-hulled boat with a steering console or rear tiller. Usually have an outboard motor.
Canoe	Hand paddled or small motor. This category also includes kayaks.	Classic canoe (paddle is single blade).	
Kayak	Included with the canoe category. Kayaks were less than 5% of the canoe numbers in 2008.	Kayak use increased significantly since 2008 and had its own category in 2024. Defining characteristic is the paddle has 2 blades.	
Personal Watercraft (PWC)	Single or double seated. Jet propulsion system.	Same as 2008.	
Runabout	Open or close-hulled boat with an inboard or outboard motor and a steering console.	Same as 2008. Includes wakesport boats.	Used for watersports, cruising, and fishing. Typically an inboard-outboard motor.
Sail	A boat rigged for sailing.	Same as 2008.	
Pontoon	A boat with a platform mounted on pontoons.	Same as 2008.	
Waterski	A boat pulling water skiers or specifically rigged for pulling waterskiers.	Tow boat actively pulling skiers on the lake. Only used for boat density data.	Not a category used by the MnDNR for boats entering the lake.
Other	Boats not listed above (for example a dingy).	Same as 2008.	
Wakesport	No category in 2008	Included with runabout category.	Watercraft with ballast tanks and an inboard motor.

2.2. Launches from Public Access

In 2024, boat launches from the Ramsey County access and the Matoska Park access were recorded by inspectors, when present, from the MnDNR, Ramsey County, or Washington County on 114 days over a timeframe from April 27 to October 4, 2024. A total of 3,206 inspection reports were evaluated from the MnDNR website. Inspections were recorded from 6:00 am to 7:30 pm, with the most common time period from 8:00 am to 3:00 pm. Boat categories used for boats that were launched are shown in Table 2.

2.3. Boat Density Observations on the Lake

For determining boat densities on White Bear Lake, this study focused on six days using four peak-use days and two off-peak use days. Peak-use days were selected to represent peak use times during the summer. These included weekend or holiday days. Off-peak days were mid-week weekdays. The monitoring dates in 2024 were:

	Temperature Range	Precipitation
Peak		
May 27, Monday (Memorial Weekend) (Because of rain for several hours, data are listed but not included in statistics for peak days).	52-67°F	0.49 inch
July 7, Sunday (July 4 th Weekend)	64-82°F	Trace
August 10, Saturday (Weekend)	53-74°F	0 inch
August 24, Saturday (Weekend)	65-85°F	0 inch
Off-Peak		
July 17, Wednesday	62-75°F	0 inch
August 20, Tuesday	63-76°F	0 inch

Each sampling day was divided into ten, hour-and-a-half intervals beginning at 6:00 a.m. through 9:00 p.m. Boat density on the open lake was determined by an observer using a boat to travel around White Bear Lake to record the number and type of boats for each 1.5 hour interval for four peak and two off peak days.

Observations of boats leaving and entering Commercial Bay from boat slips were made by an observer in a position to count all watercraft entering or leaving the Commercial Bay, as well as some activities within the Commercial Bay.

3. RESULTS OF 2024 DATA COLLECTION

3.1. Shoreline Watercraft Inventory

A detailed shoreline boat inventory was completed on July 17 and August 20, 2024. For riparian areas, the types of docking facility (docks and lifts) was noted along with the numbers and types of watercraft. The results are summarized in Tables 3 and 4.



Figure 2. From a previous lake use study, shoreline conditions along Segment D in 2005.

Table 3. White Bear Lake Residential Shoreline Survey: Boats and Docks (July 17 and August 20, 2024)(using WBL boat categories from previous inventories).

	Lake Segment A (1.03 miles)	Lake Segment B (0.91 miles)	Lake Segment C (2.56 miles)	Lake Segment D (3.29 miles)	Lake Segment E (3.36 miles)	Lake Segment F (1.86 miles)	TOTAL (13.01 miles)
Structures							
Docks	40	19	65	158	163	31	476
Lifts	42	12	105	252	195	47	653
Buoys	3	6	5	--	4	5	23
Rafts-on pontoons	--	--	1	2	--	1	4
Rafts-inflatable	--	--	2	3	3	--	8
Swimming Rafts	--	--	4	--	--	--	4
Rave Rafts	--	--	--	2	3	--	5
Total	85	37	177	417	368	84	1,168
Structures/mile	83	41	71	127	110	45	90
Boat Counts							
Fishing (rear-tiller)	1	--	5	21	11	2	40
PWC	11	2	15	58	39	2	127
Runabout	15	10	44	121	106	22	318
Sailboat	4	5	14	24	33	2	82
Pontoon	39	15	60	94	148	12	368
Dingy	1	--	--	--	1	--	2
Canoe*	6	2	11	13	10	1	43
Kayak*	25	12	42	138	121	11	349
Paddleboat*	1	1	--	7	8	--	17
Paddleboard*	4	11	13	62	39	4	133
Total	107	58	204	538	516	56	1479
Motor powered and sail boats/dock	1.8	1.7	2.1	2.0	2.1	1.3	2.0
All boats/dock	2.7	3.1	3.1	3.4	3.2	1.8	3.1
<i>(Human-powered)*</i>	<i>(36)</i>	<i>(26)</i>	<i>(66)</i>	<i>(220)</i>	<i>(178)</i>	<i>(16)</i>	<i>(542)</i>

*Human powered = canoe, kayak, paddleboat, and paddleboard.

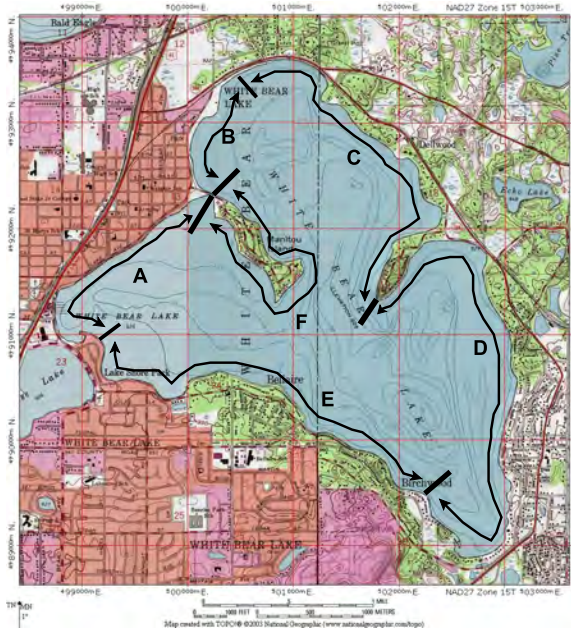


Figure 3. Map of shoreline segments used for boat counts on August 20 and July 17, 2024.

Table 4. White Bear Lake Lakewide Marina Boat Inventory (July 17, 2024)(using WBL boat categories from previous inventories. In Commercial Bay (Figure 4) four marinas are represented and include the following: City of WBL (160 slips), Docks of WBL (250 slips), Tallies Dockside (64 slips), and VFW (26 slips). In Commercial Bay there are permits for 500 slips.

	WB Yacht Club	Commercial Bay (Total for Four Marinas)	Matoska Park	TOTAL
Fishing (rear-tiller)	--	10	6 (on shore)	16
Canoe/Kayak	--	8 (kayaks)	17 canoes (on shore) 14 kayaks (on shore)	17 canoes 22 kayaks
PWC	--	1	--	1
Runabout	10	133	--	143
Sailboat	52	36	3 (on shore) 20 (in lake)	111
Pontoon	6	304	--	310
Paddleboat	--	--	1 (on shore)	1
Sailboard	--	4	--	4
Dingy	--	--	11	11
Total	68	496	72	636

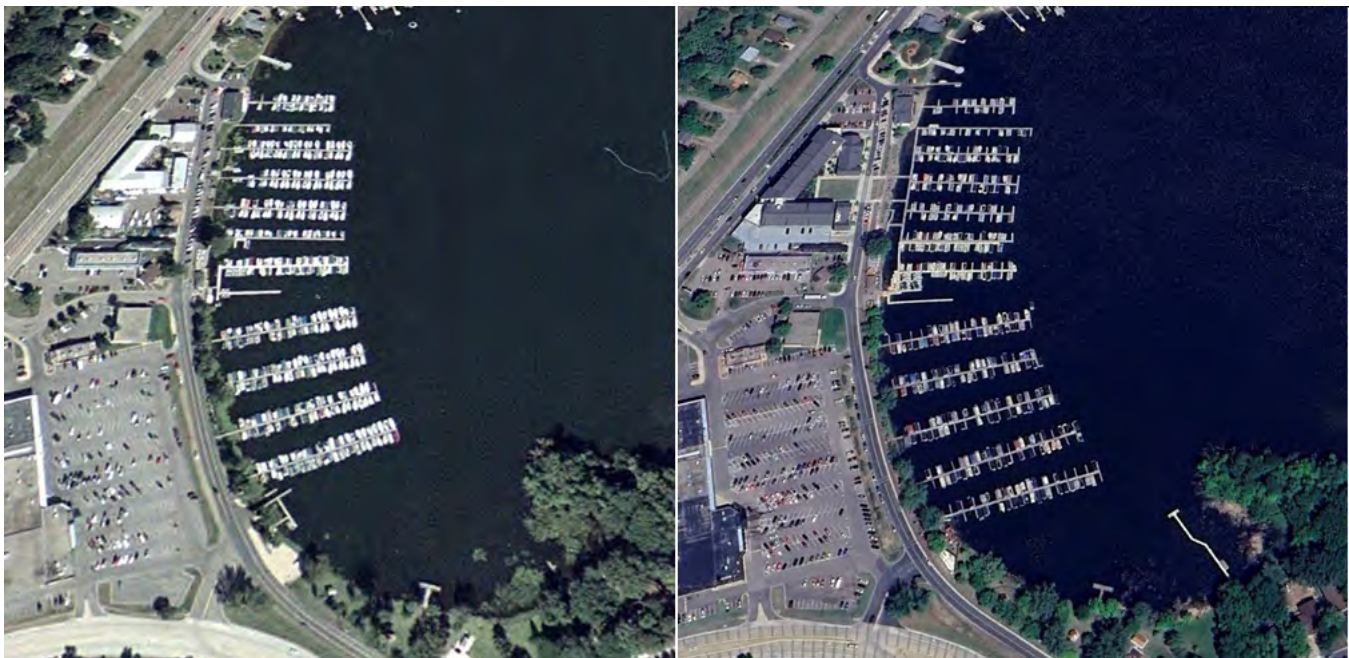


Figure 4. Aerial view of Commercial Bay area in 2004 (left) and 2023 (right)(from Google Earth).

3.2. Boat Launching Frequency, Types of Boats, and Boat Density

Where Boats Gain Access to White Bear Lake: Watercraft gain access to White Bear Lake through public and private accesses as well as riparian (lakeshore) properties. In addition to Matoska Park and Ramsey County access, boats enter the lake from boat slips in the Commercial Bay marinas. Launches from White Bear Lake residences were not evaluated.

Table 5 indicates the number of boats launched on off-peak and peak use days from Commercial Bay. August 24, 2024 had the highest launch rate of the three peak days. Memorial Day (5.27.24) was rainy and data were not used in the average.

Table 6 shows the total access activity of the two public access areas and for Commercial Bay marinas for off-peak and peak use days. Public access activity (boat launches/hr) is about 77% higher for peak use days at the public access and about 71% higher for Commercial Bay.

Table 5. Number of boats launched per hour at Commercial Bay on White Bear Lake on 4 peak days and 2 off-peak days.

	Commercial Bay Peak Day Launches					Commercial Bay Off Peak Day		
	5/27/24*	7/7/24	8/10/24	8/24/24	Average*	7/17/24	8/20/24	Average
Boats per hour	1.9	9.7	7.5	13.5	10.2	6.4	3.3	4.8
Total boats launched	29	146	113	202	154	96	49	73

*5/27/24 data not included in average due to rain starting at 4:30 pm.

Table 6. Summary of MnDNR boat inspection data for the number of boat launches and the total number of inspection hours. The number of days (typically partial days) inspectors were present was also noted. These data are based on boats launched per hour. In Table 7, boat launchings are grouped into 1.5 hour intervals. Commercial Bay data was based on 5 days of observations by Blue Water Science (3 peak days and 2 off peak days).

	Ramsey Co. Access	Matoska Park Access	Total	Commercial Bay
Peak Days				
Inspection Days	28	22	50	3
Inspection Hours	146	96	242	45
Boats Launched	681	436	1,117	461
Boats/hr	4.7	4.5	9.2	10.2
Off-Peak Days				
Inspection Days	36	28	64	2
Inspection Hours	250	160	410	30
Boats Launched	718	345	1,063	145
Boats/hr	2.9	2.2	5.1	4.8
Peak and Off-Peak Days Combined				
Inspection Days	64	50	114	5
Inspection Hours	396	256	652	75
Boats Launched	1,399	780	2,179	606
Boats/hr	3.5	3.0	6.5	8.1

When Boats Are Launched: Boat launchings (based on MnDNR inspection records) reach a maximum during late afternoon on off-peak days compared to maximum numbers occurring in early afternoon on peak use days (Table 7). Total boat launchings from the public access on peak use days were nearly double compared to off-peak days (Table 7). On peak use days, significant boat launchings originate from the Commercial Bay. During off-peak days, boat launchings from Commercial Bay peaked in early evening (Table 7).

Table 7. Average number of launches for each time interval from Summer 2024. Gray shading indicates most popular time interval. Boat launches from County and City accesses were based on MnDNR inspection records.

	PEAK DAY AVERAGE							OFF PEAK DAY AVERAGE						
	Average Launch per Interval			Days of Inspection				Average Launch per Interval			Days of Inspection			
	Ramsey County Access (28 days)	Matoska Park (22 days)	Two Accesses Total	Ramsey County Access (28 days)	Matoska Park (22 days)	# Inspection Days (n=50 days)	Commercial Bay (n=3 days)	Ramsey County Access (36 days)	Matoska Park (28 days)	Two Accesses	Ramsey County Access (36 days)	Matoska Park (28 days)	# Inspection Days (n=64 days)	Commercial Bay (n=2 days)
6:00-7:30	3.6	1.5	5.1	3	2	5	2.0	2.3	1.4	3.7	4	5	9	1
7:30-9:00	4.9	2.8	7.7	17	9	24	8.7	3.5	2.2	5.7	18	14	29	4.5
9:00-10:30	7.7	4.7	12.4	22	14	27	9.3	4.1	2.9	7.0	29	19	40	1.5
10:30-12:00	5.6	6.3	11.9	20	15	29	17.0	4.9	3.6	8.5	29	21	42	2.5
12:00-1:30	12.2	10.2	22.4	11	16	24	22.0	4.2	3.6	7.8	31	19	43	6.5
1:30-3:00	7.1	5.3	12.4	14	12	25	32.3	4.6	3.1	7.7	27	18	40	7.5
3:00-4:30	5.3	4.4	9.7	12	5	16	26.3	5.0	3.6	8.6	23	11	32	10.5
4:30-6:00	7.0	--	7.0	1	0	1	25.6	3.0	11.0	14.0	2	1	13	16
6:00-7:30	1.0	--	6.0	1	0	1	11.0	3.5	--	3.5	2	0	2	22
7:30-9:00	--	--	--	0	0	0	2.7	1.5	--	1.5	2	0	2	2.5



Figure 5. Different activities are enjoyed on White Bear Lake including surf boarding on August 20, 2024.

Types of Boats Launched: On peak days the most popular boat model launched into White Bear Lake is the runabout (usually an inboard/outboard motor), followed by fishing boats (typically a v-hull with an outboard motor) and pontoons (Table 8). Jet skies account for 7% of the launchings at the two public accesses.

On off-peak days, fishing boats are still the dominant type of boat launched with runabouts coming in a distant second. Sail boat use was similar for the public access and increased on off-peak days from the Commercial Bay sites. Jet skies maintain the same percentage of launchings as recorded for peak days.

Table 8. Types of boats that went out to White Bear Lake in the summer 2024 (MnDNR watercraft classifications are used for public accesses).

	City and County Public Access (MnDNR Inspection Records and MnDNR boat categories)				Commercial Bay (Blue Water Science Observations)			
	Peak Day n=50 days		Off Peak Day n=64 days		Peak Day n=4 days		Off Peak Day n=2 days	
	total	%	total	%	total	%	total	%
Fishing Boat	367	33%	522	49%	1	0.2%	0	0
Canoe/Kayak	11	1%	9	1%	1	0.2%	0	0
PWC	76	7%	75	7%	0	0	0	0
Runabout	382	34%	243	23%	145	29%	38	26%
Sail Boat	13	1%	13	1%	17	3%	10	7%
Pontoon	152	14%	127	12%	299	61%	94	65%
Wakesport	112	10%	66	6%	28	6%	0	0
Other	4	0.4%	8	1%	1	0.2%	3	2%
TOTAL	1,117	100%	1,063	100%	492	100%	145	100%



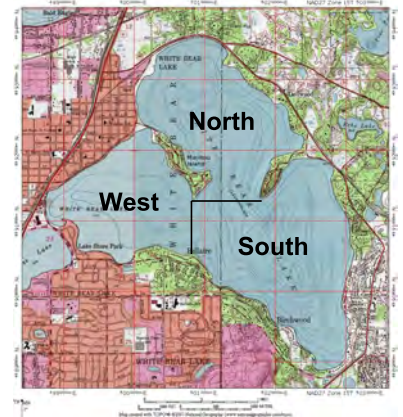
Figure 6. Example of a runabout boat style from 2005. In 2024, this was still called a runabout.

Number of Boats (boat density) on White Bear Lake: The number of boats or boat density, on White Bear Lake was highest on July 7, 2024 and August 24, 2024. It's possible warm temps influence lake use (Table 9). Typically, the most crowded time of the day was from 1:30 to 4:30 during the peak days and from 4:00 to 7:30 pm during the off peak days (Table 9). Some rafting of boats, where boats are anchored in shallow water, was also common on peak days especially in the North Bay.

Table 9. Number of boats in use on White Bear Lake in the summer 2024 (from 6:00 am to 9:00pm). Numbers in parentheses represent active towed boats which include tubers, waterskiers, or wake boarders (towed boats are included in the total number of boats). Wake surfing was observed on only several occasions. * = busiest time period. Weather conditions and temp range are under the date. Gray shading indicates boat densities at 20 acres per boat or less.

	PEAK DAYS															
	May 27, 2024 (calm, some rain, 52-67°F)				July 7, 2024 (calm, sunny, 64-82°F)				August 10, 2024 (choppy, 53-74°F)				August 24, 2024 (choppy, 65-85°F)			
	North Bay (739 ac)	West Bay (645 ac)	South Bay (1,036 ac)	Whole Lake (2,420 ac)	North Bay (739 ac)	West Bay (645 ac)	South Bay (1,036 ac)	Whole Lake (2,420 ac)	North Bay (739 ac)	West Bay (645 ac)	South Bay (1,036 ac)	Whole Lake (2,420 ac)	North Bay (739 ac)	West Bay (645 ac)	South Bay (1,036 ac)	Whole Lake (2,420 ac)
	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats
6-7:30	2	3	4	9	6	3	5	14	5	2 (1)	3	10	7	5	6	18
7:30-9	3	7	7 (1)	17	13	26	16 (1)	55	10	7 (1)	7	24	9 (1)	10 (1)	11 (1)	30
9-10:30	4	9 (2)	2	15	15	13	17	45	14	8	11	33	16	24	12	52
10:30-12	1	4	5	10	19 (2)	18	23 (3)	60	20	13	11	44	25	19	23	67
12-1:30	3	3	0	6	47 (3)	19	36 (3)	102	31 (2)	12 (1)	21 (2)	64	37 (2)	35	17 (1)	89
1:30-3	5	4	3	12	54 (3)	24	35 (4)	113	40 (1)	11	38* (2)	89	75 (1)	35* (3)	33* (2)	143*
3-4:30	10*	13* (1)	9* (1)	32*	64 (2)	31 (1)	41* (1)	136	41* (2)	21* (1)	32 (2)	94*	64 (2)	28 (1)	26 (1)	118
4:30-6	8	6	3	17	83* (3)	38 (1)	39 (2)	160*	30 (2)	15 (1)	21	66	77* (2)	22 (2)	33 (2)	132
6-7:30	7	7 (1)	0	14	56 (1)	39* (2)	28 (2)	123	34 (1)	13	24 (1)	71	70	22 (1)	24 (2)	116
7:30-9	7 (1)	8 (2)	5	20	27 (2)	19 (1)	25 (3)	71	19	13 (1)	15 (1)	47	23 (2)	15	20	58
Total	50	64	38	152	384	230	265	879	244	115	183	542	403	215	205	823
Peak time intervals density: acres per boat	74	81	115	76	9	17	25	15	18	31	27	26	10	18	31	17

	OFF-PEAK DAYS							
	July 17, 2024 (choppy, sunny, 62-73°F)				August 20, 2024 (calm, 63-76°F)			
	North Bay (739 ac)	West Bay (645 ac)	South Bay (1,036 ac)	Whole Lake (2,420 ac)	North Bay (739 ac)	West Bay (645 ac)	South Bay (1,036 ac)	Whole Lake (2,420 ac)
	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats	# of boats
6-7:30	3	3 (1)	2	8	1	3	1	5
7:30-9	8 (1)	7 (1)	5	20	3	4	7 (1)	14
9-10:30	19	7	9	35	2	4	7 (1)	13
10:30-12	25	11	11	47	10	5	2	17
12-1:30	23 (1)	11	11	45	5	9	2	16
1:30-3	23	6	14 (1)	43	11	7	7 (1)	25
3-4:30	20	11	10	41	20* (1)	8	11 (1)	39
4:30-6	32*	12	16	60	18 (1)	16*	18* (1)	52*
6-7:30	29	25*	17	71*	13	16	16	45
7:30-9	28 (1)	18	24* (1)	70	20	7	6	33
Peak time interval density: acres per boat	23	26	43	34	37	40	58	47



Boat Trailer Density at the Two Public Accesses: On off-peak days (week days) there was generally capacity for boat trailer parking. On weekends, the access was busy and reached parking capacity from 12 noon to about 6 pm on days with good weather conditions of light wind and no rain. Weather conditions for each time interval are found in Appendix A (Table 10).

Table 10. Number of boat trailers in lots on White Bear Lake in Summer 2024 (from 6:00 am to 9:00pm).

	PEAK DAYS							
	May 27, 2024 (rain part of the day)		July 7, 2024		August 10, 2024		August 24, 2024	
	Ramsey County 40-capacity	Matoska Park 21-capacity	Ramsey County 40-capacity	Matoska Park 21-capacity	Ramsey County 40-capacity	Matoska Park 21-capacity	Ramsey County 40-capacity	Matoska Park 21-capacity
	# of trailers	# of trailers	# of trailers	# of trailers	# of trailers	# of trailers	# of trailers	# of trailers
6-7:30	4	1	8	6	6	1	6	3
7:30-9	10	3	14	9	20	3	15	4
9-10:30	7	3	17	11	25	4	23	5
10:30-12	5	3	27	11	22	7	27	9
12-1:30	5	3	40 full	15	22	5	41 full	15
1:30-3	6	0	40 full	17	22	4	40 full	20
3-4:30	12	6	40 full	13	27	9	41 full	21 full
4:30-6	8	4	40 full	16	30	10	41 full	21 full
6-7:30	4	1	34	18	22	7	39	18
7:30-9	5	1	22	8	11	5	10	5

	OFF-PEAK DAYS			
	July 17, 2024		August 20, 2024	
	Ramsey County 40-capacity	Matoska Park 21-capacity	Ramsey County 40-capacity	Matoska Park 21-capacity
	# of trailers	# of trailers	# of trailers	# of trailers
6-7:30	5	1	3	1
7:30-9	6	4	7	1
9-10:30	13	6	9	2
10:30-12	19	8	9	3
12-1:30	18	5	9	2
1:30-3	20	3	8	3
3-4:30	15	3	10	4
4:30-6	17	4	12	7
6-7:30	21	4	14	5
7:30-9	23	3	10	4

Ramsey County Trailer Capacity: When the sheriff's parking stall is included, the boat trailer capacity is 41. Without the sheriff's stall it is 40.



Figure 7. Parking lot at Ramsey County Park early on a peak sampling day.

4. COMPARISON TO PREVIOUS SUMMER RESULTS

Shoreline Inventory: Results from shoreline boat inventories on 6 occasions from 1999 through 2024 are summarized in Tables 11 through 14. There was an overall increase in the number of riparian boats in 2024 compared to 1999, with numbers decreasing for fishing boats and sailboats. The greatest percentage increase in 2024 was for PWC, pontoons, and kayaks. Paddleboards were also a new category since 2008.

Table 11. White Bear Lake Shoreline Boat Inventory (June 16, 1999, July 24, 2002, June 16, 2004, July 12, 2005 and August 20 and July 17, 2024).

Boat Type	Riparian Boat Inventory (residential and multiple docks)							Percent Change from 1999 to 2024
	1999	2002	2004	2005	2008	2024		
Fishing	144	141	144	121	90	40	-260%	
PWC	27	52	48	68	80	127	+370%	
Runabout	267	354	343	400	336	318	+19%	
Sailboat	179	195	156	180	157	82	-54%	
Pontoon	175	197	189	230	248	368	+110%	
Canoe	73*	123*	136*	161*	192*	43	-41%	
Kayak						349	--	
Paddleboat	18	52	41	51	41	17	-6%	
Paddleboard						133	--	
Sailboard	6	13	15	10	0	0	-100%	
Other (mostly dinghy)	11	0	6	11	11	2	-450%	
ALL CRAFT	900	1,127	1,078	1,232	1,155	1,479	+64%	
<i>(Human powered)**</i>	<i>(91)</i>	<i>(175)</i>	<i>(177)</i>	<i>(212)</i>	<i>(233)</i>	<i>(542)</i>		
POWERED BOATS AND SAILBOATS	809	952	901	1,020	922	937	+16%	

* Canoe category includes kayaks.

** Human powered = canoe, kayak, paddleboat, paddleboard, and sailboard.

Table 12. Marina boat inventory.

Boat Type	Commercial Bay						Matoska Park						WB Yacht Club					
	1999	2002	2004	2005	2008	2024	1999	2002	2004	2005	2008	2024	1999	2002	2004	2005	2008	2024
Fishing	16	1	12	1	12	10	29	37	40	39	32	6	4	3	3	2	2	
PWC		1	1	2		1								1				
Runabout	91	107	100	120	138	133							2	8	3	7	12	10
Sailboat	170	172	155	152	119	36	36	36	28	32	44	23	27	20	24	24	22	52
Pontoon	113	137	150	147	149	304								2				6
Canoe	20			7	3		12	20	14	15	20	17		1	2	2	11	
Kayak						8						14						
Paddleboat								1	1			1		1				
Paddleboard						4												
Other (mostly dinghy)	2						2	4			4	11		4	12	11	2	
TOTALS	412	418	418	429	421	496	79	98	83	86	100	72	33	40	44	46	49	68
<i>(Human powered)*</i>	<i>(20)</i>			<i>(7)</i>	<i>(3)</i>	<i>(12)</i>	<i>(12)</i>	<i>(21)</i>	<i>(15)</i>	<i>(15)</i>	<i>(20)</i>	<i>(32)</i>		<i>(2)</i>	<i>(2)</i>	<i>(2)</i>	<i>(11)</i>	

* Human powered = canoe, kayak, paddleboat, and paddleboard.

Table 13. Total number of boats observed combining riparian and marina locations. Riparian includes all non-commercial craft which means individual lakeshore owners and association docks.

Boat Type	BOAT TOTALS Riparian and Marinas						
	1999	2002	2004	2005	2008	2024	% change 1999 - 2024
Fishing	193	182	199	163	136	56	-70%
PWC	27	54	49	70	80	128	+374%
Runabout	360	469	446	527	486	461	+28%
Sailboat	412	423	363	388	342	193	-53%
Pontoon	288	336	339	377	397	678	+135%
Canoe	105	144	152	185	226	60	-43%
Kayak						371	--
Paddleboat	18	54	42	51	41	18	0%
Paddleboard						137	--
Sailboard	6	13	15	10	0	0	-33%
Other	15	8	18	22	17	13	--
TOTALS	1,424	1,683	1,623	1,793	1,725	2,115	+33%
<i>(Human powered)*</i>	<i>(123)</i>	<i>(198)</i>	<i>(194)</i>	<i>(236)</i>	<i>(267)</i>	<i>(582)</i>	<i>373%</i>

*Human powered = canoe, kayak, paddleboat, and paddleboard.

Table 14. White Bear Lake riparian shoreline structure inventory (1999, 2002, 2004, 2005, 2008, and 2024).

Boat Type	SHORELINE STRUCTURE INVENTORY						
	1999	2002	2004	2005	2008	2024	% Change from 2002 to 2024
Docks	472 (est)	473	472	478	467	476	+1%
Lifts		582	673	765	723	653	+12%
Buoys		21	31	40	28	23	+1%
Rafts		23	21	27	24	4	-82%
Inflatable Rafts		14	14	30	16	8	-43%
Swimming Rafts						4	--
Rave Rafts						3	--
TOTALS		1,113	1,211	1,340	1,258	1,168	+5%
Total Powered Boats*	792	939	881	999	911	935	-0.4%
Powered boats per dock	1.7	2.0	1.9	2.1	2.0	2.0	0
ALL CRAFT	900	1,127	1,078	1,232	1,155	1,479	+31%
All craft per dock	1.9	2.4	2.3	2.6	2.5	3.1	+29%

*does not include canoes, kayaks, paddleboats, sailboards, paddleboards, and dingys

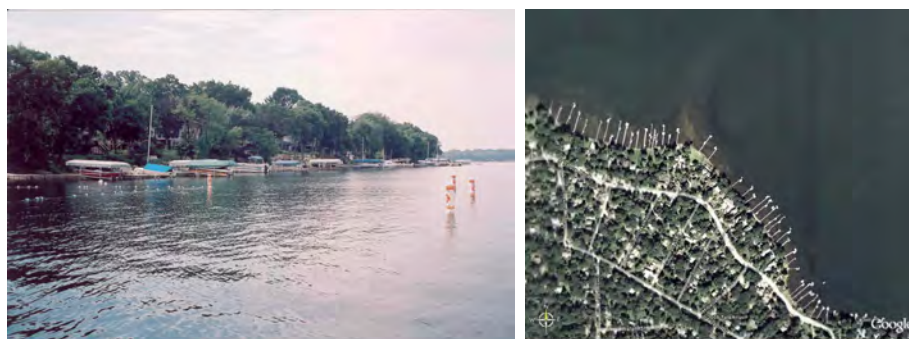


Figure 8. (left) Shoreline structures in Segment D (left) on July 12, 2005. (right) Example of dock density on the White Bear Lake shoreline for Segment E (Google Earth).

Daily Boat Launchings: Daily boat launching observations were conducted in 1999, 2002, 2005, and 2024. For comparison, peak days in 2024 were selected to compare to previous peak day observations. MnDNR inspection records for launches in 2024 on Memorial Day weekend and July 4th weekend peak days are less than previous years but within range for the other 2 peak days. Cloudy weather with intermittent rain occurring through the afternoon would decrease launchings significantly as was the case on August 3, 2002.

For off-peak days, boat launches appear to be somewhat constant for the years of study from 1999 to 2024. The poor weather days may have reduced launches.

Table 15. Boat launching per day for 1999, 2002, 2005 and 2024. Number in parenthesis is the number of boat launchings recorded for the day.

	1999 (6:00 am-9:00 pm) Boats/hr	2002 (9:00 am-6:00 pm) Boats/hr	2005 (6:00 am-9:00 pm) Boats/hr	2024 (various hours from MnDNR inspections) Boats/hr
Peak Days				
1.	May 30 (Memorial-Sunday)	May 27 (Memorial-Monday)	May 28 (Memorial-Saturday)	May 25/26/27* (Sat/Sun/Mon)
Ramsey County	10.4 (156)	8.1 (121)	4.9 (74)	6 (42)
Matoska Park	10.5 (158)	8.8 (132)	5.2 (78)	2.6 (18)
Commercial Bay	19.7 (295)	11.7 (175)	5.3 (80)	1.8 (29)
TOTAL	40.6 (609)	28.5 (428)	15.5 (232)	10.4 (89)
			June 25 (Saturday)	
Ramsey County	--	--	9.6 (144)	
Matoska Park	--	--	10.5 (157)	
Commercial Bay	--	--	16.9 (254)	
TOTAL	--	--	36.9 (554)	
2.	July 4 (Sunday)	July 6 (Saturday)	July 2 (Saturday)	July 4/5/7 (Thurs/Fri/Sun)
Ramsey County	10.5 (157)	5.8 (87)	10.9 (164)	1.9 (13)
Matoska Park	11.1 (166)	7.6 (114)	9.8 (147)	3.1 (31)
Commercial Bay	24.5 (367)	11.5 (173)	13.7 (206)	9.8 (147)
TOTAL	46 (690)	24.9 (374)	34.4 (517)	14.8 (191)
3.	July 31 (Saturday)	July 27 (Saturday)		July 13 (Sat)/Aug 10 (Sat)
Ramsey County	7.7 (116)	4.1 (62)	--	7.2 (65)
Matoska Park	8.3 (123)	3.1 (47)	--	1.6 (11)
Commercial Bay	13.4 (201)	7.9 (118)	--	7.5 (113)
TOTAL	29.3 (440)	15.1 (227)	--	16.3 (189)
4.		August 3 (Saturday)*	August 13 (Saturday)	August 24/25 (Sat/Sun)
Ramsey County	--	1.5 (22)	5.3 (80)	8.1 (73)
Matoska Park	--	0.7 (11)	3.9 (58)	6.3 (19)
Commercial Bay	--	3.8 (57)	5.3 (79)	13.5 (202)
TOTAL	--	6 (90)	43.4 (217)	27.9 (294)
Off Peak Days				
1.	May 26 (Wednesday)			
Ramsey County	4.1 (62)	--	--	-
Matoska Park	4.3 (64)	--	--	-
Commercial Bay	5.5 (82)	--	--	-
TOTAL	13.9 (208)	--	--	-
2.	June 16 (Wednesday)	July 24 (Wednesday)	July 12 (Tuesday)	July 17 (Wednesday)
Ramsey County	2.3 (43)	1.2 (18)	6.7 (101)	5.2 (47)
Matoska Park	1.7 (26)	0.9 (14)	4.3 (64)	2 (6)
Commercial Bay	2.1 (31)	0.9 (13)	4.1 (61)	6.4 (96)
TOTAL	6.7 (100)	15 (45)	15 (225)	13.6 (151)
3.	August 11 (Wednesday)	July 31 (Wednesday)	August 10 (Wednesday)	August 19/20/28 (Mon/Tues/Wed)
Ramsey County	5.3 (80)	3.7 (56)	4.7 (71)	2.7 (19)
Matoska Park	2.6 (39)	2.7 (40)	3.5 (53)	1.6 (8)
Commercial Bay	2.5 (37)	3.3 (49)	3.9 (59)	3.3 (49)
TOTAL	10.4 (156)	9.7 (145)	12.2 (183)	7.6 (72)

*Memorial weekend had threat of bad weather with some rain. Inspections did not occur during rainfall periods.

Boat Launchings for Each Time Interval: The boat launching patterns for the highest rate of launches were somewhat similar for 1999, 2002, and 2005 although there was an apparent decrease in 2024 (Table 16). Inspection records in 2024 for peak days occurred over 50 days but inspections did not occur for the entire 15-hour day. Also, both accesses were not always staffed at the same time. Therefore boat launch numbers for 2024 are likely under counted compared to launch rates from 1999, 2002, and 2005. However, overall, boat launchings were lower. Even if the 2024 peak day boat launch numbers are doubled, launches are still less than the full day launch numbers from 1999 and 2005. Over the 50 days of boat inspections on peak days in 2024, inspections did not occur during rain events, but boat launching inspections could have been lower due to a threat of rain.

Table 16. Average number of launches for each time interval in 1999, 2002, 2005, and 2024. Gray shading indicates highest launches for a time interval. Although inspections did not occur during rain events, boat launching numbers could be lower with a threat of rain. In 1999 and 2005, there were optimal conditions for lake use.

	Peak Day (average)								Off Peak Day (average)							
	Two Accesses (City and County)				Commercial Bay				Two Accesses (City and County)				Commercial Bay			
	1999	2002	2005	2024 (DNR) (n=50 days)	1999	2002	2005	2024 (n=3 days)	1999	2002	2005	2024 (DNR) (n=64 days)	1999	2002	2005	2024 (n=2 days)
6:00-7:30	25	--	26	5	4	--	5	2	8	--	6	4	0	--	1	1
7:30-9:00	17	--	24	8	6	--	8	9	10	--	8	6	1	--	4	5
9:00-10:30	36	26	20	12	20	12	10	9	10	8	10	7	2	6	4	2
10:30-12:00	40	36	28	12	38	32	21	17	10	4	12	9	4	3	4	3
12:00-1:30	43	36	34	22	59	35	23	22	10	12	16	8	6	3	10	7
1:30-3:00	39	28	28	12	57	26	27	32	14	10	18	8	8	4	5	8
3:00-4:30	31	14	26	10	33	18	19	26	16	20	20	9	10	8	8	11
4:30-6:00	25	9	20	7	26	9	19	26	30	14	28	14	13	9	11	16
6:00-7:30	25	--	18	1	21	--	18	11	23	--	26	--	15	--	9	22
7:30-9:00	9	--	4	no data	22	--	3	3	2	--	4	--	5	--	6	3
TOTAL	290	149	226	79	286	132	153	157	133	68	148	65	64	33	62	75



Figure 9. Ramsey County Public landing is a busy place on a peak day in 2005. This landing was busy in 2024 as well.

Types of Boats Launched: The types of boats launched into White Bear Lake on peak days were somewhat similar in 2024 compared to 1999 although there were increases in pontoon and wakesport launches (Table 17). For off-peak days, percentages were slightly different from 1999 to 2024. The percentage of fishing boats launched was higher and the percentage of runabouts was lower in 2024 compared to 1999. In 2024, pontoon and kayak launches increased but there were fewer sail boats and canoes launched. Because watercraft definitions for fishing boats were different in 2024 compared to 1999, 2002, and 2005, we combined the fishing and runabout category (Table 17). There may be a slight decrease in this combined category in 2024 compared to previous years. The increase in pontoon launches in 2024 is a factor.

Table 17. Types of boats on White Bear Lake in 1999, 2002, 2005, and 2024. Based on all boats launched from Ramsey County landing, Matoska landing, and Commercial Bay.

	Peak				Off Peak			
	1999 (6am-9 pm)	2002 (9 am-6 pm)	2005 (6 am-9 pm)	2024 (6 am-9pm)	1999 (6 am- 9pm)	2002 (9 am-6 pm)	2005 (6 am-9 pm)	2024 (6 am-9 pm)
Fishing	13%	7%	18%	23%	30%	8%	15%	43%
Kayak/Canoe	0.3%	1%	0.7%	0.7%	0.5%	3%	3%	0.7%
PWC	4%	7%	4%	5%	5%	7%	3%	6%
Runabout	52%	54%	44%	33%	42%	57%	56%	23%
Sail	14%	16%	12%	2%	10%	7%	6%	2%
Pontoon	16%	13%	17%	28%	10%	16%	13%	18%
Waterski/ Wakesport	0.7%	1%	4%	9%	2%	1%	4%	5%
Other	0.7%	1%	0.3%	0.3%	1%	1%	0%	0.9%
Fishing and runabout combined	65%	64%	62%	56%	72%	65%	71%	66%

Lake Boat Density: Peak day boat density, given as lake acres per boat, has a slightly declining trend since 2005. A higher boat density has been observed in the North “bay” for both peak and off-peak days over all surveys (Table 18).

Table 18. White Bear Lake boat counts were taken over 10 time periods in a 15-hour day for peak and off-peak days. Boat counts were taken in three sectors for each time period. The numbers reflect the average for peak and off-peak days of the maximum boat counts for a time interval during the day.

	1999		2005		2024		1999		2005		2024	
	PEAK (3 days)		PEAK (3 days)		PEAK (3 days)*		OFF-PEAK (3 days)		OFF-PEAK (2 days)		OFF-PEAK (2 days)	
	# of boats	ac/boat	# of boats	ac/boat	# of boats	ac/boat	# of boats	ac/boat	# of boats	ac/boat	# of boats	ac/boat
North Bay (739 ac)	75	10	46	16	67	11	26	28	35	21	26	28
South Bay (1,036 ac)	60	17	57	18	37	28	30	35	22	47	33	31
West Bay (645 ac)	41	16	40	16	32	20	20	32	23	28	21	31
Whole lake (2,420 ac)	176	14	143	17	136	18	76	32	80	30	80	30

*May 27, 2024, Memorial Day-Monday data not included.

Aquatic Invasive Species Considerations Based on MnDNR Boat Inspection Records for 2024

Table 19. Boats entering White Bear Lake from lakes that currently have a starry stonewort presence (based on MnDNR inspection records).

Total number of boats entering WBL: 2,184 boats		
Boats Entering from a Lake with Starry Stonewort	County	Number of Boats From Lakes with Starry Stonewort
Beltrami	Beltrami	1
Carnelian	Stearns	4
Cass	Beltrami	2
Koronis	Stearns	1
Leech	Cass	9
Medicine	Hennepin	5
Pokegama	Pine	1
Thunder	Cass	1
Winnibigoshish	Cass	4
Total		28
Percentage of boats entering WBL from a lake with SSW		1.3%

Table 20. MnDNR boat inspection data for White Bear Lake.

Total number of boats leaving WBL	1,022
Number of boats with plants	224
Number of boats with zebra mussels	14
Percent of boats with plants	22%
Percent of boats with zebra mussels	1.4%



Figure 10. An inspector at the Ramsey Beach access on August 24, 2024.

5. HOMEOWNERS AND BOATERS SURVEYS

5.1. Homeowners Survey

A homeowners survey was mailed to 100 randomly selected White Bear Lake shoreland owners in September 2024 and 35 responses were mailed back. In addition, 50 responses were submitted online accessed via a QR code provided on the paper survey. Also, the survey with a QR code was published in the Laker newspaper and posted on the WBLCD website, Instagram, and Facebook. The percentages reported below are based on 85 respondents. This compares to 34 responses in 2005 and 37 responses of 100 surveys that were mailed in 1999 and in 2005.

[Directions sent out with the survey.] *The White Bear Lake Conservation District is updating a lake user survey. A similar survey was conducted in 2005. You may respond and return to the WBLCD at 4701 Highway 61, White Bear Lake, MN 55110 or online (QR code to the right). Results will be published on the WBLCD website. Thank you.*

1. How many years have you: lived or leased a slip on White Bear Lake?

	Lived on White Bear Lake			Leased a slip
	1999*	2005*	2024*	2024*
1 – 4	6%	9% (3)	8% (7)	18% (15)
5 – 9	6%	9% (3)	14% (12)	8% (7)
10 – 14	20%	12% (4)	8% (7)	5% (4)
15 – 19	6%	6% (2)	6% (5)	
20 – 24	3%	3% (1)	5% (4)	
25 – 29	20%	21% (7)	6% (5)	
30 – 34	11%	15% (5)	7% (6)	
35 – 39	11%	6% (2)	6% (5)	
40+	17%	24% (8)	15% (13)	

In 2024, the most common length of time of living on WBL was 5 to 9 years (14%) and 40+ years (15%).

*Based on responses received.

2. What types of watercraft do you typically utilize on White Bear Lake (lake residents can use more than one type of watercraft). Number in parenthesis is the number of craft.

	1999	2005	2024
Fishing boat	46%	44% (15)	14% (12)
Sailing boat	43%	35% (12)	22% (19)
Sailboard, Kite Board, Hydrofoil			21% (18)
Canoe/Kayak	35%	38% (13)	42% (36)
Kayak			27% (23)
Pontoon	46%	38% (13)	65% (55)
PWC	0	9% (3)	25% (21)
Ski boat	27%	29% (10)	26% (22)
Tow Boat (wake, surf)			14% (12)
Runabout	43%	38% (13)	15% (13)
Paddleboard			34% (29)
None	--	6% (2)	1% (1)

In 2024, pontoons and kayaks were the dominant watercraft used by lake residents. Fishing boat usage was down compared to 1999 and 2005 surveys.

3a. What is your typical pattern of usage on White Bear Lake?

Range of Days/week = 0-7.

	1999	2005	2024
Days/week (average)	3.1	3.2	2.7

Similar usage in 1999, 2005, and 2024.

3b. What is your typical pattern of usage on White Bear Lake? (Numbers in parentheses are actual number of responses for questions 3b, 4, and 5).

	2005	2024
Morning	35% (12)	24% (20)
Mid-day	47% (16)	38% (32)
Evenings	82% (28)	40% (34)

In 2024, mid-day and evenings are close. In 2005, it was evenings.

4. Are there specific circumstances or conditions when you tend to avoid using White Bear Lake?

	1999	2005	2024
Holidays	8%	47% (16)	34% (29)
Weekends	47%	24% (8)	27% (23)
Inclement Weather	17%	65% (22)	84% (71)
Nighttime	3%	18% (6)	34% (29)
Various	6%	3% (1)	7% (6)

Bad weather keeps residents off the lake in 2024. In 1999, it was the crowded weekends.

5. What are your primary activities on White Bear Lake?

	1999	2005	2024
Swimming	24%	65% (22)	49% (42)
Fishing	24%	32% (11)	32% (27)
Pleasure boating	27%	76% (26)	86% (73)
Sailing	16%	29% (10)	22% (19)
Water skiing, wake boarding or wake surfing	--	--	21% (18)
Skiing/tubing	30%	29% (10)	--
Pontoon	27%	35% (12)	--
Canoe/kayak	5%	21% (7)	--
Aesthetic/enjoyment	27%	71% (24)	--
Winter uses	5%	38% (13)	--

Pleasure boating is popular in 2024.

6. Do you have any concerns regarding how others use White Bear Lake?

Comments from 2024.

Wake boats

- I'm not a fan of wakeboarders due to their disruptive wake, it really throws around small sailboats.
- The wake boats are a huge problem for the lake ecology as well as for safety.
- Some of the wakeboarding boats are eroding the shorelines.
- The power boats built to produce a big wake are a hazard to all others.
- Surf boats coming too close to shore and damaging beachfront with their wake.
- Wake boats/runabouts come too close when fishing.
- The big wake boats are a nuisance. They should be banned from lakes that have small boats.

Rental boats

- Rental boats (and others) with drivers who don't know/understand boating rules.
- Excessive number of slips and rentals that create too much traffic for the size of the lake.
- Too many slips in commercial bay that lead to safety issues.
- Many rental drivers seem unfamiliar with boats and lakes and boating laws. They also don't know things to avoid.
- I am concerned with boat rentals not ensuring that the drivers have completed boat safety if born on or after 1976.
- Seems like a lot of them don't know approach rules.
- Rental boats seem more frequently oblivious to safety and regulations.

Overcrowding

- Lake is getting too crowded on weekends and holidays. Disregard for right of way rules. People get too close to other people.
- The lake can be so densely populated with boats some weekends it makes it difficult to enjoy the lake.
- Seems more and more crowded out there especially on weekends

Unsafe Conditions

- Jet skis and tubers who follow our surf boat with surfer and jump the wake creating a potentially dangerous situation when the surfer goes down.
- People get too close to other people.
- Boats without lights on at night.
- Excessive drinking by boaters, especially on weekends and holidays.
- Motor boats not observing speed limits or safe distance from other boats.
- Boaters driving too close to other boaters. Boaters who lack awareness of those around them.
- Excess speed on White Bear Lake - most times it feels like teenagers.
- Unsafe and inconsiderate boaters, boating at high speeds not being vigilant of others.
- Boaters are unsafe and don't follow lake laws.
- Boats without lights after dark.
- We see a lot of jet skiers who appear to be amateur and not understand the rules of driving a jet ski. For example, jet skiers, trying to jump the wave behind someone who is surfing or tubing. It is very dangerous.
- Jetskis too fast.
- Boater safety is not followed or enforced (too close to skiers).
- Alcohol use and speeding too close to boats.
- People using the lake as a toilet.

Noise

- Loud music.
- Wake boats are the rudest boaters with their massive sound systems that can be heard for miles.
- A strict noise ordinance needs to be in place for these boats with ridiculous sound systems.
- Some play their music too loud and some use too much alcohol.
- Wakeboard boats blast music so loud that it can pause conversations on shore.
- Too many noisy speakers.
- Wakeboard boats play music at unreasonable levels.

Fishermen

- Fishermen who hit/bump into our dock and boat lifts and hook their lines on our stuff leaving hooks exposed in areas we walk.
- Rude fisherman that fish right up next to our dock and boatlifts and cast lures and snag them on everything and then when you politely ask them to leave, they swear curse and yell at you!
- The behavior from some of the fisherman out on White Bear Lake is absolutely appalling.
- Many fishermen do not respect peoples property and cast lines onto personal property and cause damage to lifts, boats, docks.
- Fishermen-very disrespectful near our docks and lifts - getting too close and snagging lures and damaging belongings and getting on our dock.
- Fishing boats park at end of docks and sit for too long, fishing boats and pontoon disregard boats pulling skiers.
- Lots of trash left by younger fishermen.

Other

- When lake is low, concern when people don't understand or respect the buoys.
- Unfamiliar with rules or safety expectations; shallow areas.
- Townies come too close to my dock.
- Boats traveling way too close to shoreline.
- Boats coming too close to homeowner docks.
- Concerned about boats being stored on lake shore property - unsightly and against ordinance.
- Loud motors, wake boats causing waves and erosion; carp trollers at night with bright lights, loud music, fireworks, float planes are excessive.
- Jet skis are out of control; wake boats destroy underwater ecosystem.
- Reckless use of jet skis, boats traveling at wake speed near shoreline.
- Lake shore erosion and water pollution from yard run off.
- Float planes are excessive.

7. Are you familiar with the lake ordinances*? If yes, do you find the lake ordinances to be:

	1999	2005	2024
Yes	38%	62% (21)	82% (70)
No	16%	24% (8)	13% (11)
Overly Restrictive	8%	0	4% (3)
Appropriately balanced	not asked	not asked	61% (52)
Not Restrictive Enough	30%	29% (10)	12% (10)

Most of the boaters are aware of lake use ordinances.

*Numbers in parentheses are actual number of responses returned. Same for questions 8, 9, and 10.

8. What is your perception of enforcement efforts on White Bear Lake.

	1999	2005	2024
Unaware of	46%	3% (1)	Question not asked
Insufficient	--	38% (13)	14% (12)
Adequate	32%	56% (19)	76% (65)
Excessive	3%	3% (1)	1% (1)

Enforcement is adequate.

9. Do you find the lake to be crowded at certain times? If yes, do you notice any particular type of watercraft causing congestion or disturbance?

	1999	2005	2024
Yes, weekends	43%	74% (25)	not specified
Yes, evenings	3%	3% (1)	not specified
Yes	43%	74% (25)	81% (66)
No	24%	6% (2)	17% (14)

	1999	2005	2024
PWC	32%	53% (18)	28% (15)
Powerboats	11%	26% (9)	1% (2)
Waterskiers/Wakeboats	5%	9% (3)	33% (18)
Pontoons	3%	3% (1)	1% (3)
Noisy craft	3%	41% (14)	
Sailboats			1% (3)

The perception is WBL can be crowded.

Jetskis (PWC) and wakeboats raise concerns in 2024 based on comments.

10. Have you ever felt unsafe while on White Bear Lake? If yes, please list details.

Comments from 2024.

	2024
Yes	40% (34)
No	56% (48)
No response	4% (3)

Driver Inattention / Lack of Experience

- Inexperienced boaters constantly causing dangerous conditions.
- Other boats crossing in front of our boat or being right next to us while we are surfing.
- PWC driving to close and fast to the personal docks.
- I don't feel like we can canoe anywhere but near shore as drivers are not paying attention.
- Aggressive boaters driving too close, especially too close to sailboats, inattentive boaters towing children on tubes.
- People not knowing who has right of way. I have watched boats drive right into marked swim areas.
- Most boaters don't seem to understand anything about boating safety or right of way. Boats towing tubers and wake boarders are the worst for ignoring traffic and going too close to other vessels. Jet skis are a big problem (reckless behavior) but seem a little less popular lately.
- Do not understand boating regulations and or may not understand that their boat is not a car. Usually, I have problems if I am pulling someone tubing or wake surfing and someone starts following me quite closely and it's like they don't understand that the person I am towing could fall at any moment.
- Boats too closely following when a skier, boarder, surfer in tow.
- PWC too close to our boat/skier.

Jumping Waves

- Jet skiers, who try to jump the waves behind kids who are surfing or tubing. If somebody falls off the tube, that turns into a potentially dangerous situation. We have witnessed this multiple times.
- Jetskis and other boats following too close because they want to jump our wake.
- Nearly every time we are out surfing we have jet skis or tubers following too close and for too long to jump our wake. We try to wave them off but often have to stop and wait for them to leave.

High wakes

- High wakes shaking boat.
- Wake boat chop is dangerous.

Lights Off

- When boating at or after dusk, there are often other boats without their navigation lights on which is very unsafe.
- I think the buoy markers could have solar lights (soft) to better mark the rock areas.

High Speeds

- Boaters driving too fast in congested areas.
- Other boats driving too fast in the path of an oncoming boats.
- During kayaking with speed boats.

Holidays

- Fourth of July after fireworks, and some very windy days'.
- 4th of July is a nightmare.
- Drunken boaters after fireworks.

11. Are there any aspects of the lake's condition that worry you in relation to your use of the lake? Comments from 2024.

Lake Levels

- Low water levels (7 comments).
- Low water exposing underwater rocks.
- The water level fluctuates too much.
- Just the water levels but those are looking good again!
- Shallow waters.
- I worry about the lake level and if it continues to get busier and busier.
- Water still too low. With all the rain we have had we are surprised we have still had to extend our dock out. We feel the DNR is still taking from the lake and are not happy about it.
- Lake levels are not going to hold up. The DNR and the State have been found at fault for this in the State's highest court. We need to expedite an actual fix instead of funding Met Council studies for years. Please help advocate for real progress and not more government foot-dragging.
- Changing water levels and milfoil.
- Plant growth went up when lake levels went down.
- As the lake has gone down, aquatic vegetation has come up. It's getting hard to boat in our bay. Again, a fix is needed for the water level issues and we can't wait decades for government studies.

Aquatic Life

- Weed growth, milfoil, zebra mussels.
- Sea weed in the marina gets tangled up on my keel and rudder.
- I stopped fishing it because there no fish anymore.
- The milfoil remains out of control despite the Conservation District's efforts. Surely progress can be made in effective eradication.
- The weeds.
- Milfoil.
- Inadequate weed control, especially milfoil.
- The lake is overrun with milfoil and the annual treatments are always too little and too late. Weeds pretty thick later in the season.
- Sailing is ruined by the huge areas of milfoil matted at the surface.
- The weeds can limit swimming and other lake activities.
- Milfoil and ZM. Glad they are still treating milfoil.
- Spread of milfoil.
- Zebra mussels, water quality, milfoil.
- Too much wake boarding. Its destroying the vegetation. No weeds within 30ft of shore anywhere. I stopped fishing there no fish now.
- Weed growth on south shore is horrendous
- The constant large wakes from wake boats cause a large amount of turbulence at the shoreline. There are no longer any minnows near my dock as in decades past and I suspect they can't live in that turbulent environment.
- Our Shoreline has become very mucky and many weeds washed up on our shore, starting to see some snails as well. Canadian geese population is bad and unhealthy for our lake as they defecate on our dock and Neighbors docs and water trampolines. Neighbors will brush it off into the water which can cause disease. We do not, but we have to clean off our dock often really hard to get rid of them! Very frustrating and they are mean!
- I witnessed a nesting loon site that was washed away due to high waves. In Halls Marsh the abundance of invasive purple loosestrife continues to take over the cat tails. Seems that it is affecting the bird life (less yellow winged black birds). Perhaps there is a treatment for this.
- Wildlife nesting options have been challenged.
- Not enough native habitat/natural shoreline; wish you could encourage homeowners to adopt more natural shoreline.

Unsafe Conditions

- People not knowing the rules or driving unsafe.
- Too many boats, lack of education/knowledge/adherence to safe boating rules and practices.
- The lake is very shallow in spots and dangerous for boating, not enough buoys out.
- Shallow or rocky areas could be marked a little more clearly.

Boat Related

- Erosion due to wakeboard boats.
- Disruption of the lake bottom due to excessive wake.
- Targeting wake surfers for making large wakes is shortsighted - the large runabouts pulling tubers create more wake.
- I have found that the wind can cause more damage to the shoreline than the boating traffic.

Other

- Trash in the lake.
- Landscaping with rock and building secretly new structures at the lakeshore.
- I think there should be more buoys, and possibly light up buoys for evening time, along the rock bar at Ordway point. We hear people crashing on that quite often at night.
- Would like to see more opportunities and support (rules and \$) for homeowners that want to help with invasive species control.
- RC should provide a lifeguard at county beach; WB should do the same at memorial park; dogs on leash at dog beach is Ridiculous ordinance.
- Fertilizer from private land running into lake; unfiltered flowage, wake board shoreline erosion.
- The DNR's over zealous restrictions on attempts to keep weeds under control on shoreline.
- Bacteria levels.
- Our shoreline is a terrible mess of muck.

12. Have you observed any water quality issues or shoreline erosion problems on White Bear Lake?* If yes, please elaborate. Elaborations included in above/below comment sections.

	2024
Yes	11% (19)
No	60% (51)

*Based on responses received.

13. Do you have any concerns regarding the safety or impact of winter activities on the frozen lake surface?* If yes, please explain.

	2024
Yes	26% (22)
No	68% (58)

*Based on responses received.

- Sometimes there are snow plowed piles that are difficult to see when snowmobiling.
- Ice fisher people leave trash all over.
- The ice fisherman seem to think it's OK to leave their garbage all over the lake. If it wasn't for the Boy Scouts spring cleanup, we would have all kinds of garbage and debris, and who knows what else dumped into the lake when it melts.
- Snowmobile driving way too fast.
- Trash from ice fisherman, high speeds of vehicles, shady activities on ice.
- plowed roads on the ice should be marked.
- excessive speed of snowmobiles and ATVs; dog poop.
- speeding snowmobiles.

14. How likely are you to recommend spending time on WBL to a close friend or colleague? (1=Not likely, 10=Very likely).*

	2024
1	5% (4)
2	
3	20% (2)
4	
5	4% (3)
6	20% (2)
7	8% (7)
8	14% (12)
9	7% (6)
10	52% (44)

*Based on responses received.

15. Please include other comments.

Sailboats

- Sailboats have organized events several times per week on the lake. These organized events place the buoys near the shoreline which make it difficult for other traffic to navigate around. Also boats that are watching races congregate in this area making the area even more congested. The horns that are used for sailing events are excessive and a disturbance to others on the lake.
- Sailboats can be a problem in organized events several times a week. The markers are spread out using most of the area of that part of the lake. This makes it difficult for a boat to navigate around, especially when there are several spectator boats for the organized sailing events.
- Sailboats seem to be out in large groups racing almost every week night.

Launches

- County Launch is a complete mess. All the time. Have to get a residential launch pass at the City Matoska park annually if we have the chance to cut into the chaos at the county launch.
- The people who check your boats are a waste of time. They clog up the landing & do a poor job inspecting or enforcing anything. Always on there cell phones.
- It is very unfortunate that WB Lake only has 4 public beaches, 2 public launches, and the only public marina is jammed into tight shore front with inadequate parking for busy times. It seems as though residents of the lake have become more aggressive with trying to tell boaters they cannot anchor within 10ft of shoreline- specifically on the north side of Manitou Island where they keep adding “swim areas” in an effort to keep the shallow waters to their own use.
- We love WBL and feel so very fortunate to be able to live on it and have it to use, but are getting increasingly concerned with the lack of respect and over usage.

Boat Related

- I think the spotter requirement rule is overly restrictive. Sometimes the lake can be sparsely used during the restricted times. I think the spotter idea is great for busy times, but not when the lake is not being used very much.
- Surf boats are not the only source of big waves. As long as everybody is respectful and stays a reasonable distance from the shoreline and others, no one activity or boat should be blamed for waves.
- Most people seem to be polite and considerate operators of boats on white bear lake in my experience. I don't believe wakeboarders intend to be inconsiderate but the wake just spreads so far and is so disruptive that I find them highly annoying.
- It would be nice if the perpetual Tally's/Admiral D's dock drama could be minimized. I checked the box indicating that lake ordinance enforcement was excessive but then also asked for more regulation of wakeboard boat music. That probably seems conflicting. While I want more noise enforcement, the seemingly random checks because one person happens to be leaning on a gunwale are indeed excessive. Unless boats are doing something truly egregious, just leave them alone. It feels like we are always under the microscope out there and it ruins the experience 99% of boaters might be violating some tiny rule, but let's be reasonable about pulling everyone over for a nothing issue just to shake them down for all the other things like having or not having a paddle or a throwable. Feels very oppressive at times.

Positive Feedback

- Thank you for your hard work.
- I love this lake! Thanks for all that your group does!
- Thank you for conducting this survey.
- Thank you for your efforts!
- Beautiful lake (2).
- Love this lake.
- I think Ramsey County Sheriffs Office is one of the finest agencies in the Metro Area of MN. And we are lucky to have them on White Bear Lake in our area.

Recommendations

- As a homeowner who pays any taxes, we do not feel there should be a restriction of only four watercraft on one dock.
- Lake levels are a growing concern especially for owners in shallow areas; maybe adjust overflow level to Bald Eagle.
- Lake level continues to be a problem; hoping someday they augment the lake.
- Keep the water levels at correct depth and aquifer full.
- Enforce 100 ft from homeowner docks and the lawsuit against DNR for water levels.
- Request buffer zones that are adequate between grass and shoreline, too many boats for small lake, noise and wake ordinances need to be enforced.
- The most important duty of the WBLCD should be to maintain a reasonable water level.
- Regulate companies that offer "shoreline cleaning" - need to encourage natural landscaping.
- Handout for daily boat renters with boating regulations.
- The city removing the cleats from their docks in "commercial" bay is just plain wrong. We need a spot for short term docking to visit the restaurants and businesses. That's what commerce is all about. The city should be focused on providing access to the public not hindering access.
- The WBLCD needs to step up and begin managing the lake like it matters, because it does. I do appreciate the volunteer effort, but we need to stop pleasing all the folks bent on ruining the lake experience for others and put policies in place that make visiting WBL a safe and enjoyable experience for all. 1) Noise ordinance 2) No wake zones 3) Expanded Milfoil treatment program 4) Rigorous enforcement.
- It would be great to have better trash collection on white bear lake during the winter months so less garbage melts into the lake during the spring. Can't we put some trash bins out?
- Try to control the limit of trailers parked all over neighborhood people cutting through yards.
- Please address the milfoil. Eradication is within reach. It can be done. Everyone wants it done.
- It would be great if the rental boats made the renter take a quick boaters safety/etiquette class.
- We need a sound ordinance that is enforced.
- I'd like to see catch and release regulations for largemouth and smallmouth bass. Also, restricting wakeboats from operating with full ballast in less than 15ft of water.

5.2. Boaters' Exit Survey

Boater exit surveys were conducted randomly at the Ramsey County access during four survey dates and 42 surveys were completed. The results are shown below.

1. How many hours did you spend on White Bear Lake today?

	Ramsey County Beach
Average	3 hours
Range	0.5 – 7 hours

Of the survey respondents, nearly half spent 3 or more hours on the lake.

2. How frequently do you visit White Bear Lake each year?

	Ramsey County Beach
Average	17 visits
Range	1 – 60 visits

Of the survey respondents, there were three first time visitors to WBL. Roughly half of the respondents visit WBL at least once a week.

3. What is the approximate distance between your residence and White Bear Lake? (miles)

	Ramsey County Beach
Average	15 miles
Range	0 miles – 35 miles

4. Where did you park? (In a nearby lot or not in a lot)

100% of respondents parked their vehicle in the Ramsey County access parking lot or live on White Bear Lake.

5. What was the primary activity you engaged in during your time on White Bear Lake?

Ramsey County Beach
Fishing: 71%
Pleasure: 14%
Sailing: 2%
Waterskiing: 2%
Kayak: 2%
Other: 8%

6. What factors influenced your decision to choose White Bear Lake as your destination?

Reason for Visit	
Close/nearby	36%
Fishing	69%
Water Quality	12%
Size (suitable for sailing)	2%
Facilities (marine, beach, rental, etc.)	2%
Other	14%

Other factors included a good boat launch, a pretty lake and familiarity.

7. Enforcement: Did you see any water patrol today?

	2024
Yes	2%
No	98%

8. In your opinion, is White Bear Lake adequately marked to indicate obstacles and shallow areas?

	2024
Yes	88%
No	12%

- “No, hit a rock pile.”
- “could do better; more markers around rocks.”
- “wish there were more markers.”
- “more buoys for rock bar; previously hit rocks.”

9. 100% of respondents indicated they owned the boat they used the date of the survey.

10. How likely are you to recommend spending time on WBL to a close friend or colleague? (1 = Not Likely, 10 = Very Likely)

	2024
6	1 (2%)
7	3 (7%)
7.5	1 (2%)
8	14 (33%)
9	8 (19%)
10	14 (33%)
N/A	1 (2%)

APPENDIX A: Trailer numbers at accesses, Commercial Bay boats leaving slips, and lake boat density.

ACCESS ACTIVITY AND LAKE BOAT COUNTS: MAY 27, 2024 MEMORIAL DAY
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Air Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing														
Kayak														
PWC														
Runabout				2	2			2	3	2	7			
Sail														
Pontoon				1	1			1			1			
Waterski									1		1			
Other														
Total	4	1		3	3	0	0	3	4	2	9	Calm	<5	50 cloudy
7:30-9														
Fishing								1			1			
Kayak								1			1			
PWC														
Runabout				1	1	1	1	3	4	3	8			
Sail				1	1			1			3			
Pontoon				2	2			1	1		2			
Waterski														
Other: paddleboard									2		2			
Total	10	3		4	4	1	1	7	7	3	17	Calm	<5	54 cloudy
9-10:30														
Fishing														
Kayak										1	1			
PWC								1		1	2			
Runabout				3	3	1	1							
Sail						1	1	5	2	2	9			
Pontoon				1	1	2	2	1			1			
Waterski								2			2			
Other														
Total	7	3		4	4	4	4	9	2	4	15	Slight chop	<5	59 cloudy
10:30-noon														
Fishing														
Kayak														
PWC														
Runabout								3	3	1	7			
Sail														
Pontoon				1	1	1	1	1	2		3			
Waterski														
Other														
Total	5	3		1	1	1	1	4	5	1	10	Calm to slight chop	<5	59 light rain 10:15-10:50 then sprinkles 11:50
noon-1:30														
Fishing														
Kayak										1	1			
PWC														
Runabout								2		1	3			
Sail														
Pontoon								1		1	2			
Waterski														
Other														
Total	5	3		0	0	0	0	3	0	3	6	Calm no rain	<5	58

ACCESS ACTIVITY AND LAKE BOAT COUNTS: MAY 27, 2024 MEMORIAL DAY
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Air Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
1:30-3														
Fishing										1	1			
Kayak										1	1			
PWC														
Runabout				3	3	1	1	1	1	2	4			
Sail														
Pontoon				7	7	4	4	3	2	1	6			
Waterski														
Other														
Total	6	0		10	10	5	5	4	3	5	12	Calm	5	62 overcast partly sunny
3-4:30														
Fishing								2	1	1	4			
Kayak								1			1			
PWC										2	2			
Runabout				1	1			3	3	4	10			
Sail						2	2							
Pontoon				3	3	7	7	6	4	3	13			
Waterski				1	1	1	1	1	1		2			
Other														
Total	12	6		5	5	10	10	13	9	10	32	Calm	Calm, thunder in distance, dark skies	63 partly sunny dry
4:30-6														
Fishing								1		1	2			
Kayak														
PWC										2	2			
Runabout								2	2	4	8			
Sail														
Pontoon				1	1	2	2	3	1	1	5			
Waterski														
Other														
Total	8	4		1	1	2	2	6	3	8	17	Calm	5-7 Lightening in distance, dry no rain	58
6-7:30														
Fishing								1			1			
Kayak								3		1	4			
PWC														
Runabout				1	1	2	2	2		4	6			
Sail														
Pontoon						2	2			2	2			
Waterski								1			1			
Other														
Total	4	1		1	1	4	4	7	0	7	14	Calm	<5 calm clearing	56
7:30-9														
Fishing										1	1			
Kayak								3			3			
PWC														
Runabout						1	1	3	2	4	9			
Sail														
Pontoon						1	1	2	1	1	4			
Waterski									2	1	3			
Other														
Total	5	1		0	0	2	2	8	5	7	20			

ACCESS ACTIVITY AND LAKE BOAT COUNTS: July 7, 2024 July 4th Weekend
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing				1	1			1			1			
Kayak					0					1	1			
PWC					0						0			
Runabout				1	1			2	5	5	12			
Sail					0						0			
Pontoon				2	2						0			
Waterski					0						0			
Other					0						0			
Total	8	6	14	4	4	0	0	3	5	6	14	calm no wave	<5	66 sunny
7:30-9														
Fishing					0			2	2	3	7			
Kayak					0				3	4	7			
PWC					0			1		1	2			
Runabout					0			3	6	3	12			
Sail					0						0			
Pontoon				3	3			2	4	1	7			
Waterski					0				1		1			
Paddleboard					0			18		1	19			
Total	14	9	23	3	3	0	0	26	16	13	55	calm no wave	<5	67 sunny to partly cloudy
9-10:30														
Fishing								2	3	3	8			
Kayak								1	2	3	6			
PWC								1			1			
Runabout				3	3			5	8	4	17			
Sail										1	1			
Pontoon				5	5			4	1	4	9			
Waterski											0			
Paddleboard									3		3			
Total	17	11		8	8	0	0	13	17	15	45	calm to slight chop	<5-10	69 partly cloudy
10:30-noon														
Fishing								2	1	1	4			
Kayak									5	1	6			
PWC								1	2	1	4			
Runabout				8	8	3	3	9	8	9	26			
Sail											0			
Pontoon				8	8	3	3	6	4	5	15			
Waterski									3	2	5			
Other											0			
Total	27	13		16	16	6	6	18	23	19	60	calm with slightly boat chop	5-10	74 partly cloudy

ACCESS ACTIVITY AND LAKE BOAT COUNTS: July 7, 2024 July 4th Weekend
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
noon-1:30														
Fishing										6	6			
Kayak										5	5			
PWC								1	2	3	6			
Runabout				5	5	3	3	9	27	10	46			
Sail				1	1			2	1	2	5			
Pontoon				14	14	16	16	5	3	10	18			
Waterski									3	11 (wake) 11 (ski)	25			
Paddleboard								2			2			
Total	39 full	15		20	20	19	19	19	36	47	102	slight to moderate boat chop	5-10	77 partly cloudy
1:30-3														
Fishing									1	1	2			
Kayak										6	6			
PWC								3	2	3	8			
Runabout				12	12	5	5	7	9	17	33			
Sail				1	1			1	2	2	5			
Pontoon				18	18	12	12	12	9	16	37			
Waterski/wake				4	6	2	3	1	5	4	16			
				2		1			3	3				
Paddleboard									4	2	6			
Total	40 full	17		37	37	20	20	24	35	54	113	moderate boat chop	W10	80
3-4:30														
Fishing									1	3	4			
Kayak										3	3			
PWC								3	3	5	11			
Runabout				7	7	7	7	5	17	10	32			
Sail				1	1	1	1	1	4	4	9			
Pontoon				20	20	15	15	18	10	29	57			
Waterski/wake				4	6	2	4	2	4	6	70			
				2		2		2	2					
Paddleboard										4	4			
Total	39 full	13		34	34	27	27	31	41	64	136	moderate boat chop	SW10	80
4:30-6														
Fishing										3	3			
Kayak									1	4	5			
PWC								4	2	7	13			
Runabout				7	7	9	9	6	15	22	43			
Sail				1	1	2	2	2	1	2	5			
Pontoon				10	10	31	31	19	16	34	69			
Waterski/wake				1	2	1	2	1	2	4	66			
				1		1			2	3				
Paddleboard								6		4	10			
Total	40 full	16		20	20	44	44	38	39	83	160	light to moderate	SW9	79

ACCESS ACTIVITY AND LAKE BOAT COUNTS: July 7, 2024 July 4th Weekend
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing								1			1			
Kayak								3		2	5			
PWC								2	1	5	8			
Runabout				2		7		8	9	19	36			
Sail						1		1			1			
Pontoon				4		11		17	13	24	54			
Waterski/ wake				2		2		2	2	1	58			
Paddleboard								2		3	5			
Total	34	18		10	0	23	0	39	28	56	123	low	SW8	77
7:30-9														
Fishing										2	2			
Kayak											0			
PWC								1	2	4	7			
Runabout				2	2	8	8	5	8	8	21			
Sail											0			
Pontoon				2	2	8	8	10	9	9	28			
Waterski/ wake								2	3	1	11			
Canoe Hydrofoil										1	2			
Total	35 7pm 9 9pm	9 7pm 4 9pm		4	4	16	16	19	25	27	71	light action	SW7	73

ACCESS ACTIVITY AND LAKE BOAT COUNTS: July 17, 2024 Non Busy Weekday
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing											0			
Kayak											0			
PWC											0			
Runabout								2	2	3	7			
Sail											0			
Pontoon				1	1						0			
Waterski								1			1			
Other											0			
Total	5	1	6	1	1	0	0	3	2	3	8	Slightly	<5	58
7:30-9														
Fishing								1	1	1	3			
Kayak										2	2			
PWC											0			
Runabout				1	1			4	3	2	9			
Sail											0			
Pontoon				6	3	1	1	1	1	2	4			
Waterski								1		1	2			
Other											0			
Total	6	4	10	7	4	1	1	7	5	8	20	Slight chop	5-10	61
9-10:30														
Fishing								2	1	1	4			
Kayak								1		2	3			
PWC											0			
Runabout						1	1				0			
Sail (10 in class)								2	7	14	23			
Pontoon				1	1	1	1	1	1	2	4			
Waterski								1			1			
Other											0			
Total	13	6	19	1	1	2	2	7	9	19	35	Choppy	10	64
10:30-noon														
Fishing										1	1			
Kayak											0			
PWC											0			
Runabout				1	1			6	7	5	18			
Sail (17 in class)										18	18			
Pontoon				1	1			5	4	1	10			
Waterski											0			
Other											0			
Total	19	8	27	2	2	0	0	11	11	25	47			

ACCESS ACTIVITY AND LAKE BOAT COUNTS: July 17, 2024 Non Busy Weekday
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
noon-1:30														
Fishing								2		1	3			
Kayak									1		1			
PWC								2			2			
Runabout				4	4			3	3	3	9			
Sail (12 in class)									2	13	15			
Pontoon				5	5	4	4	4	5	3	12			
Waterski/tuber										1	1			
Paddleboard										2	2			
Total	18	5	23	9	9	4	4	11	11	23	45	Choppy	10	67
1:30-3														
Fishing						1	1			1	1	big cruiser (CB)/ windsurf (south)/ plane takeoff (north)		
Kayak											0			
PWC									2	2	4			
Runabout				1	1	2	2	3	4	5	12			
Sail				1	1	2	2	1	2	12	15			
Pontoon				4	4	3	3	2	3	3	8			
Waterski/wake									1		1			
Other				1	1				2		2			
Total	20	3	23	7	7	8	8	6	14	23	43	Moderate white caps in south	N12 G20	70
3-4:30														
Fishing									1	2	3			
Kayak								1		2	3			
PWC										2	2			
Runabout				6	6	4	4	5	4	5	14			
Sail				1	1	2	2	1	1	1	3			
Pontoon				6	6	4	4	4	3	8	15			
Waterski/wake				1	1				1		1			
Other											0			
Total	15	3	18	14	14	10	10	11	10	20	41	Moderate	N10 G17	70
4:30-6														
Fishing								1		1	2	Plane landed (south)		
Kayak								4		1	5			
PWC								1	2	2	5			
Runabout				5	5	5	5	3	6	6	15			
Sail				1	1	1	1		2	15	17			
Pontoon				12	12	9	9	3	5	5	13			
Waterski											0			
Paddleboard									1	2	3			
Total	17	4	21	18	18	15	15	12	16	32	60		N7 G10	70

ACCESS ACTIVITY AND LAKE BOAT COUNTS: July 17, 2024 Non Busy Weekday
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing										3	3	Long row boat 16 people (CB)		
Kayak								4		2	6			
PWC											0			
Runabout				4	4	8	8	6	4	13	23			
Sail				1	1			1	8	3	12			
Pontoon				28	28	20	20	13	5	8	26			
Waterski/wake				2	2	2	2				0			
Other								1			1			
Total	21	4	25	35	35	30	30	25	17	29	71		N7	70
7:30-9														
Fishing								1		2	3	Long row boat 16 people (CB)		
Kayak										2	2			
PWC											0			
Runabout				1	1	5	5	5	8	7	20			
Sail						2	2	1	6	5	12			
Pontoon				4	4	24	24	8	9	8	25			
Waterski									1	1	2			
Paddle								3		3	6			
Total	23	3	26	5	5	31	31	18	24	28	70			

ACCESS ACTIVITY AND LAKE BOAT COUNTS: August 10, 2024 Busy Weekend
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing					0				1	2	3	Light building	6-10	51
Kayak					0						0			
PWC					0						0			
Runabout					0			1	2	2	5			
Sail					0						0			
Pontoon				1	1					1	1			
Waterski					0			1			1			
Other					0						0			
Total	6	1	7	1	1	0	0	2	3	5	10			
7:30-9														
Fishing					0			1	1	2	4	Light to moderate White caps on south	NW 8	55
Kayak					0					2	2			
PWC					0						0			
Runabout				2	2			3	4	5	12			
Sail					0						0			
Pontoon				7	7	2	2	1	2	1	4			
Waterski					0			1			1			
Other - canoe					0			1			1			
Total	20	3	23	9	9	2	2	7	7	10	24			
9-10:30														
Fishing								1	1	2	4	Moderate south choppy (wind)	W 10	61
Kayak								1			1			
PWC											0			
Runabout				2	2	2	2	4	6	7	17			
Sail										1	1			
Pontoon				4	4	4	4	2	4	4	10			
Waterski											0			
Other											0			
Total	25	4	29	6	6	6	6	8	11	14	33			
10:30-noon														
Fishing								1			1	Choppy in mid-lake and south	NW 14 0-21	66
Kayak								1		2	3			
PWC										1	1			
Runabout				2	2	1	1	6		9	15			
Sail				2	2				5	3	8			
Pontoon				10	10	6	6	5	6	5	16			
Waterski/ wake				2	4						0			
Other											0			
Total	22	7	29	36	18	7	7	13	11	20	44			

ACCESS ACTIVITY AND LAKE BOAT COUNTS: August 10, 2024 Busy Weekend
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
noon-1:30														
Fishing										1	1			
Kayak				1	1					4	4			
PWC									1	4	5			
Runabout				4	4	3	3	6	10	8	24			
Sail				3	3	3	3			3	3			
Pontoon				10	10	11	11	5	8	9	22			
Waterski/ wake				1	1			1	2	2	5			
Other											0			
Total	22	5	27	19	19	17	17	12	21	31	64	South bay choppy	NW 10 0-20	68
1:30-3														
Fishing								1		1	2			
Kayak											0			
PWC										4	4			
Runabout				4	4	3	3	2	11	7	20			
Sail				3	3	3	3	2	5	1	8			
Pontoon				16	16	11	11	6	9	15	30			
Waterski/ wake				1	1					1	23			
Other									2		2			
Wind surf														
Total	22	4	26	24	24	17	17	11	38	139	188	Middle lake and south white caps choppy- breezy	NW 15 0-23	70
3-4:30														
Fishing								1		1	2			
Kayak											0			
PWC								1	2	4	7			
Runabout				6	6	5	5	6	10	6	22			
Sail				1	1	3	3	2	3	3	8			
Pontoon				11	11	14	14	9	15	22	46			
Waterski/ wake				1	1	2	2			1	3			
Other								1	2	2	6			
Total	27	9	36	19	19	24	24	21	32	41	94	Rough in middle lake	NW 16 0-22	70
4:30-6														
Fishing								1		1	2			
Kayak											0			
PWC										6	6			
Runabout				1	1	5	5	4	5	9	18			
Sail									1		1			
Pontoon				4	4	9	9	8	15	7	30			
Waterski/ wake				1	1			2		2	6			
Other paddleboard										3	3			
Total	30	10	40	6	6	14	14	15	21	30	66	Choppy/ whitecaps in middle south	NW 12 0-18	70

ACCESS ACTIVITY AND LAKE BOAT COUNTS: August 10, 2024 Busy Weekend
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing								1		2	3	Some white caps low to moderate	NW 7 0-12	70
Kayak										2	2			
PWC										5	5			
Runabout				4	4	2	2	5	8	6	19			
Sail									1		1			
Pontoon				6	6	11	11	7	13	15	35			
Waterski/wake						1	1		1	1	2			
Other canoe										1	1			
Total	22	7	29	10	10	14	14	13	24	34	71			
7:30-9														
Fishing								1		1	2	Rare white caps South bay choppy	NW 8	68
Kayak										2	2			
PWC										1	1			
Runabout						3	3	2	4	6	12			
Sail											0			
Pontoon				1	1	14	14	8	10	9	27			
Waterski/wake								1	1		2			
Other canoe								1			1			
Total	11	5	16	1	1	17	17	13	15	19	47			

ACCESS ACTIVITY AND LAKE BOAT COUNTS: August 20, 2024 Non Busy Weekday
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing					0		0				0	mostly calm	4	60 partly cloudy
Kayak					0		0	1			1			
PWC					0		0				0			
Runabout					0		0	2		1	3			
Sail					0		0				0			
Pontoon					0		0		1		1			
Waterski					0		0				0			
Other					0		0				0			
Total	3	1	4	0	0	0	0	3	1	1	5			
7:30-9														
Fishing					0		0				0	Calm	3	62 partly cloudy
Kayak					0		0				0			
PWC					0		0				0			
Runabout				1	1		0	3	3	3	9			
Sail					0		0				0			
Pontoon				1	1		0	1	3		4			
Waterski					0		0		1		1			
Other					0		0				0			
Total	7	1	8	2	2	0	0	4	7	3	14			
9-10:30														
Fishing					0		0				0	Calm	4	64 hazy
Kayak					0		0	1			1			
PWC					0		0				0			
Runabout				1	1		0	2	5	2	9			
Sail					0		0				0			
Pontoon				1	1		0	1	1		2			
Waterski					0		0		1		1			
Other					0		0				0			
Total	9	2	11	2	2	0	0	4	7	2	13			
10:30-noon														
Fishing					0		0	1			1	Calm	4	68 hazy
Kayak					0		0			2	2			
PWC					0		0			1	1			
Runabout					0		0	3	1	4	8			
Sail					0		0				0			
Pontoon				3	3		0	1	1	3	5			
Waterski					0		0				0			
Other					0		0				0			
Total	9	3	12	3	3	0	0	5	2	10	17			

ACCESS ACTIVITY AND LAKE BOAT COUNTS: August 20, 2024 Non Busy Weekday
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
noon-1:30														
Fishing					0		0	1			1			
Kayak					0		0	2			2			
PWC					0		0				0			
Runabout				1	1		0	4	1	1	6			
Sail				1	1		0	1			1			
Pontoon				2	2		0	1	1	4	6			
Waterski					0		0				0			
Other					0		0				0			
Total	9	2	11	4	4	0	0	9	2	5	16	Ripples	2	73
1:30-3														
Fishing					0		0				0			
Kayak					0		0	1		2	3			
PWC					0		0				0			
Runabout				3	3		0	2	2	3	7			
Sail					0		0			1	1			
Pontoon				5	5		0	4	2	5	11			
Waterski					0		0		3		3			
Other					0		0				0			
Total	8	3	11	8	8	0	0	7	7	11	25			
3-4:30														
Fishing					0		0			1	1			
Kayak					0		0	1		1	2			
PWC					0		0		1	1	2			
Runabout				1	1		0	1	3	5	9			
Sail					0		0	1	2	1	4			
Pontoon				6	6		0	3	4	10	17			
Waterski					0		0		1	1	2			
Other					0		0	2			2			
Total	10	4	14	7	7	0	0	8	11	20	39	Ripples, light chop	S6	72
4:30-6														
Fishing					0		0	1		1	2			
Kayak					0		0	3		1	4			
PWC					0		0		1	2	3			
Runabout				4	4		0	4	7	7	18			
Sail				4	4		0	2	2	2	6			
Pontoon				5	5		0	6	6	4	16			
Waterski					0		0		2	1	3			
Other					0		0				0			
Total	12	7	19	13	13	0	0	16	18	18	52		SE5	70

ACCESS ACTIVITY AND LAKE BOAT COUNTS: August 20, 2024 Non Busy Weekday
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing					0		0	1		1	2			
Kayak					0		0	1			1			
PWC					0		0				0			
Runabout				4	4		0	5	5	7	17			
Sail				1	1		0		8		8			
Pontoon				4	4		0	7	3	5	15			
Waterski					0		0				0			
Other					0		0	2			2			
Total	14	5	19	9	9	0	0	16	16	13	45	Light chop	SE6	70
7:30-9														
Fishing					0		0				0			
Kayak					0		0				0			
PWC					0		0				0			
Runabout					0		0				0			
Sail					0		0	1			1			
Pontoon					0		0	4	1	2	7			
Waterski					0		0				0			
Other					0		0				0			
Total	10	4	14	0	0	0	0	5	1	2	8	Light ripples	SE4	68

ACCESS ACTIVITY AND LAKE BOAT COUNTS: August 24, 2024 Non Busy Weekday
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing					0		0	2		1	3			
Kayak					0		0				0			
PWC					0		0				0			
Runabout					0		0	2	4	5	11			
Sail					0		0				0			
Pontoon				1	1	1	1	2	1	1	4			
Waterski					0		0				0			
Other					0		0				0			
Total	6	3	9	1	1	1	1	6	5	7	18	Slight chop. South mostly calm	5	65 partly cloudy
7:30-9														
Fishing					0		0	2		2	4			
Kayak					0		0				0			
PWC					0		0				0			
Runabout				3	3		0	5	5	5	15			
Sail					0		0				0			
Pontoon				11	11	1	1	2	5	1	8			
Waterski					0		0	1	1	1	3			
Other					0		0				0			
Total	15	4	19	14	14	1	1	10	11	9	30	Slight chop, south end chopper	6	66 mostly sunny
9-10:30														
Fishing					0		0	3		2	5			
Kayak					0		0	2			2			
PWC					0		0	1			1			
Runabout				3	3	1	1	10	5	5	20			
Sail					0		0		2		2			
Pontoon				11	11	4	4	4	5	1	10			
Waterski					0		0			1	1			
Other					0		0				0			
Total	23	5	28	14	14	5	5	20	12	9	41	Choppy (south) to calm (west)	7	72 sunny
10:30-noon														
Fishing					0		0	1		2	3			
Kayak					0		0				0			
PWC					0		0	1	3		4			
Runabout				5	5	2	2	8	8		16			
Sail				3	3		0	5	4	15	24			
Pontoon				9	9	5	5	3	7	8	18			
Waterski					0		0				0			
Other					0		0				0			
Total	27	9	36	17	17	7	7	18	22	25	65	Chop some boat chop	5	73 sunny

ACCESS ACTIVITY AND LAKE BOAT COUNTS: August 24, 2024 Non Busy Weekday
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
noon-1:30														
Fishing					0		0	1	1	1	3			
Kayak					0		0	4			4			
PWC					0		0	5		2	7			
Runabout				7	7	4	4	10	5	12	27			
Sail					0		0	2	6	2	10			
Pontoon				20	20	12	12	10	4	15	29			
Waterski					0		0		1	2	3			
Other					0		0	3		3	6			
Total	41	15	56	27	27	16	16	35	17	37	89	Slight chop	5	77 sunny
1:30-3														
Fishing					0		0			1	1			
Kayak					0		0	4		6	10			
PWC					0		0	3	2	3	8			
Runabout				14	14	7	7	9	14	28	51			
Sail					0		0	1	4	1	6			
Pontoon				22	22	11	11	14	9	32	55			
Waterski					0		0	3	2	1	6			
Other					0		0	1		3	4			
Total	39	20	59	36	36	18	18	35	31	75	141	Choppy in south, mid lake boat chop	SE10	82
3-4:30														
Fishing					0		0	2		1	3			
Kayak					0		0	5			5			
PWC					0		0	1	2	5	8			
Runabout				9	9	10	10		8	19	27			
Sail					0		0		7	111	118			
Pontoon				17	17	22	22	17	7	29	53			
Waterski					0	1	1	1	1	4	6			
Other					0		0	2	1	3	6			
Total	41	21	62	26	26	33	33	28	26	172	226	Moderate waves in middle. Boat chop significant.	SE9	82
4:30-6														
Fishing					0		0	1		1	2			
Kayak					0		0	2	1	5	8			
PWC					0		0		4		4			
Runabout				21	21	23	23		10	29	39			
Sail					0	1	1	2	1		3			
Pontoon				27	27	61	61	14	14	37	65			
Waterski				3	3	2	2	2	3	2	7			
Other					0		0	1		3	4			
Total	41	21	62	51	51	87	87	22	33	77	132		SE8 gust 12	81

ACCESS ACTIVITY AND LAKE BOAT COUNTS: August 24, 2024 Non Busy Weekday
RC=Ramsey County, MP=Matoska Park, and CB=Commercial Bay.

	Trailers At Start			Out to Lake		In From Lake		Lake Boat Counts				Waves	Wind	Temp
	RC	MP	Total	CB	Total	CB	Total	W	S	N	Total			
6-7:30														
Fishing					0		0			2	2			
Kayak					0		0	1		3	4			
PWC					0		0		2	4	6			
Runabout				5	5	18	18	2	11	27	40			
Sail					0		0	1	2	12	15			
Pontoon				8	8	27	27	13	7	19	39			
Waterski					0	2	2	1	2		3			
Other					0		0	2		111	113			
Total	39	18	27	13	13	47	47	20	24	178	222	Slight boat chop	SE6	81
7:30-9														
Fishing					0		0	1		1	2			
Kayak					0		0	3			3			
PWC					0		0	1		2	3			
Runabout				4	4	6	6	5		11	16			
Sail					0		0		2	1	3			
Pontoon				1	1	12	12	4	18	4	26			
Waterski					0		0			2	2			
Other					0		0	1		2	3			
Total	10	5	15	5	5	18	18	15	20	23	58			

APPENDIX B: Questionnaires



White Bear Lake Conservation District Presents the 2024 Lake Resident Survey Questionnaire

The White Bear Lake Conservation District is updating a lake resident lake user survey. A similar survey was conducted in 2005. You may respond on this paper version and return in the postage-paid envelope or online (QR Code to the right). Results will be published on the WBLCD website. Thank you.



1. How many years have you: lived or leased a slip on White Bear Lake?
Years living on the lake _____
Years leasing a slip _____

2. What types of watercraft do you typically utilize on White Bear Lake?
 - Canoe
 - Kayak
 - Paddleboard
 - Sailboard, Kite Board, Hydrofoil
 - Runabout
 - Ski boat
 - Towboat (wake, surf)
 - Fishing boat
 - Sailing boat
 - PWC (Personal Watercraft / Jetski)
 - Pontoon

3. What is your typical pattern of usage on White Bear Lake?
Times per week (in the summer) _____
Preferred times of day _____

4. Are there specific circumstances or conditions when you tend to avoid using White Bear Lake?
 - Holidays
 - Weekends
 - Inclement weather
 - Nighttime
 - Other _____

5. What are your primary activities on White Bear Lake?

- Water skiing, wake boarding or wake surfing
- Swimming
- Fishing
- Pleasure boating
- Sailing
- Other _____

6. Do you have any concerns regarding how others use White Bear Lake?

7. Are you familiar with the lake ordinances?

_____ Yes _____ No

If yes, do you find the lake ordinances to be:

- Overly restrictive
- Appropriately balanced
- Not restrictive enough

8. What is your perception of enforcement efforts on White Bear Lake?

- Insufficient
- Adequate
- Excessive

9. Do you find the lake to be crowded at certain times? If yes, do you notice any particular types of watercraft causing congestion or disturbance?

_____ Yes _____ No

10. Have you ever felt unsafe while on White Bear Lake? If yes, please list details.

_____ Yes _____ No

11. Are there any aspects of the lake's condition that worry you in relation to your use of the lake?

12. Have you observed any water quality issues or shoreline erosion problems on White Bear Lake? If yes, please elaborate.

_____ Yes _____ No

13. Do you have any concerns regarding the safety or impact of winter activities on the frozen lake surface? If so, please explain.

_____ Yes _____ No

14. How likely are you to recommend spending time on WBL to a close friend or colleague?
(1 = Not Likely, 10 = Very Likely) _____

15. Any other comments?



White Bear Lake Conservation District

Boater Exit Survey

1. How many hours did you spend on White Bear Lake today?
2. How frequently do you visit White Bear Lake each year?
3. What is the approximate distance between your residence and White Bear Lake?
4. Where did you park your vehicle during your visit to White Bear Lake?
5. What was the primary activity you engaged in during your time on White Bear Lake?
6. What factors influenced your decision to choose White Bear Lake as your destination?
 proximity
 fishing opportunities
 water quality
 size suitable for sailing
 available facilities
 other: _____
7. Did you observe the water patrol boat during your visit today?
8. In your opinion, is White Bear Lake adequately marked to indicate obstacles and shallow areas?
9. Is the boat you used today:
 rented
 borrowed
 owned by you?
10. How likely are you to recommend spending time on WBL to a close friend or colleague? (1 = Not Likely, 10 = Very Likely) _____

APPENDIX C: MnDNR BOAT CATEGORIES

Section 2: Watercraft Types and Other Accessories

There are many boat types you will encounter in the field, but the survey you will use only has a limited number of options. This section will teach you about the most common types of watercraft you will encounter.



Runabout

Used for water sports, cruising and fishing. Runabouts are powerboats that are typically powered by a sterndrive (inboard-outboard) motor. Runabouts do not have ballast tanks.



Wakesport Boat

These watercraft are equipped with ballast tanks and typically have an inboard motor. They usually have a tower that attaches to both sides of the vessel and has attached storage racks for wakeboards, or water skis. These watercraft contain at least one hard or soft tank located underneath the deck which hold large amounts of water in order to make the watercraft heavier as it moves through the water, which generates larger wakes. Wakesport boats have a series of thru-hull fittings along the hull that discharge ballast water.



Fishing Boat

They will have live wells or baitwells inside. They are “V” hulled and usually have an outboard motor. Brand examples include: Lund, Crestliner, Ranger, Stratos, Alumacraft, Nitro, Skeeter, Tuffy, Smoker Craft, Yar-Craft, Triton, Tracker.



Jon Boat

Will have a flat bottom. Often times they are a drab color, like olive green. Jon boats are simple boats that typically have few internal compartments, if any.

SAFETY MESSAGE:

When approaching watercraft be aware of where they are parked, and if they're properly trailered. Be sure the watercraft and trailer are not in danger of tipping.





Personal Watercraft (PWC)

Built for one, two or three people and are 9 to 14 ft long. They have a jet propulsion system.



Pontoon

Typically a flat decked vessel that floats and balances by means of two or three large, closed cylinders that are mounted lengthwise.

Note: plugs should not be removed from the cylinders.



Boat Lift or Similar

A tube-framed device that sits next to a dock and is used to raise or lower a boat into or out of the water.



Canoe

A canoe is a long narrow boat that is moved by paddles with a single blade.



Cabin Cruiser

A cabin cruiser is a type of watercraft that provides accommodation for people inside the structure. These watercraft are complex and may contain tanks for potable (not lake) water, toilets (heads), and air conditioning systems.

Photo credit: Skipp LaJoy



Kayak or Similar

A kayak is a narrow boat occupied by one, two or three people that is moved by paddles with two blades.



Sailboat

Watercraft likely to have a keel or keel box, mast, sail, more rounded hull, rudder, and possibly ballast tanks.



LSP Transport Barge or Pontoon

Lake Service Providers will use a flat-topped boat to transport docks and lifts across the lake. They are usually a modified pontoon with the seating and safety rails removed. They will have a steering column and captain's seat with little else. These may have a crane attached or other equipment on board to lift the equipment onto the boat.

APPENDIX D: WBLCD Ordinances (Table of Contents)



WHITE BEAR LAKE CONSERVATION DISTRICT (WBLCD)

ORDINANCES CURRENT AS OF 1/23/2025

Document history

- 11/5/2018 – Update to create this formatted copy—no material changes to Ordinances.
- 6/13/2019 – Update to correctly reflect 2017 update to Ordinance #16 (addition of section 2.01 subdivision 20).
- 1/21/2020 – Update to amend Ordinance 5 section 3.01. subdivision 1.a.; Ordinance 5 section 3.01. subdivision 1.b.; Ordinance 5 section 5.01. subdivision 1.a.; and the repeal of Ordinance 12.
- 1/18/2022 – Winter safety update to Ordinance 5 section 3.01 subd. 1 as per order 2021-03, and excess slips penalty update to Ordinance 5 section 4.01 subdivision 2.L as per order 2021-01.
- 3/15/2022 – Update to incorporate use of ordinary high water level to Ordinance 5 section 2.0.1 subdivision 18 as per order 2022-01, Ordinance 5 Section 2.0.1 subdivision 11 as per order 2022-02, and Ordinance 5 section 3.0.1 subdivision 1b as per order 2022-03.
- 1/20/2025 – Update to revise Ordinance 6, adding a preamble and changing section 1 to remove reference to specific lake level and section 3 to adjust penalties, as per order 2025-01.

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ORDINANCE #5 - AN ORDINANCE REPLACING ORDINANCE NO. 3; RELATING TO THE CONSTRUCTION, INSTALLATION, MAINTENANCE AND LICENSING OF DOCKS, BOAT MOORING AREAS AND OTHER FIXED OR FLOATING STRUCTURES ON WHITE BEAR LAKE 3

ORDINANCE #6 - AN ORDINANCE REGULATING THE APPROPRIATION AND USE OF WATER FROM WHITE BEAR LAKE 14

ORDINANCE #7 - AN ORDINANCE REGULATING COMMERCIAL SALES FROM WATERCRAFT ON WHITE BEAR LAKE; REQUIRING A LICENSE; ESTABLISHING LICENSING PROCEDURE AND REQUIREMENTS 15

ORDINANCE #9 - AN ORDINANCE REGULATING OPERATION AND RENTAL OF PERSONAL WATERCRAFT ON WHITE BEAR LAKE 20

ORDINANCE #12 - AN ORDINANCE AMENDING ORDINANCE NO. 5: RELATING TO BUOYS AND ACCESS TO NAVIGABLE WATERS, DOCKS AND STRUCTURES. 25

ORDINANCE #13 - AN ORDINANCE AMENDING EXISTING ORDINANCE NUMBER 7 OF THE WHITE BEAR LAKE CONSERVATION DISTRICT BY ADDING LANGUAGE TO AND CLARIFYING THE MEANING OF THE DEFINITIONS OF "WATERCRAFT" AND "COMMERCIAL SALES ACTIVITY." 26

ORDINANCE #14 - AN ORDINANCE PROHIBITING POLLUTION OF WHITE BEAR LAKE AS PART OF A COMPREHENSIVE PROGRAM TO ELIMINATE POLLUTION. 27

ORDINANCE #15 - AN ORDINANCE RELATING TO ADMINISTRATIVE CITATIONS AND CIVIL PENALTIES FOR VIOLATION OF DISTRICT ORDINANCES. 32

ORDINANCE #16 - AN ORDINANCE RELATING TO THE USE OF WHITE BEAR LAKE INCLUDING REGULATIONS CONCERNING THE TYPES OF WATERCRAFT PERMITTED ON THE LAKE, THEIR EQUIPMENT, THE MANNER OF THEIR OPERATION, THEIR RENTAL, SCUBA DIVING, AND OTHER MATTERS 39

ORDINANCE #17 - AN ORDINANCE RELATING TO THE PLACEMENT AND ENFORCEMENT OF NAVIGATIONAL MARKINGS ON WHITE BEAR LAKE 49

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APPENDIX E: RELATED LAKE USE PUBLICATIONS



2020 Minnesota Recreational Boating Study

6/23/2021

GLM 20204

Summary of Key Statistics

Research Objectives

- This research was conducted to learn the behaviors and attitudes of Minnesota recreational boaters who have licensed a motorized or non-motorized boat with the DNR. The sample of 2,893 recreational boaters has been weighted to be proportional to the profile of recreational boaters who have licensed boats. Therefore, these data can be used to understand and profile the population of those who have licensed boats.
- It is important to keep in mind that the person who licensed the boat may not be the one using the boat. The data reflect the behaviors and sentiments of the person who licensed the boat(s), not all persons who use watercraft on Minnesota lakes and rivers.

Boater Profile

- Individuals who licensed boats skew older, more educated, and more affluent (based on household income) than the population of Minnesota.
- About half (49%) of the respondents own waterfront property. Of those who own waterfront properties, about half own seasonal homes.
- Three-fourths (75%) say boating is an important part of their life.
 - Most (89%) of the recreational boaters say they go boating for rest and relaxation. However, about half (48%) say they go boating to catch/ harvest fish.
- Most recreational boaters (59%) have more than one watercraft. About one-third own three or more boats.
 - Mid-size motorized boats (seventeen to nineteen feet) (35%) and smaller motorized boats (less than seventeen feet) (34%) are more commonly owned. Larger motorized boats (twenty feet or more) (21%) are less popular.

Boating Activities

- The most common activities among boater owners are boat riding (77%), fishing (76%), and swimming off of the boat (47%).
- Just over one-quarter (28%) paddle and 32% water ski or tube. Fewer (5%) wake-surf.
- Of those who fish, about 75% fish at least some of the time they go boating.
- Half (50%) of the recreational boaters used non-motorized boats last season.
- Sixty percent (60%) of non-motorized recreational boaters use non-motorized boats entirely on lakes and 4% use them entirely on rivers. The remainder (36%) use non-motorized watercraft on a mix of lakes and rivers.

The Boating Experience

- Most recreational boaters engage in boating for rest and relaxation (89%), social times (62%), or fishing/ harvesting (48%).
- Recreational boaters are generally satisfied with the Minnesota boating system.
 - 87% are satisfied with the overall water recreation system.
 - 70% or more are satisfied with the enforcement of boating regulations, boating safety education, and information about boating opportunities, rules, and maps.
- High wakes (34%), boats going too fast or too close to shore (30%), jet skis (27%), and wake-surfing (24%), are the most common problems.
 - Greater Minnesota recreational boaters, Metro area recreational boaters, and lakeshore property owners perceive problems as more serious. The Greater Minnesota area feels that

recreational boaters making high wakes (28%), going too fast (27%), jet skis (25%), and careless operation (25%) are the biggest issues. About half (43%) of the recreational boaters in the Metro area feel high wakes from other recreational boaters is the biggest problem followed by careless operation of boats (38%), boats going too fast (36%), and wake-surfing boats (33%).

- Lakeshore property owners feel high wakes (39%), boats going too fast (35%), careless operation (32%), wake-surfing (29%), and jet skis (29%) are the biggest problem areas.
- About 80% perceive crowding to be an issue 25% or less of the time.

Public Water Access Facilities

- About 79% of recreational boaters use public launches and about two-thirds of those users use public launches more than three times a year.
- Respondents say that docks (79%), toilets (54%), and a large parking lot (52%) are most important amenities to have at public boat launch facilities.
- Of those who have used a public boat launch, 88% are satisfied with the availability of public launches and 79% are satisfied with the quality of public launches.
 - Recreational boaters who are willing to pay more in registration fees are most likely to support maintaining existing boating facilities rather than additions or improvements.

Boating Safety and Enforcement

- Nearly all (90%) recreational boaters have life jackets on their boats.
- A minimal difference exists between the two regions for wearing life jackets. About 60% in each region wear life jackets 25% or less of the time when boating.
- At least 42% of the respondents are willing to support restricting wake-surfing in shallow water, on small lakes, and near shore.
- Almost all respondents say some wakeboard boat restrictions are needed (about 94%). Additionally, those with waterfront homes are more likely to support wakeboard boat restrictions further away from shore.
 - Among those who want restrictions or have an opinion about wake-surfing restrictions, about two-to-one prefer restrictions are on a lake-by-lake basis rather than on a statewide basis.
 - Waterfront homeowners are more likely to support wake-surfing restrictions (i.e., wake-surfing near shores and wake-surfing in shallow water). However, the majority of all respondents support restricting wake-surfing near shore.
- Respondents are more likely to oppose than support expanding the time jet skis are allowed on the water.
 - More than half (54%) of waterfront homeowners oppose expanding the hours to operate a personal watercraft. However, even 44% of those who do not own waterfront property oppose expanding the hours to operate a personal watercraft.

Section 2: Boating Experience and Satisfaction

Even though nearly half of the respondents believe there were more boats on the water during the 2020 season, too many boats (crowding) does not appear to be an issue. Past DNR boating studies have shown that Twin Cities' area lakes are used 3 to 10 times more intensely than lakes in other parts of the state. These studies also found that Twin Cities' area recreational boaters perceived crowding and congestion at higher rates.

How does the number of boats you have seen on the water this year compare to past years?

Number of boats on the water this past year compared to past years	Total (weighted)
Sample Size	2,893
Total (weighted)	591,546
More	48%
Substantially more	23%
Slightly more	26%
About the same	32%
Fewer	13%
Slightly fewer	9%
Substantially fewer	4%
Not sure	6%

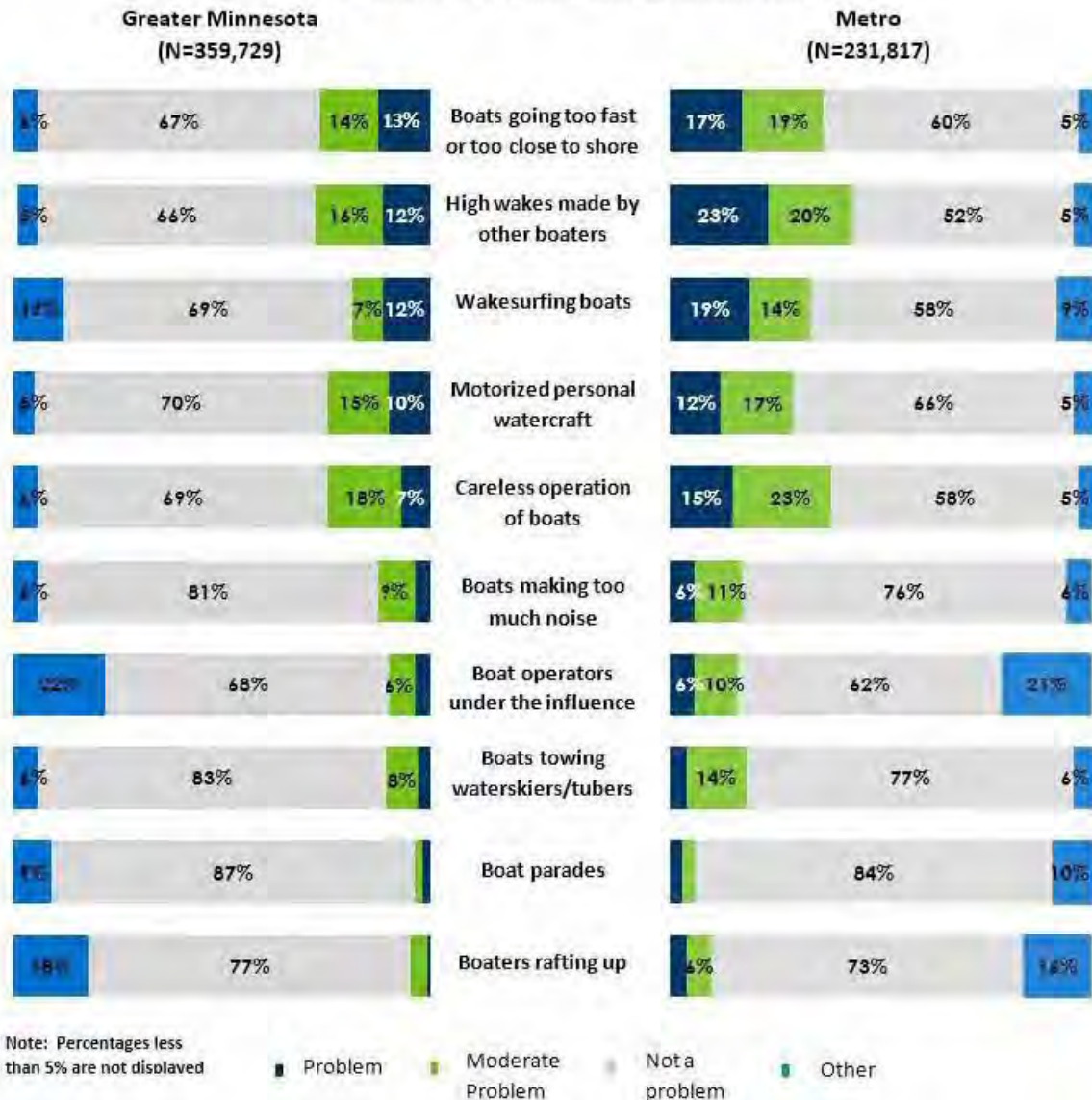
About a third of boaters did not experience crowding/ too many boats last season. About 15% did experience crowding about half of the time or more often while they were boating this past season.

About what percentage of the time was there crowding/ too many boats while you were boating this past season (2020)? [Aided]

Percentage of time there was overcrowding/ too many boats	Total (weighted)
Sample Size	2,893
Total (weighted)	591,546
0%	31%
10%	29%
25%	19%
50%	11%
75%	3%
100%	1%
Not sure	6%

Recreational boaters in Greater Minnesota feel the biggest problems are high wakes (28%), boats going too fast (27%), personal watercraft (25%), and careless operation of boats (25%). About half (43%) of the recreational boaters in the Metro area feel high wakes from other recreational boaters is the biggest problem followed by careless operation of boats (38%), boats going too fast (36%), and wake-surfing boats (33%).

Based on your boating experience this past season (2020), how much of a problem is the following on lakes and rivers in MN?



FAQs: Boat-generated wake wave study

- **What was the study?**

This research project focused on measuring the maximum height, total energy, and maximum power of the waves (defined as wake waves) produced by four recreational boats common to Minnesota lakes. The researchers also measured how the wake waves changed as they moved away from the boat and towards shore. Two of the boats were modern wakesurfing boats and two were typical non-wakesurf boats that have been operating on Minnesota waters for decades. The study highlights the differences in the wake wave characteristics of these four boats.

- **Where and when was the study conducted?**

This field study took place on Lake Independence in Maple Plain, Minnesota between September-October 2020.

- **What boats were part of the study?**

Two of the boats were recreational boats commonly operated on Minnesota waters for a range of activities including cruising, tubing, waterskiing, and wakeboarding. These two boats were a 21-foot Larson LXI 210 and 20-foot Malibu Response LX.

Two 2019 wakesurf boats were also part of the study. These boats were a 21-foot Malibu VLX Wakesetter and 25-foot Malibu MXZ Wakesetter. The wakesurf boats are specifically designed to produce a large wave directly behind the boat for the sport of wakesurfing.

- **How was the study conducted?**

Details of the study can be found in the Executive Summary and in the full report (links below). In summary, five wave height sensors were installed at the test shoreline of Lake Independence and these remained in place over the duration of study. Over the course of the field campaign, wave data were collected on each of the four different boats - one boat took a single day to evaluate.

Boats were driven at four different distances from shoreline (225 ft, 325 ft, 425 ft and 625 ft) and under three different operating conditions.

Wave height data were collected for each boat and then post-processed after the field campaign. Analysis of the data involved calculation of maximum wave height, total wave energy, and maximum wave power produced by each boat and each condition.

- **Who conducted this study?**

This study was conducted by a small team of professional research staff. The team included:

- Jeff Marr, Associate Director of Engineering and Facilities at the St. Anthony Falls Laboratory (SAFL), Project Lead
- Andrew Riesgraf, SAFL Researcher
- Matt Lueker, SAFL Associate Engineer
- William Herb, SAFL Research Associate
- Jess Kozarek, SAFL Research Associate & Outdoor StreamLab Manager
- Kimberly Hill, Associate Professor of Civil, Environmental & Geo- Engineering

- **What did the study find?**

Major findings include the following:

- All boats produced their smallest wake waves when they were operated under the highest speed test condition (20 mph) and were planing on the water surface. Planing, a condition familiar to boaters, is when the boat rides on top of the water and is the mode of operation for waterskiing, cruising or other types of high speed activities.
- All boats generated their largest wake waves when operating at the slower speed test condition (~10 mph). This was a condition where the trim (i.e., angle of the boat to the water surface) of the boat was high, and the boat's hull was displacing a large amount of water. Wakesurf boats are designed to operate around this condition during wakesurfing. For non-wakesurf boats, this is a condition that boats typically transition through quickly as they accelerate or decelerate.
- The study compared the wake wave characteristic of the boats under each of their "typical operating conditions." This was planing speed for the two non-wakesurf boats, and plowing speed for the wakesurf boats. **When comparing the boats under typical operating conditions at a distance of 100 ft from the boat, the wakesurf boats produced maximum wave heights that were ~2-3 time larger, total wave energies that were ~6-9 times larger, and maximum wave powers that were ~6 to 12 times larger than the non-wakesurf boats.**
- The study considered one example of an aftermarket wake shaper - a paddle-type device attached to the outside hull of a non-wakesurf boat, which helps create wake waves suitable for wakesurfing. The results suggest that this aftermarket device was successful in increasing the wake wave characteristics, indicating that "modified" non-wakesurf boats are capable of producing large and energetic waves.

- The data collected can be used to evaluate equivalent operational distance for different types of boats or operating conditions. Our report demonstrates two examples, where a 200 foot operational distance for non-wakesurf boats is selected as the reference condition (i.e., the distance from shoreline/other structures currently recommended by the Minnesota DNR). In the first example, the wake wave characteristics of a planing non-wakesurf boat (20 mph) were used as reference. **The data suggest that operational distances greater than 500 feet are required for the wake waves generated by a wakesurf boat to attenuate to similar wake wave characteristics as the non-wakesurf boat reference.** In the second example, the reference condition was a non-wakesurf boat at slower plowing speeds (~10 mph). **Here, the data suggest that operational distances greater than 425 feet are required by the wakesurf boats.**

- **What do those findings mean more broadly?**

This study is focused on producing robust data on the characteristics of wake waves generated by recreational boats found on lakes. The data, and our example method of comparing non-wakesurf boat and wakesurf boat operational distances, can be used to help inform recommendations, policy or legislation. However, establishing recommendations, policy, or legislation is not the role of our research team.

The report indicates the following outcomes:

1. Wake waves produced by wakesurf boats during wakesurfing are measurably larger than non-wakesurf boats in terms of maximum wave height, total wave energy and maximum power.
2. How a boat is used, or its “typical operation,” is an important consideration. Non-wakesurf boats can generate large waves when they plow water during acceleration to or deceleration from planing, but these boats generally spend little time in this condition. Wakesurf boats used for wakesurfing generally spend a majority of time in this condition. Non-wakesurf boats can be outfitted with aftermarket devices, like a wake shaper, to create wake waves suitable for wakesurfing.
3. Data like those produced in this report can be used to inform guidance on operational distance. For example, this study infers, depending on which non-wakesurf boat reference condition is selected, that at 200 feet of operational distance, the wakesurf boats would need to operate at distances greater than 500 feet or 425 feet from shore/structure/object, etc.
4. This study was limited to four boats and the testing period was relatively short. The study’s data and findings are important additions to the growing body of research in the area of wake waves; however, more studies of this type, as well as studies focusing on

how waves and propeller wash interact with lake bottoms, shorelines and structures, are needed.

- **Did this study examine shoreline erosion or failure of shoreline protection resulting from large boat waves?**

No. The study did not investigate these topics; rather, it focused on characterizing the wake waves themselves. The results of this study will support further research focusing on environmental impacts like shorelines.

- **Are there plans to continue research, and what will be studied?**

St. Anthony Falls Laboratory intends to continue conducting research on boat-generated wake wave impacts. The next phases of research will focus on the following questions:

- What are the characteristics of propeller wash, (i.e., the high velocity water jet produced by the boat propeller), and how does it vary with the type of boat and mode of operation of the boat? At what depth range does propeller wash begin to interact with the lake bottom?
- How do large wake waves interact with the lake environment, including the lake bottom, shorelines (natural and riprap), structures in the water like docks and lifts, vegetation, and fish habitat?

- **How was this project funded?**

This study was funded entirely through a crowdfunding campaign conducted by the University of Minnesota Foundation, with over 200 donors contributing. Donations were received from across the country, with a majority from within Minnesota and other Upper Midwest states.

- **Were donors or other outside groups involved in the research design, analyses or final report?**

No. Donors had no input in the design or scope of this research project. Analysis and report development involved only the University of Minnesota - St. Anthony Falls Laboratory research team. The only exceptions to this were the third party review facilitator and the report's two external reviewers.

- **Is the crowdfunding campaign still accepting donations and how can I contribute?**

The original crowdfunding campaign has ended but individuals or organizations can still contribute directly to the SAFL Healthy Waters Initiative through the St. Anthony Falls Laboratory website. Donation will go directly to the research program and the next phases of the project. [Donate to SAFL's Healthy Waters Initiative.](#)

- **Where can I get more information?**

Please follow the links below for additional information:

- Full report: [“A Field Study of Maximum Wave Height, Total Wave Energy, and Maximum Wave Power Produced by Four Recreational Boats on a Freshwater Lake”](#)
- News release: [“University of Minnesota researchers study waves created by recreational boats”](#)

- **Who can I contact about this report?**

Please send all media requests to **Savannah Erdman**, University Public Relations, at erdma158@umn.edu, or to the University Relations' main news line at unews@umn.edu.