

LOCAL REGULATION OF HAZARDOUS WAKE WORKSHOP BOATS, EQUIPMENT AND ACTIVITIES CAUSING HAZARDOUS WAKES

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INTRODUCTION

Nature has blessed Vilas County in the north woods with over 1300 lakes and 70 rivers and streams, more than any other county in Wisconsin, and one of the highest concentrations of inland fresh waters in the world. Their beauty and recreation value make them a true Wisconsin treasure. Our lakes and economy are strongly linked. **Our natural waters are the backbone of a tourist economy that contributes \$290 million of economic impact to Vilas County each year.** Wisconsin's 15,000 lakes also are central to the **state's tourism worth \$21 billion of economic impact annually.** As current stewards of our Wisconsin lakes and rivers, we have an obligation to preserve these treasures for future generations.

WHAT IS THE OPERATIONAL DIFFERENCE BETWEEN VARIOUS ACTIVITIES?

- **Water skiing**
- **Wakeboarding**
- **Wake surfing**

WATER SKIING OPERATION

- 60 to 70 feet tow rope
- 30 mph
- Plane out as quickly as possible
- Provide smooth skiing surface



WAKEBOARDING OPERATION

- When wake boarding you are using up to 65 foot long rope with a handle much like water skiing.
- The boat travels at approximately 18mph (**on plane**) and generates a medium size wake, but it is still a magnified wake.
- The wake size can be controlled and shaped through the use of wedges, flaps and ballast tanks in the stern of the boat.
- The wake boarder 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**.

WAKEBOARDING OPERATION



WHAT IS WAKE SURFING?

Wake surfing is an activity that requires a boat wake (hazardous wake) that is intentionally magnified through the use of ballast, design features, operational procedures, or any other means to amplify the wake's height and consequently **generate LARGE DANGEROUS waves**. Wake surfing involves surfing the boat's magnified wake without a tow rope, just like ocean surfing. Wake surf boats produce **wakes between 3 and 4.5 feet high, that generate waves** far more powerful than even the greatest natural wind driven waves on typical Wisconsin lakes.

The problem is the wakes create a safety hazard to everyone else using the lake, damage the environment, destroy personal property and erode the shore-line.

WAKE SURFING

- They surf, like in the ocean, without a tow rope, 5 to 15 feet behind the boat
- Maintains transition speed, operates at about 10 to 12 mph
- Bow up stern down
- Plowing, not on plane
- Generates ocean-like wakes 3-4.5 feet high
- Propeller is angled downward, about 40 degrees below horizontal
- Causes excessive propeller wash 20 feet below the surface
- Creates large dangerous waves that damage the environment and property, and creates a safety hazard



WAKE SURFING OPERATION

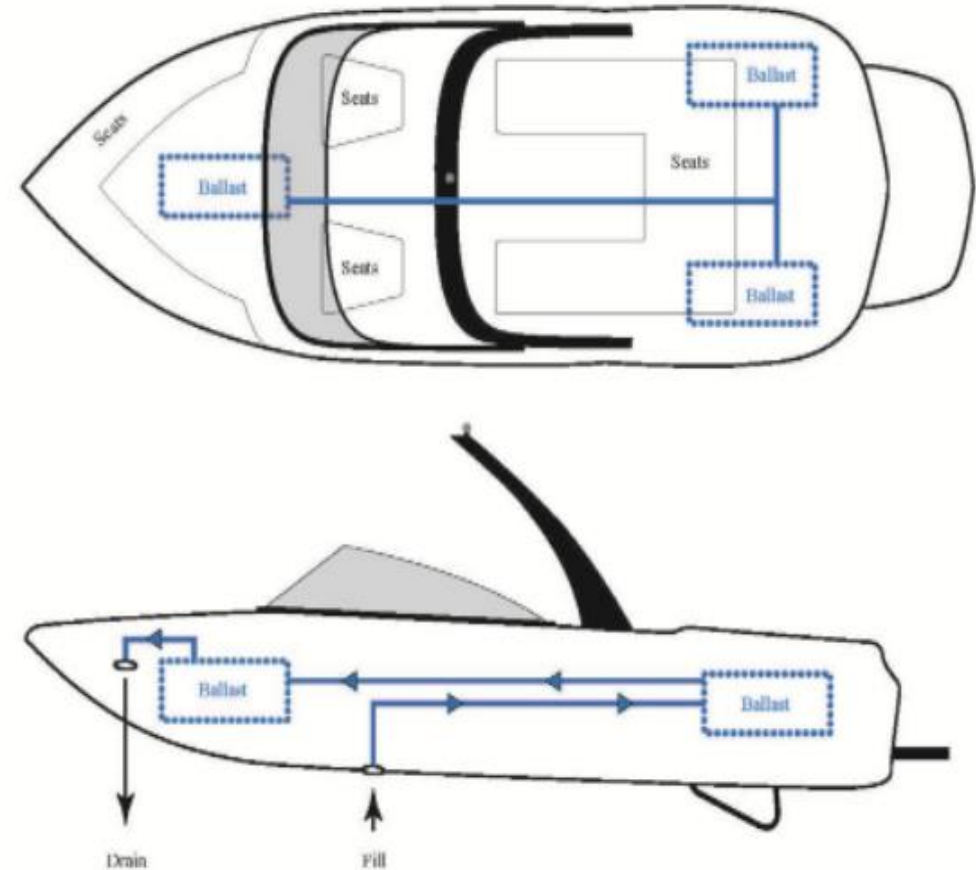


WHAT EQUIPMENT IS USED TO GENERATE A MAGNIFIED WAKE?

- Wake surfing boats have **ballast tanks and can load up to 5000 pounds (600 gallons)** of lake water ballast.
- These boats have a sufficiently large engine. Engine size varies from **350 to 600 horsepower**.
- The new wake surfing boats have hull designs and add-ons like **wake shapers** designed especially for making the wake much bigger.
- The larger wake surfing boats weigh around **6000 pounds (can be over 10,000 pounds with ballast)**.
- They can generate wakes **4.5 feet high**.

WHEREAS, boats with ballast systems increase the likelihood of aquatic invasive species being introduced and spread on lakes

- The ballast systems are often located in storage compartments and cannot be easily accessed.
- Ballast tanks cannot be drained completely and could contain residual lake water contaminated with aquatic invasive species.
- Many ballast tanks are totally enclosed so they do not dry out.
- Most ballast systems do not have inspection ports so they cannot be checked for residual lake water.
- My fishing boat live well can be completely drained, inspected and very simply disinfected.



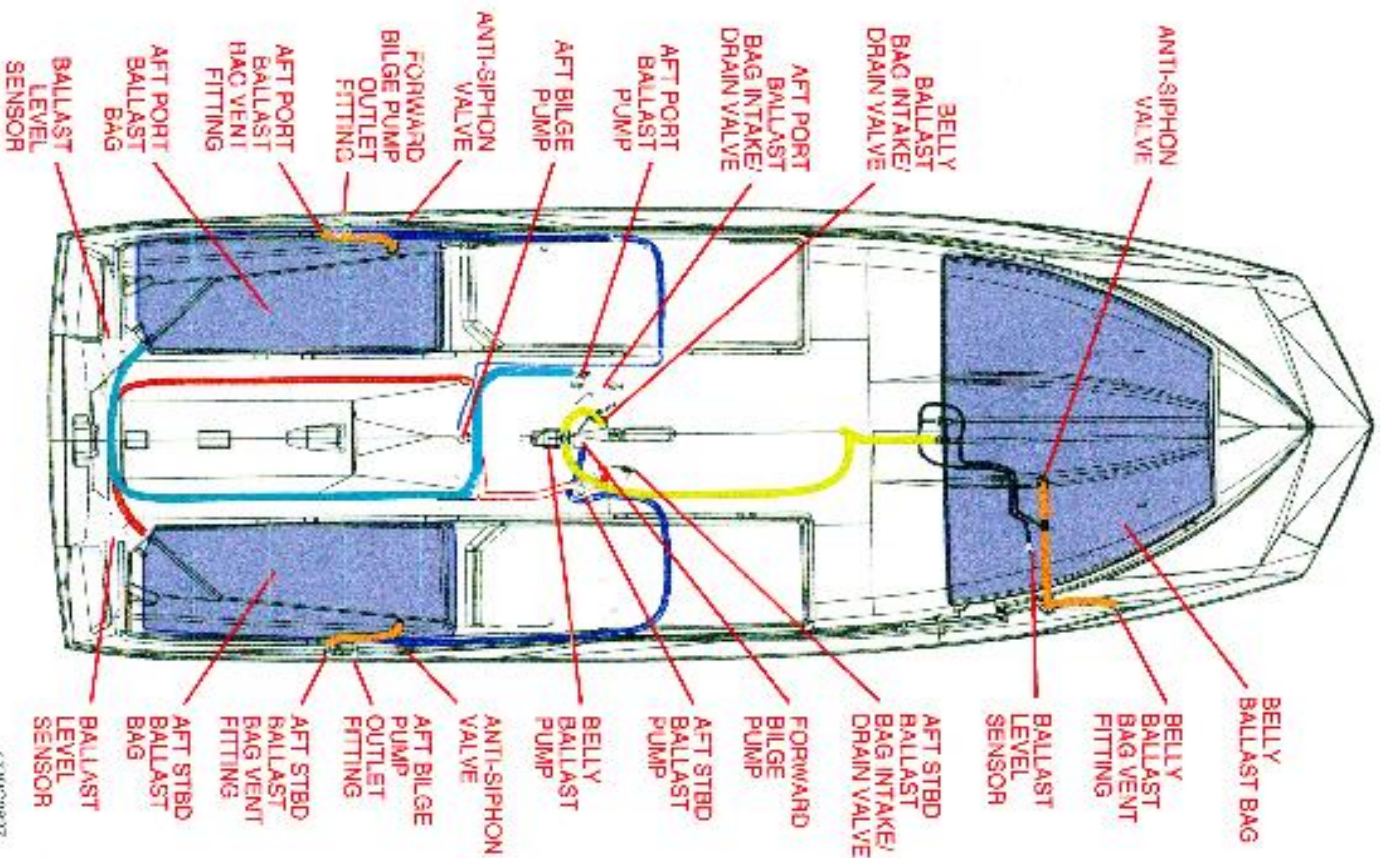
DESIGN ELEMENTS, VARIABLE BALLAST TANKS

- Ballast Bag 1100lbs



Section 4

Ballast Bag and Bilge System - PG23, PG25, G21, G23, G25 (Standard)



FROM THE NAUTIQUE WAKE BOAT MANUAL

Nautique G-23 instructions on how to winterize the ballast tanks

Winterizing Ballast Tanks (if equipped) It is extremely important to protect the Flight Control System during freezing temperatures and during long periods of non-use. When following this procedure, remember to protect our natural resources by using environmentally friendly products; and to always discard in an environmentally friendly manner.

1. Make sure your boat is out of the water, the tanks are completely drained and the tank water intake/drain valves are open.
2. Use a 50/50 mixture of an environmentally friendly antifreeze and fresh water.
3. **Pour an even amount, approximately 1 gallon (3.8 liters) of the antifreeze mixture into each tank's vent.**
4. Place a container under the intake/drain of the tank you are winterizing to catch any spilled mixture.
5. Operate the pump in the drain mode for two seconds and shut off. Repeat procedure for other tank(s).
6. Close the tank's water intake/drain valves. When returning your boat back to service, drain the remainder of the mixture before getting onto the water.

FROM MASTERCRAFT WAKE BOAT MANUAL

Winterization

Ballast tanks, pumps, hoses and fittings must be properly winterized to prevent freezing damage during winter storage. Because of the complexity of preparing a ballast system for winter storage, as well as the possibility of extreme damage to the ballast system if a preparation error is made, MasterCraft recommends scheduling an appointment with an authorized dealer's service department to have a certified technician to perform all winterization procedures, including ballast winterization. MasterCraft uses a -50 F RV type, nontoxic, **propylene glycol based antifreeze** to winterize every boat built at the factory. Any antifreeze meeting these requirements is acceptable for MasterCraft engine, ballast, and freshwater system winterization. Be aware that colder climates may require antifreeze with a -100 F temperature rating.

Winterization Process

- 1. Completely empty all ballast tanks and bags of any water that may be in the ballast system.**
2. With all bags still hooked up to the system, identify the ballast thru-hull vents (see guide to each model in this Owner's Manual).
- 3. Add two gallons of -50 F RV type nontoxic propylene glycol based antifreeze to each of the thru-hull vents. Colder climates may require antifreeze with a -100 F temperature rating. (A boat with 4 ballast tanks will require 8 gallons of antifreeze)**
4. Once the antifreeze is in all ballast zones, use the manual ballast switches in the helm area to drain the antifreeze through the system. This will push antifreeze through the ballast system, across all pumps, hoses, fittings and intake valves.
5. Be cautious while using the ballast switches as antifreeze will be pumped out of the intakes mounted to the bottom of the boat. Once antifreeze begins to pump out of the boat through the 4 ballast intakes (three aft, one forward), turn the pumps off.

THE HANDBOOK OF WISCONSIN BOATING LAWS AND RESPONSIBILITIES PUB-LE-301 2022

Discharge of Waste

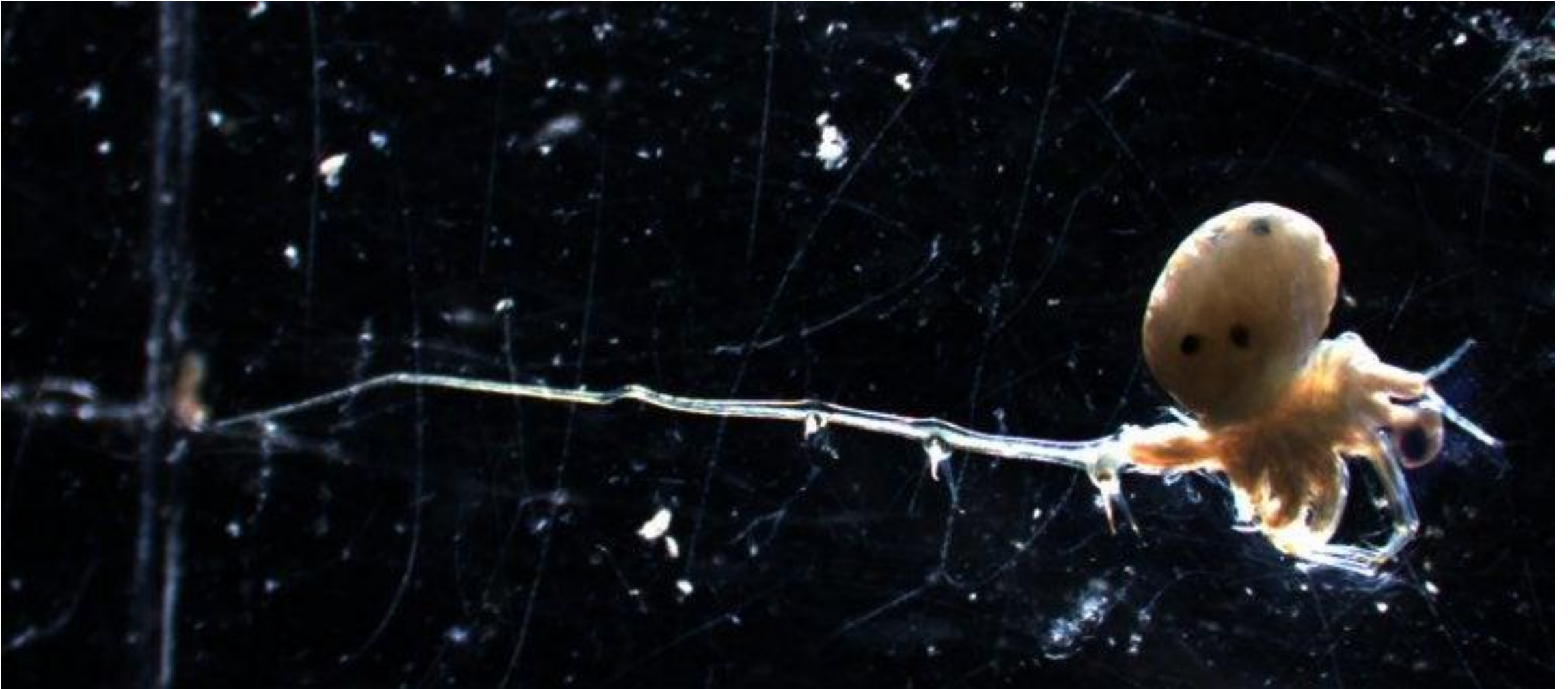
- It is unlawful to place, leave, or discharge waste or waste containers into or near any Wisconsin waters.
- **This includes anti-freeze used in winterizing your vessel.**
- Anti-freeze, both ethylene glycol and propylene glycol, is classified as a universal waste and it has specific disposal requirements.
- Refer to PUB-WA-1872-2020 for more information.

U of W STUDY “VOLUME AND CONTENTS OF RESIDUAL WATER IN RECREATIONAL WATERCRAFT BALLAST SYSTEMS”

- The study measured water left in aftermarket ballast systems in 13 boats.
- The average was **8 gallons**. Two boats retained over **20 gallons each!**
- Nine of the **13 sampled boats contained live invertebrates** after more than a week.
- They were **unable to collect residual water in 5** other boats with permanent ballast compartments, noting:
 - “The ballast systems are often located in storage compartments and can be difficult, if not impossible, for a boater to drain completely”.
 - “The closed system would not allow any amount of water to evaporate”.
 - “**The spiny waterflea**... has a dormant resting egg ... viable after years of dormancy...suited to survive long periods of time in residual ballast water”.

NASTY LITTLE SPINY WATER FLEA

It has been known since the 1980's that **BALLAST WATER** containing aquatic invasive species was **DISCHARGED** into the St. Lawrence River from European ships. From there the invasives made their way into our Great Lakes and now into Wisconsin's inland lakes.



SPINY WATERFLEA --THEY CAN UPSET THE ENTIRE ECOSYSTEM AND MAKE THE WATER MURKY

- They compete with juvenile fish for food.
- They devour beneficial algae-eating organisms, so water quality decreases.
- Spines make them hard for small fish to eat. They are a dead-end in the food web and will eventually lead to fewer big game fish.
- **There is currently no way to eliminate them.**
- They are in Trout, Star, Plum, Ike Walton and Stormy Lake.
- Spiny waterfleas have infected more than 20 lakes in Wisconsin, 5 in Vilas County.



DESIGN ELEMENTS, SIZE OF BOAT AND ENGINE

- **Any inboard boat will work for wake surfing or wake boarding** if it has a sufficiently large engine, though the new wake boats have hull designs and addons especially for making the wake much bigger. They are typically heavier boats that displace more water as they sit deeper.
- The larger wake surfing boats weigh around 6000 lbs. and can rapidly load another 4000 to 5000 lbs. of water ballast in the stern. They can generate wakes over 4ft high.
- Engine size varies from 350 to 600 horsepower.

DESIGN ELEMENTS WAKE SHAPERS

- Wake boats use mechanical devices like **wedges** or **wake shapers** that increase the drag and force the stern of the boat further down into the water.



WHEREAS, the use of ballast and wake enhancing fins can cause unsafe operation by causing the boat to rise obscuring vision forward.

- **WHEN IN SURF MODE THE BOW CAN BE SO HIGH THE DRIVER CAN'T SEE AHEAD.**
- **THE WAKE GENERATED CAN BE 4.5 FEET HIGH.**



WHEREAS, artificially enhanced wakes can endanger swimmers, anglers, and other watercraft.

SEVERAL INCIDENTS WITH WAKE SURFING BOATS IN VILAS CO HAVE OCCURRED

- Anchored canoe collecting water samples for the DNR
- Dragon Boats practices moved off Minocqua Chain
- Numerous safety incidents have been documented
- Lake Minnetonka in Minnesota



WAKE SURFING OPERATION ISSUES

- Plowing
- Angle of prop (prop wash)

WHEREAS, operating boats in a stern down manner creates downward prop wash, disturbing the lake bottom far below the wave zone, up to 20 feet below the surface.

- When wake surfing these boats only travel at 10 to 12 mph and are **not on plane**, the term for this is **PLOWING**.
- The object is for the boat to make the wake as big as possible.



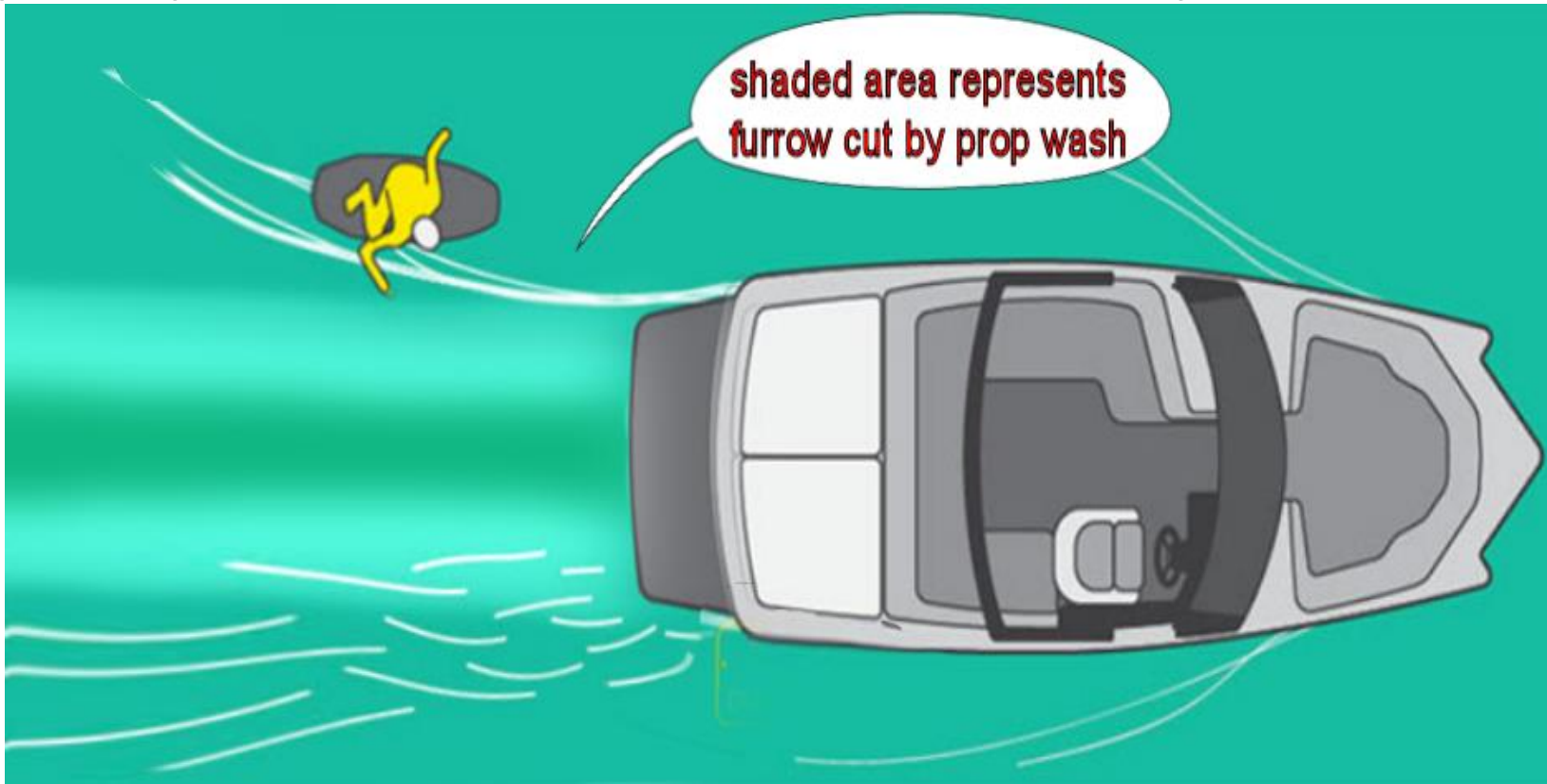
PLOWING

- On **Lake Tomahawk**, where the bottom is mostly sand and the water is clear you can see the **furrows**.
- The picture below was taken on 09/26/20 at an area known as “The Boot Jack”.
- This area is 5 to 8 feet deep and has many furrows cut by wake surf boats.



PLOWING

- One wake surfing boat can turn over the entire bottom of a 220-acre shallow lake (5 to 8 feet deep) in 22 hours.
- **5 boats** can turn over the entire **220-acre lake** in just over **4 hours**.
- With the constant agitation of the bottom in the summer months, the aquatic plants have little chance of recovery.



ANGLE OF PROP WASH

- Wake surfing boats weigh around 6,000 pounds
- Can load up to 5,000 pounds of ballast
- Generate wakes from 3 to 4.5 feet high
- Create large dangerous waves
- Angle of hull at operation is 25 degrees
- Shaft is at 15 degrees, total is 40 degrees
- Draft up to 36 inches standing still
- Prop can be up to 48 inches below the surface



OUT OF TIME, THANKS FOR LISTENING

