

## **WAKE SURFING AND FISH HABITAT LOSS ON MID LAKE**

The following information represents my research regarding the loss of lake weeds, and as a direct result, loss of fish habitat on Mid Lake in the town of Woodruff, WI. After thoroughly researching the causes of weed loss and fish habitat, my personal opinion is that the information I obtained logically describes the detrimental effect that wake surfing is having on our shallow basin lake as well as similar shallow lakes and bays.



Presented by John Johnston

Mid Lake is a 221 (9,626,798 SF) acre lake located in Oneida county. The mean depth of Mid Lake is 6 ft. and its Maximum depth is 12ft with a shoreline of 2.6 miles. In the past, Mid Lake had very thick weed cover that encompassed the entire lake. The Mid Lake Protection and Management District owns a weed harvester and has a permit from the DNR to cut weeds in specific corridors. Historically, this cutting would yield hundreds of loads of weeds per season. Beginning in 2014, the number of loads per season has dramatically decreased with only 10 loads being harvested in 2019 and 9.75 in 2020. This information is detailed in the Mid Lake Wisconsin weed harvest log below (pic 1).

Mid Lake Wisconsin Weed Harvest Log				
	1st Harvest Date	Last Day of Harvest	# of Loads Harvested	General Notes From Harvesting Crew
2009	6/2/2009	9/4/2009	252	CLP EARLY CUTTING - GPS USED - VERY HELPFUL
2010	5/17/2010	8/30/2010	237	EARLY CUT OF CLP - HARVEST CONTINUED TILL 06/06/10 THEN PAUSED FOR AWHILE
2011	6/6/2011	9/7/2011	282	EARLY CUT OF CLP - 82 LOADS OF CLP BY 7/11/11
2012	6/20/2012	8/31/2012*	300	N/A
2013	7/8/2013	8/31/2013*	239	N/A
2014	7/10/2014	8/31/2014*	95	ROAD WORK CUT HARVST SEASON SHORT, SOME LOADS WERE ONLY PARTIAL - OBSERVED LESS THAN NORMAL WEED GROWTH
2015	6/24/2015	9/17/2015	56.75	OBSERVATION - LESS THAN NORMAL WEED GROWTH
2016	6/16/2016	9/2/2016	20.3	3 DATES ON DAILY REPORT LOADS HARVESTED WERE NOT RECORDED ON OPERATORS REPORT
2017	7/1/2017*	8/29/2017	48	N/A
2018	7/1/2018*	8/31/2018*	N/A	REPORT NOT SUBMITTED
2019	6/22/2019	9/7/2019	10	LEAST AMOUNT OF WEEDS HARVESTED EVER!
2020	7/1/2020*	8/31/2020*	9.75	LEAST AMOUNT OF WEEDS HARVESTED EVER!

(pic 1)

My first thought as a water skier and land owner on the often downwind side of the lake is that this is great news! No more raking and piling weeds and you can swim and ski anywhere without landing in a tangle of weeds.

However, the fisherman in me knows that this is bad news. Mid Lake is a hatchery for many species of pan fish and game fish. Walleye, bass, crappie, northern, muskie and other assorted pan fish favor Mid Lake for spawning in the spring because it is shallow, warms quickly, and in the past had abundant weed cover to protect newly hatched fry from predators. Without weed cover, the number of fish reaching maturity is greatly reduced. This in turn affects the entire Minocqua chain as these yearlings spread through the thoroughfare to other lakes in the chain after they have grown in the Mid Lake nursery. I have fished the chain and Mid Lake for over 30 years and I can tell you unequivocally that the loss of weeds has dramatically reduced the northern, walleye, bass and pan fish population in the lake.

## So what's the cause?

I would suggest a major contributor to weed loss is wake surfing (not to be confused with wakeboarding). While I have nothing against this relatively new sport, I have tried it and enjoy it; its effect on a shallow lake such as ours is obviously destructive to lake weeds. Note that most all major wake surfing boat manufacturers stress that to generate the best wave, these boats need to be in **at least 10 to 12ft of water (Ironically this should eliminate Mid Lake from a captain's destination).**

**Wakeboarding** has been around for over 30 years, it can be done behind any boat but best behind a wakeboarding boat. When you wakeboard you are using a 65 foot rope with a handle much like water skiing. The boat travels at approximately 18mph (**on plane**) and generates a medium size wake. The wake size can be controlled and shaped through the use of tabs and ballast tanks in the stern of the boat. The wakeboarder slaloms back and forth using the wake as a ramp to jump and do tricks. The boat is almost fully on plane so the prop angle and depth is not a great deal more than a ski or fishing boat. The key difference here is that the boat is **on plane**.

**Wake surfing** is relatively new and has grown exponentially in the last 5 years. Coincidentally or not (I would suggest not) **this coincides with the decline of weeds in Mid Lake and many other shallow basin lakes and bays.** Wake surfing unlike wakeboarding or skiing is done directly behind the boat – 5 to 15 feet distance. The surfer uses a rope to get up and then promptly drops it and free surfs in the wave directly off the transom (pic 2 and 3).



(Pic 2)

### Water sport boat comparison at operating speed...



(pic 3)

When wake surfing these boats only travel at 10mph and are **not on plane**, the term for this is **PLOWING**. The object is for the boat to make the wake/wave as big as possible. This can be done behind a wakeboarding boat, but in recent years manufacturers have been targeting this sport. They are now making specialized boats that are larger and capable of dragging their stern to make monster waves. The larger wake surfing boats (can be seen on our lake) weigh around 6000 lbs. and can rapidly load another 4000 to 5000 lbs. of water ballast in the stern. They can generate waves over 4ft high. The angle of the hull at optimum speed is around 20 to 25 degrees. The prop shaft is at another 15 degrees, so overall prop angle is around 35 to 40 degrees. These boats draft 24 to 36 inches standing still. While under power, they are pushing the stern down another foot or so. This means the prop can be up to 48" below the surface of the water. **This puts that prop only a couple of feet off the bottom of Most of Mid Lake (pic 4)!!**



(pic 4).

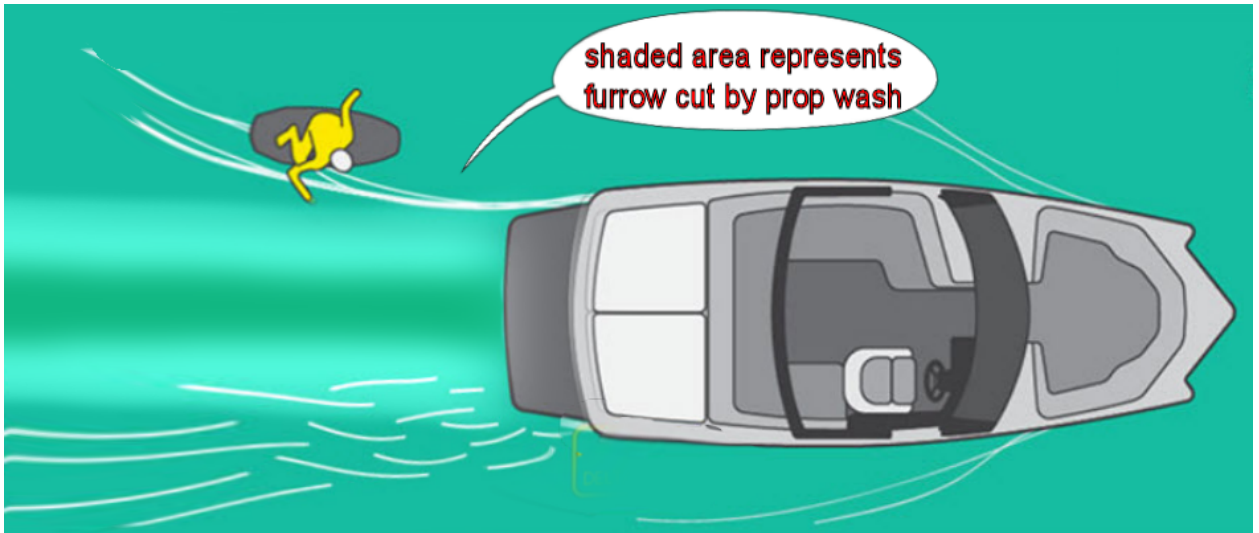
When you take all of this into account, you have a 350 to 500 hp machine with a cutting blade (prop) only 2 to 3 feet off the bottom. This shreds the weeds and simultaneously blasts the bottom of the lake undermining the plant roots and releasing sediment into the lake. These sediments contain high amounts of Phosphorous and other contaminants such as mercury. On a calm clear day you can actually see the plume of silt trailing behind these boats when plowing across Mid Lake.

On Mid Lake, due to water clarity and the fact that we have a mostly silt and mud bottom, it isn't possible to see the furrows cut in the bottom of the lake by these boats. If you go to neighboring Lake Tomahawk, where the bottom is mostly sand and the water is clear you can see the furrows. The picture below (pic 5) was taken on 09/26/20 at an area known as "The Boot Jack" (aka: "Table Top" - N45° 49.481; W089°38.596'). This area is 5 to 8 feet deep and has many furrows cut by surf boats. The picture shows one such plow furrow. You can clearly see the center is cut deep (darker due to sediment settling in the deeper area) by the prop thrust and the wash out tills to both sides of the cut clearing about a 6 foot wide track! (pic 5 and 6)

In this case, the bottom of sand and rock is already void of weed cover so the damage is negligible. The turning over of the sand gives it a lighter color until algae darkens it again. These can actually be seen in satellite images (Attachment 1).



(pic 5)



(PIC 6)

## **Sobering fact**

If you take the area of Mid Lake where wake surfing is allowed (200 ft off shore) and you divide it by the amount of area one of these boats can cover in 1 hour at 10mph X 6FT wide, a boat traveling in a planned route could turn over the bottom of the entire lake in just 22 hours. That means 5 boats can do it in just over 4 hours! (see attachment 2)

With the constant agitation of the bottom in the summer months, the weeds have little chance of recovery.

## **Resolution / Solution?**

I personally feel that everyone has a right to share and enjoy our lakes and hesitate to try to take away the way that some people choose to enjoy it. Yet, at the same time we need to find a way to protect it and make sure that one type of activity doesn't destroy the eco system of Mid Lake. We, as residence of Mid Lake are fortunate to have access to a chain of lakes. The three largest lakes on our chain have large open areas of deep water only a short scenic boat ride away.

Many lakes across Wisconsin and the country are proposing or implementing bans on wake boats. The town of Bass Lake Wisconsin has implemented one such ordinance, (attachment 3) several others such as Presque Isle are in the process of implementing restrictions as well. Simply searching the web for "wake surfing boat bans" will bring up a plethora of information on communities considering or trying to ban these boats. Ironically, they want to ban them because the large waves they generate are damaging shorelines, docks and moored boats, a topic I have not addressed as well as in depth research on the release of trapped contaminants into the lake. Some have also mentioned the same destruction I am outlining here.

While banning wake surfing on Mid Lake would certainly solve the problem, it would be very difficult to enforce. Outside of a ban it may be helpful to inform residents and transient wake surfers that their boats can damage more than just shoreline. Currently there are signs posted at the landings on our chain similar to the one below (pic 7).

## WAKE RESPONSIBLY

- 1 Stay at least 200 feet away**  
from the shoreline, docks, or other structures.
- 2 Keep music at reasonable levels.**  
Sound travels well over water. If it's loud enough to hear at 80 feet back, it is likely loud enough for homeowners to hear, too.
- 3 Minimize repetitive passes**  
on any one portion of shoreline. Once you've run the same line for a while, move on to another area.

REMEMBER, YOU ARE RESPONSIBLE FOR YOUR OWN WAKE.



(PIC 7)

These rules are provided by the WSIA (Water Sports Industry Association). I would like to ask for their help or petition them to add:

### #4 – ONLY SURF DEEP WATER – 12FT OR MORE!

YOUR BOAT IS POWERFULL AND CAN DAMAGE FISH HABITAT IN SHALLOW LAKES AND BAYS, SHALLOW WATER ALSO RESTRICTS YOU'RE BOATS ABILITY TO GIVE YOU THE BEST WAVE.

It would be great if we could also add this to our landing signs or make new ones.

Furthermore we could put a sign at the entrance of the lake stating that it is a shallow lake and wake surfing is not allowed or not recommended.

I'm presenting this research out of concern for the lake I have come to love. I hope you find the information valuable and will consider it when deciding where to wake surf. If you have any questions on my research or would like copies of studies being conducted in the US and Canada, please contact me at: [MIDLAKEWAKE@GMAIL.COM](mailto:MIDLAKEWAKE@GMAIL.COM)

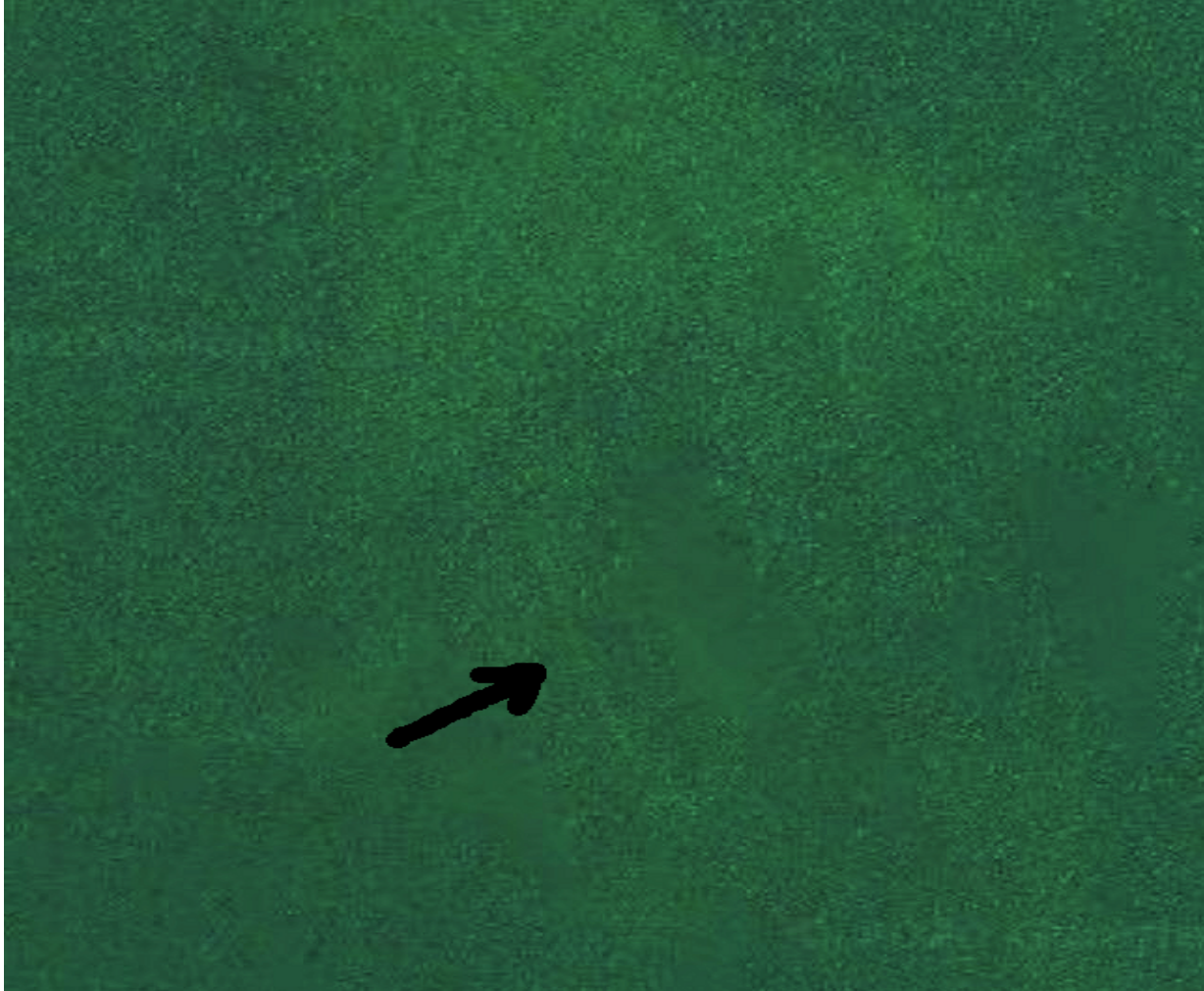
John Johnston



## Attachment 1:

Satellite image – google earth 10/02/20 “The Boot Jack” (aka: “Table Top” - N45° 49.481; W089°38.596’).

Even though this satellite image was taken on a wavy day, you can still make out furrows in the lake bottom.



## Attachment 2:

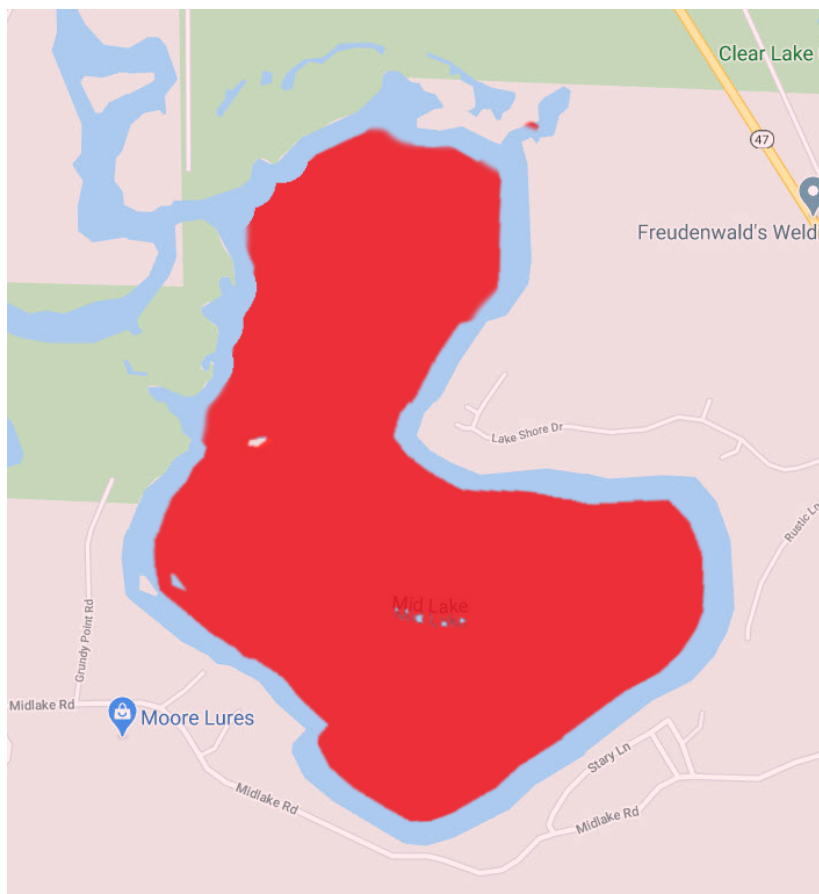
Mid lake = 221 acres = 9,626,798 SF

Shoreline 2.6 miles = 13,728 feet x 200 = 2,745,600 SF off limits.

Wake surfing area = 9,626,798 – 2,745,600 = 6,881,198 SF **(RED AREA)**

At 10mph = 52,800ft (5,280x10) x 6ft = 316,800 SF per hour.

6,881,198 / 316,800 = 22 boat hours to till the entire lake – shore to shore.



## Attachment 3:

# Town of Bass Lake, Wisconsin

## [New 700 ft Setback Requirements for Enhanced Boat Wakes](#)

[March 25, 2019](#)

A new enhanced boat wake ordinance became effective on November 12, 2018. To view the ordinance click [here](#). The essential elements are as follows:

“No person shall operate a motorboat ... on the waters within the Town of Bass Lake, Sawyer County in a manner to enhance an elevated wake for over 50 feet in length closer than 700 feet from any shoreline, dock, pier, raft or other restricted area(s) within the Town of Bass Lake, Sawyer County. An elevated wake is a trail of disturbed water left by the passage of a watercraft in excess of 24 inches. Such prohibited operation shall apply to wake enhancement watercraft by the use of ballast, mechanical hydrofoil(s), uneven loading or operation at transition speed. Transition speed means the speed at which the boat is operating at greater than slow-no-wake speed, but not fast enough so the boat is planning.”