Submitted to council staff by Councilmember Byrd on July 26, 2019

LAKE SAMISH ISSUES REGARDING RECREATIONAL WATER USE

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JUL 26 2019

WHATCOM COUNTY COUNCIL

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LAKE SAMISH

Lake Samish is an 816-acre lake. Lake Whatcom is about 5000 acres.

Lake Samish is comprised of two basins connected by a narrow channel.

Lake Samish serves as a drinking water supply for 95 percent of the 1,300 residents that live around its shores.[1]

Lake Samish does not have a public water system. The majority of residents have their own water lines and pumps and must provide their own in-home treatment systems.

Individual property owners would have to deal with degradation of water quality and damage from aquatic invasive species, unlike Lake Whatcom water users who are served by a PUD.

[1] Lake Samish basin comprehensive storm water plan 2012

RECREATIONAL USES OF LAKE SAMISH

Non-motorized

- Swimming
- Kayaking
- Canoeing
- Pedal boats
- Paddleboards
- Rowing
- Sailing
- Fishing

Motorized watercraft

- Fishing boats
- Ski boats (wake of approximately 10 inches)

Motorized watercraft that have evolved since 1990

- Jet skis
- Wake boats (wake of approximately 20 inches)
- Surf boats create a wake that a person can surf on without a rope (wake even higher than wake boats)

Aircraft

- Take off and landing of pontoon planes (infrequent)

HOW REGULATIONS, ADDRESSING RECREATIONAL ISSUES ON THE WATER, DIFFER BETWEEN LAKE WHATCOM AND LAKE SAMISH

LAKE WHATCOM

In 1990 Whatcom County Council ruled that boats must not exceed six miles per hour (except when necessary for a safe take off as defined in WCC 11.20.010) within 300 feet from docks, floats, or the shoreline on Lake Whatcom.[2]

In 2002 the whole south bay of Lake Whatcom was set aside as a "no wake" zone based on erosion, sediment and safety concerns of the residents.

There are areas in Sudden Valley set aside for only swimming and nonpower boats.

In 2009 the operation of all two-stroke engine-powered watercraft on Lake Whatcom was prohibited with some limited exceptions.

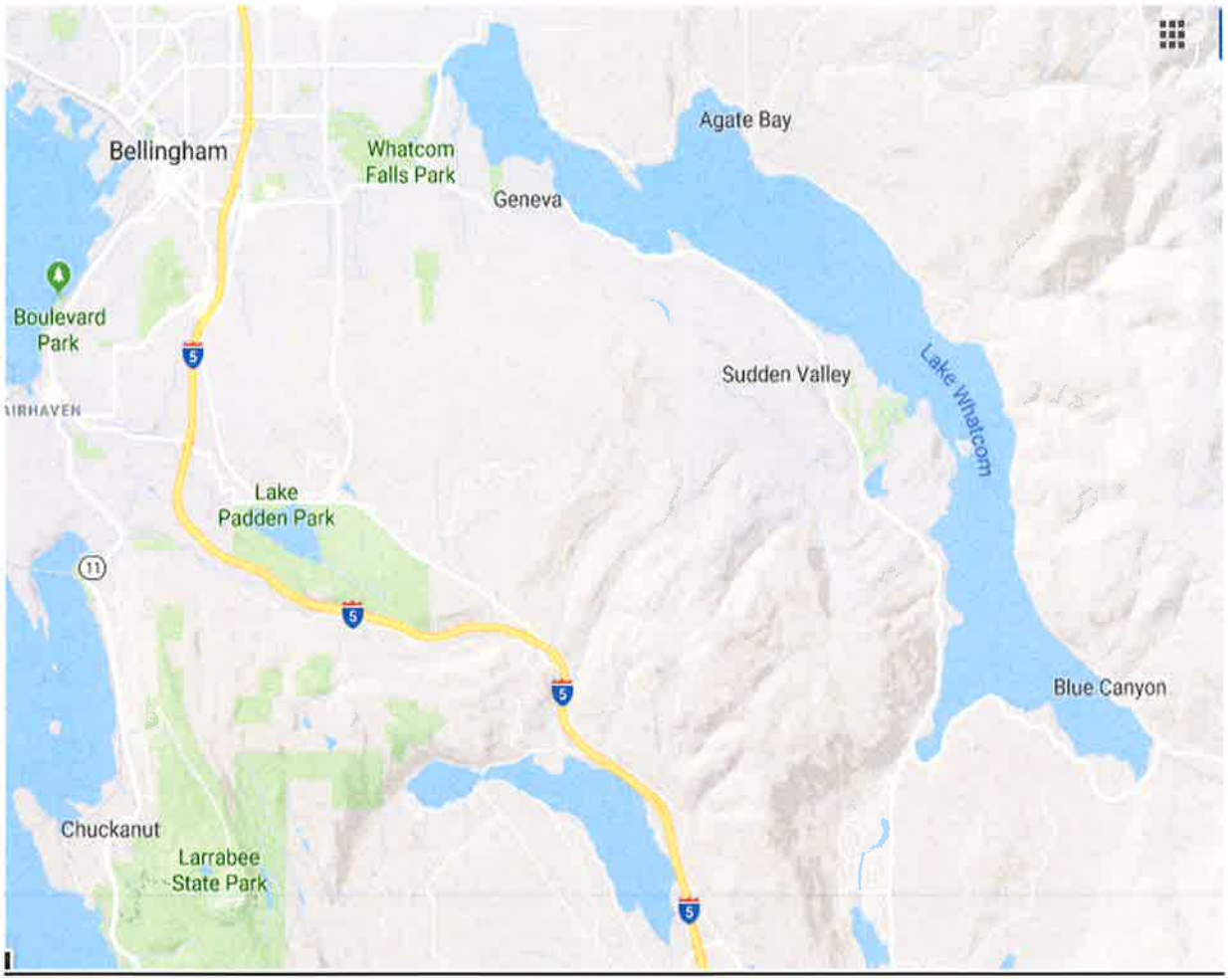
LAKE SAMISH

In 1990 Whatcom County Council ruled that boats must not exceed six miles per hour (except when necessary for a safe take off as defined in WCC 11.20.010) within 150 feet from docks, floats, or the shoreline on Lake Samish.

Lake Samish has a "no wake" zone only under the bridge.

Two stroke engines were not eliminated on Lake Samish.

[2] Whatcom County Code Chapter 11.6



Comparative view of Lake Samish and Lake Whatcom.

ISSUES RELATED TO MOTORIZED WATERCRAFT USE AT LAKE SAMISH

These issues have been building up over the years with the increase in the types of motorized watercraft that create large wakes and the total number of motorized watercraft on the lake.

- **Safety** of non-motorized recreational water users.

- **Property damage** to docks & shorelines.

- **Shoreline erosion**.

- **Protection of the road base from erosion**.

- **Increased risk to drinking water quality by AIS infestation**. Motorized watercraft transferring between bodies of water, have the potential to transport Aquatic Invasive Species. This is especially true of the watercrafts that use water as ballast to create wakes.

- **Additional negative impact from invasive aquatic species**. AIS make shoreline areas hazardous and uninviting for recreational users; they take over habitats from native species and spread toxic algae blooms.

THINGS THAT HAVE CHANGED SINCE 1990 AND WHY REGULATIONS NEED TO BE UPDATED

- The population of Whatcom County has increased from 127,780 in 1990 to 221,404 in 2017, an increase of 93,624 residents or **73.3%.** [3]

- The number of non-motorized recreational water users at Lake Samish has increased.

- The number of **motorized watercraft using Lake Samish has increased significantly.** Data from the AIS inspection reports show the increase over the past three years. Imagine if we could extrapolate what that increase has been over the past 29 years.

Data from AIS reports	Boats inspected at Lake Samish public boat launch April - Sept	Boats inspected **only during the month of July**
2016	1963	419
2017	2551 (+588 from previous year)	789 (+370)
2018	2782 (+231)	1033 (+214)

[4]

These numbers do not reflect the number of boats operated on the lake by residents.

- The types of motorized watercraft and the ways they are used has changed. Users of wakeboards, tubes, jet skis and now surf boats **prefer a substantial wake**.

- The **size of wakes** created by motorized watercraft has increased significantly and manufacturers are expected to continue that trend.

- **Regulations** related to dock repair and replacement have increased significantly resulting in increased cost to property owners.

- **Property owners are restricted** from performing interventions on the shoreline to prevent or repair erosion or property damage.

- The **potential for contamination** by aquatic invasive species has increased due to transfers of motorized water craft between bodies of water within the state and from other states and the types of boats being used for recreation.

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[3] Whatcom County census www.co.whatcom.wa.us
[4] Whatcom County AIS reports 2016-2018

WAKE SIZE

"Wave height is one of the most important factors in shoreline erosion, property damage and safety issues. Observations made by the Minnesota Department of Natural Resources have shown that:

A wave that is 12.5 cm high (4.9 inches, the height of a compact disk case) when it reaches the shore does not cause significant shoreline damage. Waves this high are created by boats operating at speeds under 10 km/h (**6mph**) a speed that is generally considered reasonable when operating close to shore

A wave that is 25 cm high (9.8 inches) is **four times more destructive** than a 12.5 cm (4.9 inch) wave

A wave that is 62.5 cm high (24.6 inches) is **25 times more destructive."** [5]

For some boaters however, it is all about the wake size: the bigger, the better.

"Wakesurfing was introduced over a decade ago and has exploded in popularity over the last few years. How do they make those giant waves? There are actually four factors.

Ballast. The wake behind the boat is mostly attributed from water the boat has displaced. The heavier the boat, the more water displaced, the bigger the wake. A wake boat fills its ballast tanks to increase the boat's displacement. ...**an extra 1,000 to 3,000 (a few models boast 5,000) pounds of water ballast is taken into the boat to increase the wake.**"

Flow of water. Each boat manufacturer has their own proprietary systems to shape wakes.

Hull Design. As a general rule, the hulls are deep V designs ...the angled running surface helps shape long, powerful waves.

Propulsion system. Moving all that displaced water takes a lot of power. Horsepower on a 20 foot surfboat is generally substantially higher than a typical runabout. **Start at 250-hp and go up from there.**[6]

Many boats designed to produce a significant wake are longer than 20 feet and powered accordingly.

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[5] https://foca.on.ca/wp-content/uploads/2014/06/Watching_Your_Wake_for_use_by_other_lakes.pdf
[6] http://www.boatus.com/magazine/2018/april/wake-boats.asp

THE BIGGEST WAKESURFING WAVE ON EARTH

The Pavati AL24 and AL26 wake surfing boats throw the best wakesurf waves on earth, courtesy of Pavati's 100% aluminum construction, nearly 6,000 lbs of hard-tank ballast and our revolutionary Rip Tide™ Surf System. The AL Series wake boats took what fiberglass competitors' waves lacked and engineered the ultimate wakesurf wave with more height, length and push than any other wave ever produced. The only real competitor to a Pavati wave is an ocean surf wave. Once you ride behind a Pavati, you'll never go back.

YACHT-CERTIFIED AL26

The AL26 is large enough to be yacht certified, which means a world-leading amount of water displacement. The size of an *un-ballasted* AL26 wave is larger than any other wake boat wave, and you can add up to 6,000lbs of ballast.[7]

[7] https://www.pavati.com/the-biggest-wake-surfing-wave-on-earth

PROPERTY DAMAGE AND DOCK REPAIR

Dock construction and repair are subject to the Shoreline Regulations Act, which has increased the cost tremendously to shoreline property owners. Docks that could withstand the volume and type of watercraft that were common for motorized recreation in the past can no longer hold up under the repetitive damage of the larger wakes today.

In 2011 a new dock, built on Lake Samish, that was designed by an engineer and met all the necessary shoreline permits cost the property owner $40,000.

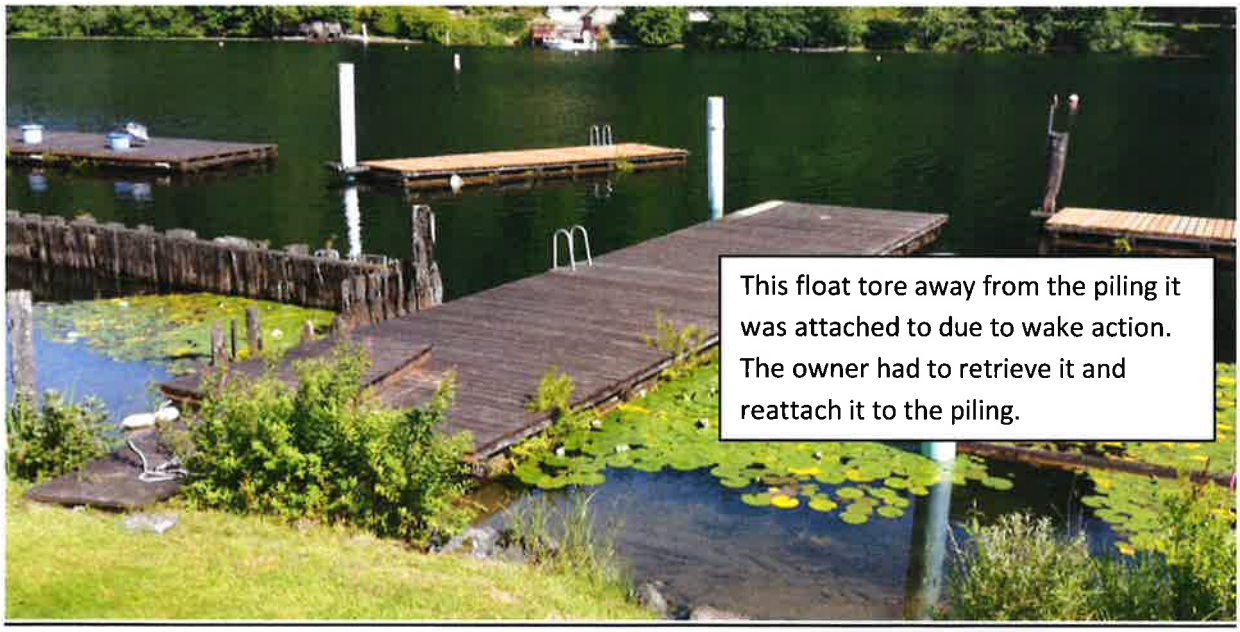
In 2018 another property owner received verbal bids of $40,000 to $50,000 for dock and ramp repairs.

Each of the 16 letters from Lake Samish residents speaks to property damage with one party spending $20,000 in repair costs.

In 2018, a Lake Samish property owner received a quote of $25,000 to replace just the float portion of his dock.

This is a photograph of the float that would cost $25,000 and that is just for the float in the water, not pilings, ramp or upper deck structure.

The original piling guide was attached with six inch lag bolts which were torn out of the dock by wake action. The replacement pile guide cost $160 x2 then required modification for an additional $100 to fit the piling (total $420). On top of that would have been an installation charge.



This float tore away from the piling it was attached to due to wake action. The owner had to retrieve it and reattach it to the piling.

This boat house belongs to Gary Simon. Boathouses can no longer be built on the lake. Gary's is one of about three that have existed on the lake for many years. This is what Gary has to say about damage to his property.

"I was born and raised in Bellingham and have lived on Lake Samish since 1981...Prior to the development of wakeboarding, Lake Samish was known as a great water skiing lake. The lake is smaller with longer periods of calm water than Lake Whatcom. In addition, in the 80's and early 90's boats were being designed with flat bottoms for the purpose to deliver minimal wake.

Fast forward 35 years and now we see today wakeboard boats designed to produce the largest wake possible. Boats have been specifically designed with fins along with large water bladders in the stern to produce maximum wake height. More recently, wake surfing has become very popular. 2 – 3 individuals sit on the corner of the stern to produce a wave actually large enough to surf. A tow rope is not even used.

When these waves reach the shore they are approximately 2' – 3' in height and the damage that they are causing to both the docks and shoreline is substantial and will become even more dramatic over time.

I have had more damage to my dock, boathouse and boat ramp in the last 5 years than my property has ever experienced in the all years I have lived there. Recent verbal bids for repairs are between $40,000 - $50,000. "

EROSION

Boat wakes cause erosion through their repetitive wave action.

"The rapid growth in the numbers and size of recreational boats is having serious ecological and social effects on the Upper Mississippi River System (UMRS). Environmental studies have shown that the height and frequency of waves generated by recreational traffic is the principal causal factor for the high rates of erosion affecting the entire streambank profile. Shorelines exposed to significant recreational boat traffic are eroding at an average rate of 2-3 feet/year."[8]

"Boat Wake Erosion is Expensive. It washes away thousands of dollars worth of land. It buries and kills fish eggs, plants, and invertebrates and disturbs waterfowl nests. Dredging downstream docks and channels also costs money. If you stand on shore when a speedboat goes by, you can see sediment lifted away by each wake."[9]

"Erosion per Hour. Each speedboat trip peels a few thousandths of an inch off shorelines. This is a lot of land, because boats travel and erode for several miles each hour. Some boats go straight; some go back and forth, eroding the same spot. Either way, boating for an hour at 20mph erodes 20 miles times 3 thousandths of an inch time two sides of a river= 50 square feet."[10]

[8] http://files.dnr.state.mn.us/aboutdnr/reports/boating/impacts_mississippi_2004/impacts_mississippi_2004.pdf
[9] http://www.boatwakes.org
[10] http://www.boatwakes.org

Erosion undercut along West Lake Samish Dr. Distance from tip of paddle to white tape is two feet. Photos on following two pages show how close the road edge is to the lake.

This is a photo of erosion at the Earle residence which is on the north bank of the small basin on Lake Samish.

This represents the typical repairs that substantial erosion can result in result in, whether caused by tree roots giving way or the bank eroding. Note extensive rock work beneath moss from road bed to below lake surface. Why not work to slow the erosion process?

SAFETY

These larger wakes are a safety issue for swimmers, children playing in the shallow water, people on their docks, non-motorized watercraft users and in some cases even other motorized watercraft users.

These are quotes from letters submitted by Lake Samish residents addressing safety concerns.

"Recently, my son was paddle boarding nearby and a ski machine turned within five feet of him at a high speed, **knocking him off of the paddle board**...and did not stop to even inquire if he was okay." Jerry Johnson

"It is now **unsafe for small children** to stand on our dock due to the wave action and small children have trouble swimming or floating near the dock for fear of being rammed against the structure while the waves from these boats are rolling in." Dea D'Acquisto-Conway

"The lake traffic this summer was intense. We were **nervous to allow our kids to swim too far off of the dock** due to boat and jet ski activity" Silas Reynolds and breAnne O. Reeves

"We have had **small children knocked over by some of the waves**....Several times our dock has been awash by the wakes breaking over the top (and our dock sits a good eighteen inches above the water." Penny Jewett

"Our dock recently has been hit by something like ocean waves. **The dock bucks and people have fallen off** when the large waves hit." Carolyn Nordtvedt

"I have lived at Lake Samish for 42 years....I have included a video of the physical impact these wakes are having on personal property and the enjoyment of swimming or sitting on one's dock**. The boat in the video is not "surfing", but is just pulling a tube at approximately 150 feet from the dock, which actually is the current setback requirement.** The video clearly captures the incredible forces generated by the wake of a typical large boat. These repeated wave poundings result in maintenance impacts that are quite significant." Patrick Curry

The online Boat Washington Course says "as you travel, look behind your vessel to check your wake. If it is rocking boats or crashing against the shoreline, you are creating too much wake."[11]

[11] https://www.boat-ed.com/washington/handbook/page/51/Controlling-Your-Wake/

EXISTING STATUS OF AQUATIC INVASIVE SPECIES

Lake Whatcom contains the following known aquatic invasive species:

- Asian clams
- Eurasian watermilfoil
- Fragrant water lily
- Purple loosestrife
- Garden loosestrife
- Curly leaf pondweed

Lake Padden contains:

- Asian clams
- New Zealand mudsnails
- Chinese mystery snails
- Red-eared sliders
- Purple loosestrife

Lake Samish contains:

- Fragrant water lily

RISK FROM AQUATIC INVASIVE SPECIES

Aquatic invasive species infestations result in a variety of economic, recreational, and environmental impacts. Depending on the species in question, they can:

- Attach to and **damage infrastructure,** boats, and water conveyance structures.
- **Clog intake pipes** and restrict the flow of water to drinking water supplies, irrigation operations, and power plants.
- **Cause long-term taste and odor problems** in drinking water.
- **Make shoreline areas hazardous** and uninviting for recreational users and property owners.
- **Take over habitats** from native species and spread toxic algal blooms.

An increasing number of boats launched on Whatcom County lakes have previously been used in quagga mussel infested waters.

Data from AIS report year	# of states / providences boats came from	Previous bodies of water visited	# of bodies of water that were quagga mussel infested
2016	39	604	33
2017	45	728	54
2018	47	806	74

[12]

[12] Whatcom County AIS reports

The potential for contamination by aquatic invasive species also is related to the increased use of wake and surf boats which use ballast tanks filled with water from the lake to obtain the weight they need to increase the size of their wakes. They discharge that water into the lake when they want to lighten the boat prior to trailering.

It is nearly impossible for these ballast bags to be drained dry before entering another lake. There is an aftermarket filter that can greatly reduce the risk of transfer of aquatic invasive species between lakes. These filters are available as a retrofit on ballast boats and are 99.7% effective at preventing the following AIS from passing through and entering a boat's ballast or bait tanks.

- Quagga Mussels
- New Zealand Mud Snails
- Zebra Mussels
- Euirasian Water Milfoil
- Asian Clams
- Spiny Water Fleas

Teagan Ward, Aquatic Invasive Species Program Coordinator, when asked about the ability to drain these boats and the use of an aftermarket filter responded:

> "As for your question regarding boats with ballast tanks, you are absolutely correct that it is nearly impossible to fully drain them. We have often had to tell boat owners to push their ballast pumps to get any residual water out (this is better than nothing!) but we try to encourage owners of wakeboard boats to stick to one lake whenever possible. While we don't encourage them to use chemicals, adding some vinegar or a bleach solution to the tanks is a good option for decontamination (it also tells the inspector that they've been decontaminated by the smell). We have had to turn some boats away this year that have tried to launch at Samish after coming from Lake Whatcom and we've been concerned about the possibility of the Asian clams spreading from Lake Whatcom to Lake Samish. We will be working harder to educate boaters at Lake Whatcom of the importance of draining everything as much as possible before going to Lake Samish; however, that doesn't help with boats coming up from the Seattle area or from out of state. The (aftermarket) filter is being pushed in some areas as a great way to minimize the potential risk that ballast tanks pose but it does come at a cost to the boat owner. I know that some lakes in the western states were planning on banning wakeboard boats unless they had the filter. We haven't looked at that option here yet as we have a lot of wakeboard boats. Luckily, most of them are one lake only but I'll keep this in mind as we go through the data this year to see if we need to consider some more options."

What about the cost to property owners at Lake Samish if we each have to deal with our water intake systems getting clogged by AIS, or worse yet if we lose our drinking water source due to the odor and taste issues AIS can cause?

Wake WorX™

Mussel Mast'R

Mussel Mast'R™
by Wake WorX, LLC

Mussel Mast'R –

$229

Be part of the Solution! Stop Aquatic Hitchhikers with Mussel Mast'R by Wake WorX.

AQUATIC INVASIVE SPECIES FILTER SYSTEMS

Effective:

- The only "Tested and Approved" alternative to ballast tank decontamination. Mussel Mast'R Aquatic Invasive Species Filter System for Ballast Tanks/Sacs and Live/Bait Wells.

- Proven to be more than 99.7% effective at preventing the following AIS from passing through and entering the boat's ballast or bait tanks.
  - Quagga Mussels
  - New Zealand Mud Snails
  - Zebra Mussels
  - Eurasian Water Milfoil
  - Asian Clams
  - Spiny Water Fleas

Verifiable:

- "Passive System" no action is required by the boat operator for the system to work.
- Clear filter bowl allows for visual inspection of the filter element.
- "Tamper Evident Seals" are attached that do not allow the filter to be opened.
- "Date Tag" is attached to show date of last filter change (6 month maximum).

Cost Effective:

- Dealer or Manufacturer installed.
- Available on new Centurion and Nautique boats. Due to the varying number of ballast tanks and complexity please see your dealer for pricing.
- Filter changes about $50 per boat for a typical 3 pump system.

Retrofitable:

- Filter Systems can easily be installed on boats currently in use, not just new boats.

Be part of the Solution! Stop Aquatic Hitchhikers with Mussel Mast'R by Wake WorX.[13]

[13] https://wake-worx.com/shop/mussel-mastr/

CURRENT REGULATIONS TO HELP ADDRESS THESE CONCERNS

AQUATIC INVASIVE SPECIES PROGRAM

The AIS program was implemented in 2014 and applies to Lake Whatcom and Lake Samish.

Its purpose is to "stop the spread of aquatic invasive species and protect our environment, our drinking water supply, and our way of life."[14]

REGULATIONS RELATED TO LEGAL OPERATION OF MOTORIZED WATERCRAFT

These regulations and explanations were provided by Whatcom County Marine Deputy King.

"RCW 79A.60.030 Operation of vessel in a negligent manner—Penalty.

A person shall not operate a vessel in a negligent manner. For the purposes of this section, to "operate in a negligent manner" means operating a vessel in disregard of careful and prudent operation, or in disregard of careful and prudent rates of speed that are no greater than is reasonable and proper under the conditions existing at the point of operation, taking into account the amount and character of traffic, size of the lake or body of water, freedom from obstruction to view ahead, effects of vessel wake, and so as not to unduly or unreasonably endanger life, limb, property or other rights of any person entitled to the use of such waters. Except as provided in RCW **79A.60.020**, a violation of this section is an infraction under chapter **7.84** RCW.

Whatcom County Shoreline regulation

A Whatcom County Code where a civil infraction can be issued. This regulation requires even less evidence of a violation than negligent operation. This is the code that says watercraft have to operated 150 feet from shore or docks on Lake Samish and 300 feet on Lake Whatcom.

RCW 79A.60.040 Operation of a Vessel in a Reckless Manner

This is a criminal offense and the courts have not really made a distinction between negligent and reckless when it comes to operation of a vessel. What they are requiring is damage and proof of damage, which can be very difficult to prove. The courts have reserved this offense for boating accidents."

[14] https://whatcomboatinspections.com/

REGULATIONS VERSUS ENFORCEMENT

The following information was provided Whatcom County Marine Deputy King in response to an email.

"In the case of negligent operation, the shore line distance rule does not apply. If you put a 50 ft tug on the lake and create a huge wake that travels 500 ft to shore then you would be in violation.

The shoreline distance rule is a Whatcom County Code that we can issue a civil infraction for and that requires even less evidence of a violation than negligent operation. This violation must be pretty obvious since distance is difficult to determine on the lake.

RCW 79A.60.030 Operating a Vessel in a Negligent Manner is typically what our recreational boating safety deputies will enforce. The penalty for this violation is a civil infraction, which means a deputy is required to witness the offense, but it is easier to enforce because there does not need to be any damage and we don't need to prove any damage.

So, the WCSO approach is to collect information of vessels that have a history of operating without regard for property. We try to monitor these vessels and if witnessed, we cite for the civil infraction.

Lastly, the WCSO patrol schedule. Our schedule is quite random, but WA State Parks requests that we provide patrols on Fri, Sat, or Sun during the summer. We currently try to provide a patrol on at least one of our many waterways on each of these days focused on the busiest locations with the most violations. We currently divide our time between Lake Whatcom, Baker Lake, Puget Sound, Lake Samish and Wiser Lake with the most active violations on Lake Whatcom and Baker Lake. We also have a staffing shortage at the WCSO and all of our boat operators work the lakes on overtime, which means giving up their days off. This makes scheduling for all of our areas of responsibility very difficult throughout the summer. "

WHAT WE ARE REQUESTING

We are requesting reasonable restrictions on one type of recreational use in order to prevent or limit drinking water quality degradation, increase safety of non motorized recreational water users, decrease shoreline erosion, decrease property damage and decrease potential for damage from AIS.

- Boats must not exceed six miles per hour (except when necessary for a safe take off as defined in WCC 11.20.010) within 300 feet from docks, floats, or the shoreline on Lake Samish. This affords us protection equivalent to Lake Whatcom property owners.

- Require that boats that use water ballast tanks have a filter device (aftermarket or originally installed) to protect against invasive species for all lakes in Whatcom County.

- Expand the "no wake zone" at Lake Samish to include the channel that connects the two basins in order to decrease property damage, to provide a safer area for swimming and non-motorized boat use, and to decrease erosion. This channel is similar in width to South Bay which was set aside as a "no wake" zone based on erosion, sediment and safety concerns of residents. It includes a narrow appendage where Finney Creek enters the lake.

- Restrict two stroke engines in the same manner that they are restricted at Lake Whatcom.

- Improve police monitoring.
  - Hand out w/ list of rules. Given upon inspection.

- Create advisory group composed of stakeholders on Lake Samish and Lake Whatcom to gather information on the impact of wake/surf boats that create extreme wakes and make recommendation regarding distance from other recreational users and shoreline to provide safety, protect the shoreline and prevent property damage to docks. This group of stakeholders should include residents from Lake Samish that use the lake as a drinking water source.

We know that you have the power to enact restrictions. Prior legislation has established that counties can regulate these issues under the right of police power of each county, Article 11 of Washington State Constitution providing for public health, safety and welfare. San Juan County banned jet skis and the case went to the State Supreme Court and was upheld.[15]

This problem is not going to go away or resolve itself on its own. As the population increases, as we get more intense summer heat, as the manufacturers create boats that make bigger wakes this problem will intensify. We see these boats as the ATV's or monster trucks of this recreational industry and just as you restrict the locations that those recreational vehicles can be used, we ask you to address the appropriate location for the use of this recreational vehicle and sport.

We ask you to prioritize the need for safety, drinking water quality, property, and shoreline protection over free range wake and surf boat recreation.

[15] Weden vs San Juan County

letters from Lake Samish readers

https://www.google.com/maps/place/Lake+Samish/@48.6613592,-122.4169039,14z/data=!4m5!3m4!1s0x5485a07de00315cd:0xbdb823a602e2e0cf!8m2!3d48.6591856!4d-122.3797569

To whom it may concern,

I was born and raised in Bellingham and have lived on Lake Samish since 1981. Over those thirty seven years many changes have occurred. Some of those have improved the quality of life on Lake Samish, such as the new sewer system in the mid seventies. The water quality improved dramatically over the years. But, not all changes have been positive.

Prior to the development of wakeboarding, Lake Samish was known as a great water skiing lake. The lake is smaller with longer periods of calm water than Lake Whatcom. In addition, in the 80's and early 90's boats were being designed with flat bottoms for the purpose to deliver minimal wake.

Fast forward 35 years and now we see today wakeboard boats designed to produce the largest wake possible. Boats have been specifically designed with fins along with large water bladders in the stern to produce maximum wake height. More recently, wake surfing has become very popular. 2 – 3 individuals sit on the corner of the stern to produce a wave actually large enough to surf. A tow rope is not even used.

When these waves reach the shore they are approximately 2' – 3' in height and the damage that they are causing to both the docks and shoreline is substantial and will become even more dramatic over time.

I have had more damage to my dock, boathouse and boat ramp in the last 5 years than my property has ever experienced in the all years I have lived there. Recent verbal bids for repairs are between $40,000 - $50,000.

I believe, at a minimum, the distance from the shore and or docks should be extended to 300', which is currently the regulations at Lake Whatcom. Wake surfing should be restricted to the north side of Lake Samish adjacent to I5. There are no homes on this section of the lake and therefore no docks and no damage. Preferably, wake surfing should be banished from Lake Samish entirely.

The damage that these boats are cause are putting the county in the position of liability for allowing property damage to continue. This current situation is ripe for a class action law suit to be filed. I hope the county will take the appropriate measures to help prevent further damage to our property.

Respectfully,

Gary Simon
1820 Samish Lane

Comments on dock damage, shore erosion, and safety issues at Lake Samish

September 26, 2018

To Whatcom County Council members and appropriate Whatcom County staff,

I am a resident and property owner at Lake Samish for the last 22 years, living at 921 W. Lake Samish Drive. Our property includes waterfront and a dock, and we have often spent time down on the lake. Our dock is of heavy concrete construction with the same kind of floats that are used in the commercial harbor on Bellingham Bay. The sections are connected by ¾" bolts through 4" * 8" whalers. The float weighs 33,000 pounds and the top is 20" out of the water. In the winter storms, the dock hardly moves at all. For the first 15 years we lived here, we enjoyed the use of it all year, and kept a small powerboat tied to the side. Boat wakes were moderate in size and didn't seem to be an issue.

Since that time, things have changed. From Memorial Day to Labor Day, a growing number of wake boats are being used on the lake, with every year of newer model throwing a larger and deeper wake. These boats are designed to displace a tremendous volume of water in order to create a wave literally big enough to surf on. The wakes behind these boats do not quickly dissipate. They maintain their height over hundreds of feet of travel, crashing into docks and shoreline like a heavy on wind surf. These waves regularly wash over the top and completely across our dock. The dock movement is so violent that people stagger and have fallen trying to keep their balance. Others have had to leave from motion related nausea. Swimming near the dock is not a possibility as anything nearby gets thrown hard against the side. Two and a half years ago we had to completely rebuild our entire dock float. This year, piling hoops were ripped loose and there was damage to the area where we used to keep a boat. The shoreline is heavily eroded and is being undermined beneath trees and below the road embankment. There are areas where an entire paddle blade can be inserted into the erosion created openings along the water's edge. To my admittedly untrained eye, it appears the road-base in these areas is shifting, as long cracking in the paving is occurring above the damaged areas of shoreline. While of course there has always been wave action and erosion on the lake, the height and power of a wave generated by a wake boat is far beyond the past norm. They are damaging personal property and public property alike, and create a safety issue for others using the lake in traditional manners. They also raise additional questions about the transfer of invasive species: wake boats create extra displacement by pulling water into ballast tanks. These tanks can't be easily dried out or inspected as required by AIS. Asian clams have already been identified as an invasive species in Lake Whatcom and boat owners within the county often use both lakes on differing days.

I'm requesting the County Council make or consider the following changes and/or additions to local boating regulations:

Make an immediate change to Lake Samish regulations regarding minimum distances for wake generation from docks and/or shorelines, to be at least equal to those of Lake Whatcom. Lake Whatcom has requirements that boats generating any wake to stay 300' from shores and docks in all areas, and does not allow any wake in some larger areas where there is a particular concern for erosion or safety (the entire South Bay area on Lake Whatcom is a no wake zone and is over 800' across at the center).

Lake Samish has currently only a 150' requirement. The requested change is from 150' to 300', with additional consideration for appropriate areas of safety and where public roadways are immediately adjacent to the water.

Consider the requirement for wake boats used within Whatcom County to have filters on ballast tank intakes that prevent the transfer of invasive species. These are available aftermarket, and are starting to be required by some other governmental entities. Lake Samish is the primary drinking water source for over 95% of households in the Lake Samish basin, and outflows through Friday Creek to the sound.

Additionally, there is the very real question about whether wake boats are appropriate for all lakes, of all sizes, at all. Other public areas are regulated: freeway speeds of 120 mph are not allowed even though many vehicles are capable, and noise levels are controlled through maximum decibel allowances in public and residential areas alike.

Thank you for your consideration.

James Willson

James Willson
921 W. Lake Samish Drive
Bellingham, WA 98229

Untitled

Whatcom County officials:

I am writing this letter to inform you about my concerns regarding the ballast boats on Lake Samish.

Everytime a boat goes by our dock with a wake boarder it causes our dock to move so much we are constantly repairing it. We had to rebuild the dock a couple years ago and every summer we have to do repairs to it caused by the wakes. Our 17' boat is thrown about so bad it rips our cleats out. Our dock is about 20" above the water but waves wash right over it. This year we had to replace 32" bolts that broke from all the wear and tear caused by the large wakes. Most of the docks on this lake are wood and putting in a new 150,000.00 steel dock isn't an option for most of us.

If little kids are on the beach they run because they are afraid of the waves.

The neighbors to the right of us just gave up and sold their boat and never use their dock. They repaired it just too many times. When they stood on their dock they had to hold onto a piling or they would have been tossed in the lake from the large wake. The sound of the waves hitting the shore line makes me think we live in Hawaii and not our little lake.

Of course erosion is a main concern for everyone on Lake Samish.

Thank you,

Jim and Lynne Glenovich

I moved to Lake Samish in 1984 and have a dock on the lake. The dock is a short distance south of the bridge and within the narrow neck of the lake, about 50 feet from the start/end of the current no-wake area. In my 34 years as a resident, I have noticed negative changes in the travel of boats on the lake, as well as the type of boats...and their effects on swimmer safety, dock repairs, and shore erosion. I would not have written this letter during the first twenty-five years on the lake, as most of the boat traffic was then under control.

First, my dock is primarily used as a swimming area. My son was an avid swimmer, and still swims when he returns home for a visit. But, the swimming has become more dangerous for him and his friends. He used to often swim across the lake, while now it is dangerous for him to even swim from our dock to our buoy, which is about 100 feet from the dock. Speeding boats and ski machines constantly race by at high speeds and with little regard for anything in their path...often as close as 10 feet from our dock.

Recently, my son was paddle boarding nearby and a ski machine turned within five feet of him at a high speed, knocking him off of the paddle board...and did not stop to even inquire if he was okay. Perhaps the driver of the ski machine did not even see him. I face the same problem when kayaking on the lake.

This summer after considerable boat traffic—high speed and high-wake producing boats—I arose on July 6 and discovered half of my dock floating out in the lake. The constraining beams around my pilings had broken due to the constant wave action. Plus, from the increasingly high waves produced, my docks rock so much and high that sometimes the materials providing buoyancy under my dock end up floating free from the dock. The impact of boat wakes is increasing due to the use of surf boats and wake boats that produce extremely high wakes...they start up near my dock as it is at the end of the no-wake zone.

Also, it is depressing to see so many people even ignore the current no-wake signs. I have seen boats and ski machines pass at full speed through the no-wake area and under the bridge...sometimes even towing a skier or young kids on tubes. This occurs even after the sun has set.

The water deputy is rarely on the lake, and boaters know it...and take advantage of the situation. I do not know if education or more patrol are reasonable responses alone.

As to erosion, my neighbors and I placed cement blocks on the shore to help maintain things. It works as good as can be expected.

If people used common sense and showed respect for others—swimmers, kayakers, paddle boarders, resident's docks—this letter would not have been necessary. I write this letter in support of two things: (1) the establishment of an extended no-wake zone through the narrow neck of the lake, and (2) an extended region of 300 feet between a dock and buoy, clearly marked so that boats know they are to avoid these areas. In turn, I realize that if even if both of these actions are taken, all of the current problems will not go away—but they will be reduced. And with increased education efforts, things may get better.

Thanks for your attention to my concerns.

Jerry Johnson
935 West Lake Samish drive
Bellingham, WA 98229
360-671-3204

Whatcom County
311 Grand Avenue
Bellingham, WA 98225

9/6/2018

Dear County Officials,

I am a longtime resident of Lake Samish and am writing to express my concerns about the shoreline and property damage that is resulting from the large motor boats, specifically the 'wake boats' that are using the Lake for recreational purposes. I have visible erosion at the shore line and I have had to rebuild and repair my dock to keep it from further damage. In addition it is now unsafe for small children to stand on our dock due to the wave action and small children have trouble swimming or floating near the dock for fear of being rammed against the structure while the waves from these boats are rolling in.

Please do something to limit these kind of boats, before some serious accident happens or further damage is done to the shoreline and/or properties.

Dea D'Acquisto-Conway
1371 Roy Road

Whatcom County
311 Grand Avenue
Bellingham, WA 98225

9/6/2018

Dear County Officials,

I am a longtime resident of Lake Samish and am writing to express my concerns about the shoreline and property damage that is resulting from the large motor boats, specifically the 'wake boats' that are using the Lake for recreational purposes. I have visible erosion at the shore line and I have had to rebuild and repair my dock to keep it from further damage. In addition it is now unsafe for small children to stand on our dock due to the wave action and small children have trouble swimming or floating near the dock for fear of being rammed against the structure while the waves from these boats are rolling in.

Please do something to limit these kind of boats before some serious accident happens or further damage is done to the shoreline and/or properties.

Jay Conway
1371 Roy Road

09/11/2018

Attention: Whatcom County Officials

We would like to raise awareness around the safety of our children and property on Lake Samish.

The lake traffic this summer was intense. We were nervous to allow our kids to swim too far off of the dock due to boat and jet ski activity.

We would like to see more no-wake buoys to help increase the safety of our children, visitors and property.

In addition to the safety factor, the non-stop summer wake caused minor damage to our canoe this season, and minor damage to our dock – not to mention the 5 chairs that repeatedly fell into the lake do to our dock rocking and rolling.

We appreciate your taking the time to address to this issue.

Thank you,
Silas Reynolds + breAnne O. Reeves

931 W. Lake Samish Dr.
Bellingham WA, 98229

206.605.2314 – silasreynolds@gmail.com
206.854.5014 – breAnne@nordyway.com

John & Kathy Ploeger
631 East Lake Samish Drive
Bellingham, WA 98229

Whatcom County Council,

We purchased property on Lake Samish in 1988. During the time we have been here we have watched the evolution of boating and water sports on the lake.

Water skiing has always been a big part of boating on Lake Samish and the lake has produced many professional water skiers. There is still a water ski course at the south end of the lake.

The next water sport to come along was wake boarding, which required boats that could make a bigger wake. These boats had ballast tanks or bladders to produce a bigger wake. Since wake boards have more surface area than a slalom ski, it's physically easier to accomplish and became very popular.

In the last 3 years surfing behind a boat has become the new popular water sport. In order to make a big enough wake to surf on, not only do boats need ballast tanks, but also special fins and trim plates to create the wake of a displacement hull boat. The wakes produced are something on the order of what a 50 foot boat would create.

The waves created by these boats are by far bigger than anything Mother Nature can create on Lake Samish. These unnaturally big waves are creating havoc with the docks and bulkheads of property owners around the lake. According to the Whatcom County Code Lake Samish has a 150 foot restriction on the distance from the shore for water skiing. Lake Whatcom, however has a 300 foot water skiing to shoreline restriction. If that was applied to Lake Samish it would help in attenuating the outsized surf waves before reaching the shoreline.

Sincerely,

John and Kathy Ploeger

To: Whatcom County Officials

Insights and Thoughts about the recreational use of Lake Samish
(By a Lake Samish property owner for 33 years)

Over the course of thirty years things change and evolve. As we have adapted and changed our lake usage others have too. Technology has improved as well and provided quieter more efficient engines, but also equipment that allows one to "surf" and ride on objects that need wave action - the bigger the better. This is of concern being that Lake Samish is a smaller lake and particularly in the narrow section where the bridge is located these waves create many problems.

We know and acknowledge that these new forms of water recreation are fun, but they come at a cost which includes shoreline and property damage:

The bigger waves have caused much shoreline erosion and in one section of the county road on our frontage the county has added boulders and gravel to shore up the roadside where it was getting a large dip close to the shoulder. Waves were carving out an area underneath the road. Other areas on this section of the lake they have added logs and large boulders to mitigate the wave action. Each summer the large waves create a low bank at the waters edge as they crash in. We have had small children knocked over by some of the waves.

Our dock and ramp take a big beating from the waves created by some of these boats. We have had to replace two pilings due to the constant jarring and digging in motion from the rocking and rolling that the waves create. (A brisk wind with white caps causes little to no movement of the dock). Currently we have been replacing the pipe from the ramp to the dock every two years. The first fifteen/twenty years we were here we never had to replace it. These bigger waves are quite damaging.

Several times our dock has been awash by the wakes breaking over the top (and our dock sits a good eighteen inches above the water). Often times persons on the dock and or their belongings get quite wet. This is caused not only by the larger wakes but also by boaters who don't respect the 150' rule that is in place now. Which points to the problems of safety and enforcement that have been recurring more often recently. We are witnessing greater disregard of county and state regulations every year, ie; skiing/surfing without life jackets, no spotter, skiing and high speed operation after dark, skiing close to shores, skiing under the bridge. There are numerous boats without current registrations, AIS stickers, I doubt many persons have the required boaters license, or operate age appropriate horse power watercraft. We see young kids operate high powered jet skies on a daily basis.

In trying to come up with a solution to these problems the only suggestion that seems sensible is to make the lake rules at Lake Samish the same as at Lake Whatcom. Boats creating wakes should remain 300' from shore. This will help somewhat with out having to come up with elaborate wake measurements etc. Also at least some attempt to educate and enforce the current rules would alleviate many of the problems.

Penny Jewett
927 West Lake Samish Dr.
Bellingham, WA

To: Whatcom County Officials
RE: Lake Samish Boating

The proliferation of larger and larger boats over the years on our relatively small lake has created greater and greater problems. These large boats and the new current fad of wave surfing are damaging docks, moored boats, and shorelines. Some of these new generation boats are specifically designed to create monster waves. We, not to affectionately, refer to them as dock destroyers. We would like to see this activity restricted from near shore areas, at least 300 feet. Lake Whatcom is a much larger lake and has a three hundred foot zone, it is time it is now applied to Lake Samish too.

Recently there has been an almost complete lack of enforcement by the sheriff's department of any basic ordinances pertaining to safe or appropriate boat operations. Without any interest on the part of the sheriff's department to educate or enforce basic expectations by all boaters any new rules would be fruitless. We are witnessing greater disregard of county and state regulations every year, ie; skiing/surfing without life jackets, no spotter, skiing and high speed operation after dark, skiing close to shores, skiing under the bridge. There are numerous boats without current registrations, AIS stickers, I doubt many persons have the required boaters license, or operate age appropriate horse power watercraft. We see young kids operate high powered jet skies on a daily basis. If you are not going to enforce rules or at least attempt to educate requirements, why have them.

There needs to be an area extending from the shoreline which is safe for swimmers, kayakers, docks, moored boats as well as the shoreline. We do not wish authorities to become heavy handed but the rules of the lake need to be updated, the public educated, and enforcement when appropriate.

Roy Jewett
927 West Lake Samish Dr.
Bellingham, WA. 98229

To Whatcom County Officials,
During the past recent years, we are experiencing increasing damage to our dock and float caused mainly by the wake board boaters.
We feel these types of water craft should not be allowed on our small lake.

Also, speed limits should be altered or at least enforced on boaters and jet skiers. Some local boaters ignore the speed regulations before sunrise and after sunset.

These are concerns we feel need to be addressed.

Respectfully,
Ron and Jeanne Arntzen
830 Autumn Lane
Bellingham, WA 98229

Whatcom County Officials 8/24/18

RE: 873 West Lake Samish Drive Dock at Newbry Residence

We purchased this property about a year ago. In looking through the permitting documents passed on by the previous owner, the dock was designed by Dibble Engineering Inc in 2006 and approved by Whatcom County. The original design included 3 pilings with a stationary dock above the high water mark. After review by the Washington Department of Fish and Wildlife, the design was changed to include only 2 pilings and be a floating dock.

We have several concerns with this dock which we attribute to heavy boat use, and associated waves, in the immediate area. The dock is located where the lake narrows towards the bridge. This is a popular turnaround spot and a high use area for boats using the south end of the lake because the water is typically calm in this area.

1. The dock is constantly wet on top due to all the wave action splashing water onto the dock. This creates biological growth on the Trex decking and is very slippery. We have scrubbed the deck 3 times in the past 14 months but since we scrub with water only, the growth comes back quite rapidly. This creates serious safety concerns.
2. The wave action makes it completely impractical to tie our boat directly to the dock, as it would bounce up onto the dock in the large waves so boat whips were installed to secure the boat to the dock. In just 3 months one boat whip has started to pull and buckle the decking due to the prying action caused by the waves.
3. When boat waves roll towards the shore, the dock bounces to the point that one feels nauseous quite quickly and needs to hold on to the steep ramp rail at the floating dock. This also creates a safety issue.
4. The shoreline is eroding away under the narrow roadway, as the incline is quite steep in this location.

Due to safety, secure boat docking, use, and apparent permitting restrictions that limit dock design options at our property, we request that you consider extending the no wake zone from the bridge out towards our dock as well as increasing the 150' to 300' distance from the shoreline. This would significantly improve the safety of our dock while causing minimal impact to other lake users.

Regards,

Burt and Debra Newbry

360-333-5883

360-333-5884

To Whatcom County officials,

Our dock recently has been hit by something like ocean waves. The dock bucks and people have fallen off when the large waves hit. When the water is low, the back side of the dock will be on the rocks. We have tried with ropes to keep our dock from breaking apart.

The wake boats with large water bladders should be kept further away from the shoreline. Boats with water bladders should be at least 300 feet from the shore to minimize breakage of docks.

Carolyn Nordtvedt
1366 Roy Rd, Lake Samish

12

Steve & Julie Landau
Wendy & Briscoe Eisendrath
941 W. Lake Samish Dr.
Bellingham, WA 98335

To Whatcom County Officials:

We are the owners of the four-plex apartment building at 941 W. Lake Samish Dr. We are just south of the Lake Samish Bridge and have a dock in the narrow channel that connects the smaller and larger sections of the lake.

Our dock and those of our neighbors are being negatively affected by the large number of boats that exceed the no-wake postings in the area. This constant traffic at higher speeds is contributing to the deterioration of our docks. Our neighbor's dock recently broke lose due to the constant erosion and our dock needs repairs.

We also have several of our residents who like to swim in the channel off our docks. Their safety is threatened by the boat traffic at higher speeds by drivers who are not paying attention to possible swimmers in the area.

We would support a no-wake speed limit for the entire channel with buoys that would mark at least 200 feet off our docks for safety considerations.

Statement of adverse shoreline impact: Lake Samish. August 28, 2018

To whom it may concern,

My name is Dave Mauro, and I have lived at 16 Greene Point Road for the last 18 years. Over that time I have seen the advent and proliferation of both wake boarding and wake surfing, the enjoyment of which is largely reliant on creating the largest wake possible. New model boats are now designed and sold specifically for this purpose and quite easily generate waves of 3-5 feet.

While I understand the obvious enjoyment experienced by those who participate in these forms of recreation, it seems equally clear that little thought is given by them to the consequences it generates for shoreline property owners. The waves generated by these boats regularly pick my dock up and heave it against its pilings. This has resulted in three of them being sheared off at the water line. The replacement of each cost $4,000. This thrashing likewise broke up my ramp to the dock. A new ramp and the placement of reinforcing piling sleeves cost $20,000. Because the wake boarders and surfers, for some reason, strongly prefer to run as close as they can to the shoreline these wakes are that much the worse, eroding my embankment, battering my own boat moored at the dock and generally degrading the enjoyment of swimmers and paddlers.

The present code allows property owners to set buoys 150 feet out from their dock to create a safe barrier. Some wake boarders and surfers respect this boundary. Others give it no regard whatsoever. But in any case, the wake generated from such a boat 150 feet away still generates enough destructive force to cause thousands of dollars of damage per year.

If I had my way these boats would be banned on Lake Samish. Plain and simple. The next best option would be a designated wake boarding/surfing area away from shoreline homes (i.e. the stretch along East Lake Samish that runs beside I-5). Even wake boats that pass 300 feet off shore still deliver a massive landfall wave, so I'm not sure a wider boundary will remedy this problem., but I remain open to dialogue and solutions in whatever form they may be generated.

Respectfully,

Dave Mauro
16 Greene Point Road
Bellingham, WA 98229
360-739-0135
david.mauro@ubs.com

Wednesday, September 12, 2018

To: Whatcom County Council

Re: Wake Impacts to Shoreline and Property

I have lived at Lake Samish for 42 years. During this period of time, water sport activity has changed dramatically from being primarily water skiing, sailing and non-power craft. Today, the cutting-edge emphasis is "surfing" immediately behind the boat. In order to accomplish this feat, the boat must be quite large/heavy (some have internal bladders for additional weight), usually have multiple people in the stern, and be going at a slow speed to generate the largest wake possible.

Over the years and on multiple occasions I have installed orange balls approximately 75 feet from our dock as an absolute minimum swimming safety allowance for boats (150 feet has been the posted requirement for at least 40 years). These balls have been repeatedly either cut loose by propellers or cut free deliberately. I fully support people having fun with water sports; however, without clear and consistent setback requirements and adequate presence of law enforcement, the recreators often become quite disrespectful and unconcerned about their impact on others. This year there was a noticeable lack of presence by the Whatcom County Sheriff's boat patrol at Lake Samish.

I have included a video of the physical impact these wakes are having on personal property and the enjoyment of swimming or sitting on one's dock. The boat in the video is not "surfing", but is just pulling a tube at approximately 150 feet from the dock, which actually is the current setback requirement. The video clearly captures the incredible forces generated by the wake of a typical large boat. These repeated wave poundings result in maintenance impacts that are quite significant. The wave forces literally tear the lag bolts from the sub-structure (logs or beams), shear the decking screws and/or break brackets holding the sections together. Our current 150 foot setback is clearly inadequate to mitigate the recreational impacts of today's up-sized boats.

Patrick Curry
817 West Lake Samish Drive
Bellingham, WA 98229
360 395-8592

Information from AIS filter company

Information provided during a phone conversation with MaryKate who is owner of the Mussel Mast R

Installation is fairly simple you would cut the intake hose to a ballast tank

Insert the filter device and reattach the hose ends

You would attach the device to the boat using 3 screws

It should take about 15 minutes to complete

You need a filter for each ballast bag

A dealer would probably charge you and hour of time so cost depends on dealer's hourly charge

Her estimate for a boat with multiple ballast tanks would be under $900.00 (Device $230 x3=$690, filters x3= $80 total of $770 leaving $130 for labor)

Once installed you would need to change filters every 6 to 18 months (filters are designed to last 18 months but Colorado requires they be changed every 6 months by a dealer as part of their AIS inspection program.)

Filters come in a pack of 3 for $79 including shipping.

TAHOE REGIONAL PLANNING AGENCY

Mail
PO Box 5310
Stateline, NV 89449-5310

Location
128 Market Street
Stateline, NV 89449

Contact
Phone: 775-588-4547
Fax: 775-588-4527
www.trpa.org

NEWS RELEASE

Contact: Jeff Cowen, Public Information Officer, (775) 589-5278

For Release Immediately February 28, 2014

TRPA COLLABORATES ON TECH INNOVATION THAT MAKES WATERS SAFER FROM AQUATIC INVASIVE SPECIES

Lake Tahoe, CA/NV—An innovation in aquatic invasive species protection was unveiled last week at the Water Sports Industry Association's 2014 Summit that could make Lake Tahoe and recreational water bodies around the nation safer from the spread of invasive species, the Tahoe Regional Planning Agency (TRPA) said today.

Called the Mussel Mast'R Aquatic Invasive Species Filter System, the new pump system effectively filters out aquatic invasive species and their larvae before allowing them to be pumped into special ballast tanks or bladders commonly installed in boats designed for wakeboarding and other wake sports to temporarily increase the size of their wake. The system will be available through boat dealers this year.

Ballast tanks are a in the spread of harmful invasive species such as the quagga mussel and New Zealand mudsnail because they can transport live plants, shellfish, and larvae long distances and cannot be visually inspected, according to TRPA, which leads the Lake Tahoe Aquatic Invasive Species Program. Decontaminating ballast systems slows the inspection process for boaters at Lake Tahoe and raises the cost of the program. Constantly improving efficiency and the experience of boaters is a top priority for TRPA and the Tahoe Resource Conservation District (Tahoe RCD) who operates the inspection program.

"This is a great innovation from the watercraft industry that reminds us we are on a world stage at Lake Tahoe," TRPA Executive Director Joanne Marchetta said. "When we work to protect our shores, sometimes we are protecting more than our beloved lake. Sometimes we are setting an example of environmental stewardship for others."

Extensive biological testing of the filter system in Lake Mead by leading aquatic invasive species researchers at the University of Nevada, Reno has proven the system effective at keeping mussel larvae as well as other aquatic invasive species out of ballast tanks, live-wells, and bait-wells, thus eliminating the need to decontaminate those systems.

The new technology was designed by Florida-based manufacturer Wake WorkX to save boaters time and money. The company developed the system in partnership with TRPA, the Water Sports Industry Association, the Pacific States Marine Fisheries Commission, California Department of Fish and& Wildlife, and Colorado Parks & Wildlife. Boats that have such a system installed may spend less time at Tahoe inspection stations and could pay a smaller fee for

inspection services, according to Tahoe RCD Watercraft Inspection Program Administrator Nicole Cartwright.

"Our objective is to ensure Tahoe remains protected while giving boaters more time on the water and keeping the cost of the program down," Cartwright said. "Our inspectors will be watching for this new system on boats and look forward to possibly decontaminating fewer ballast systems."

This is not the first time Lake Tahoe policies have led to increased environmental protections elsewhere. In 1999, when TRPA prohibited carbureted two-stroke engines in the Tahoe Region, other water bodies, such as Donner Lake, and San Pablo Reservoir in California, followed suit with similar prohibitions on the high-polluting engines. Most recently, the National Parks Service prohibited carbureted two-stroke personal watercraft from Lakes Powell, Mead, and Havasu. Soon after the 1999 prohibition in Tahoe, scientific monitoring showed a significant drop in engine pollutants in high use areas of the Lake.

The Tahoe Regional Planning Agency leads the cooperative effort to preserve, restore, and enhance the unique natural and human environment of the Lake Tahoe Region, while improving local communities, and people's interactions with our irreplaceable environment. For additional information, call Jeff Cowen at (775) 589-5278 or email him at jcowen@trpa.org.

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Background: Lake Tahoe Aquatic Invasive Species Program

In 2009, in response to the discovery of quagga mussels 350 miles to the south in Lake Mead, TRPA implemented mandatory inspections for all motorized watercraft before entering the Lake. TRPA and the Tahoe RCD launched a broad outreach campaign encouraging boaters to clean, drain, and dry their watercraft before launching in a new body of water. Invasive species such as quagga mussels, invasive weeds and New Zealand mudsnails can severely impact native fisheries, ecosystems, beaches, and water supply infrastructure. It is estimated that an invasive species introduction to Lake Tahoe could have a financial impact of $20 million per year.

For more information on the Lake Tahoe Watercraft Inspection Program, visit www.tahoeboatinspections.com. For more information on the Mussel Mast'R or Wake WorkX, visit www.supersacr.com.

Testing of a Prototype Watercraft Ballast Tank Decontamination System

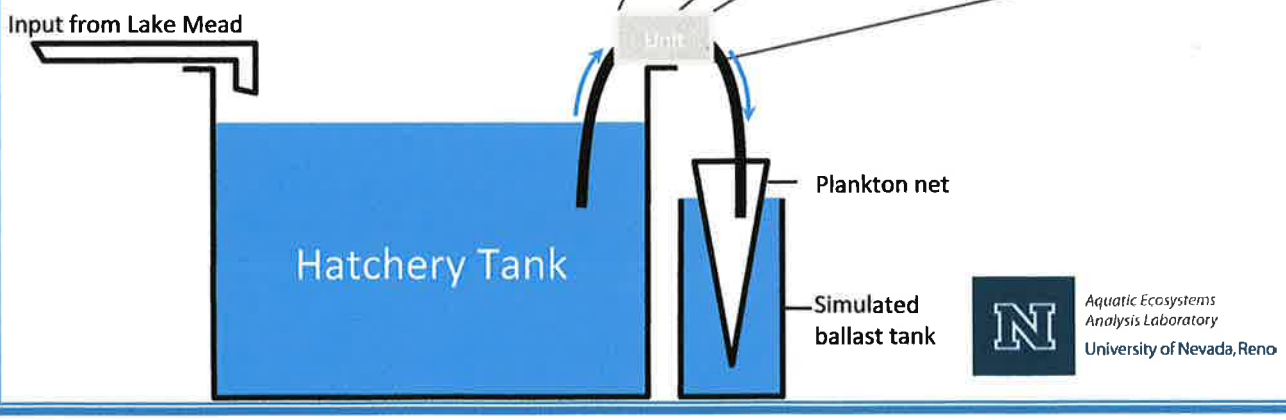
Dr. Wendy Trowbridge, Dr. Sudeep Chandra, & Dr. Clint Davis

Issue of Concern. Quagga and zebra mussels are the most economically damaging aquatic organisms to invade the United States, costing an estimated $5 billion in prevention and control efforts since their arrival in the Great Lakes in 1987. One of the largest challenges facing watercraft decontamination programs is the lack of a cost effective method to decontaminate the ballast tanks of watercraft. Currently watercraft decontamination is done with a hotwater wash or chemical treatments. This method is effective on most boat systems but ballast water systems are difficult to decontaminate and impossible to visually inspect.

Objective. Test the efficacy of a filtration device to minimize the introduction of veligers or zooplankton into the ballast water system and minimize the potential spread of invasive species into uninvaded lakes via boat ballast.

Design and testing. The prototype filtration units created by Wake WorX LLC were tested at the Lake Mead Hatchery in Nevada which has both quagga veligers and zooplankton (Figure 1). Two experiments were conducted. The 1st experiment evaluated the retention veligers when water was pumped through the filtration units continuously for 150% of the anticipated yearly usage (100 cycles or 525,000 gallons). The 2nd experiment simulated the filling and emptying of tanks by backflushing the filters for 10 min before each sample. The out flow was sampled at 10%, 50%, 100% and 150% of anticipated yearly usage. Thirty pump-filtration units were employed for each experiment.

Figure 1. (Below) Detail of the filtration unit and the experimental set up, (left) microscope counts of the plankton that passed through the filters.

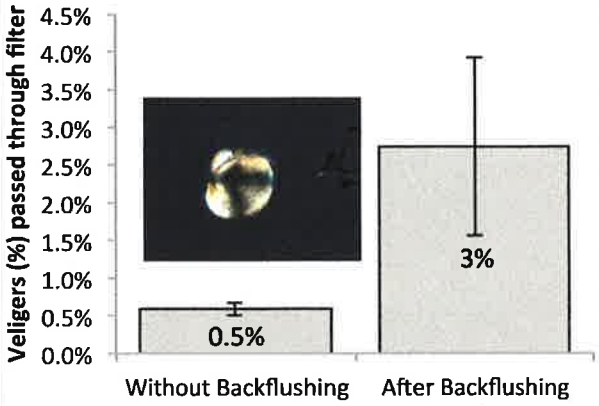


Aquatic Ecosystems Analysis Laboratory
University of Nevada, Reno

Results.

Filtration of veligers. The filtration units captured most of the veligers before they reached the ballast water tanks. 0.5% of veliger passed through **without backflushing** and 3% passed through **after backflushing** occurred (Figure 2). The efficiency of the units was variable. Many units allowed no veligers through (28% **without backflushing** and 40% **after backflushing**). Some units however, allowed more than 100 veligers (14% **without backflushing** and 5% **after backflushing**). Backflushing also significantly reduces long-term filtration performance (Friedman test p=0.030). The filtration units performed well until 150% of the estimated yearly usage (4 backflushes). Normal usage would involve 100 backflushes.

Figure 2. Quagga veliger and the veligers (%) passed through the filter.



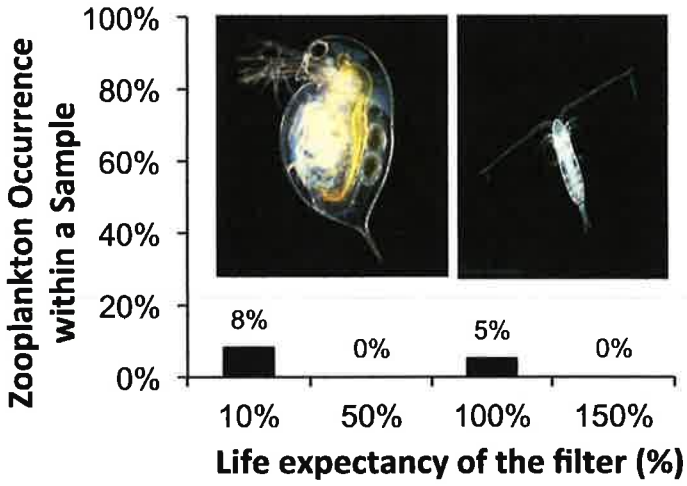


Figure 3. Two zooplankton filtered in the experiment and the (%) which occurred in a sample during the expected life of the filter. *Zooplankton were damaged after passing through the filter likely leading to poor viability.*

Filtration of zooplankton. This system may be useful for filtering invasive zooplankton *(e.g. Daphnia* and copepods, Figure 3). We evaluated the potential for filtering invasive zooplankton. The filter units passed through 5-8% of the zooplankton but all were damaged through the pump and filtration process and likely not able to survive. Thus, the filtration units are likely also good at protecting lakes from invasive zooplankton via ballast water introductions.

Conclusions

- This prototype filtration unit will retain/ damage a Dreissenid veligers & zooplankton suggesting its effectiveness in preventing the introduction of planktonic species through ballast water introductions.
- Some filters allowed veligers to pass through them especially after going above the expected life expectancy. This small percentage does not account for the fact there Is an additional low probability of survival and settlement of healthy veligers in natural waters. Thus, the combined probability of passing veligers and their settlement into a system may be low but also dependent on the boating pressure to the aquatic system.
- Veligers that passed through the filter would have to be passed through once again as water is discharged from the ballast to the lake. Thus, the risk of entering the waters could be >1%.
- Backflushing of the filters may cause some of them to fail especially after extending their use beyond the life expectancy of their operation.

Aquatic Ecosystems Analysis Laboratory
University of Nevada, Reno

Mussel Mast'R™
by Wake WorX, LLC

Thanks for doing your part to stop the spread of aquatic hitchhikers. The Mussel Mast'R filter system is designed, built and tested to be the only effective system available for keeping "Aquatic Invasive Species" out of a boat's ballast tanks.

In order for the Mussel Mast'R system to operate as designed, a few procedures must be followed.

1. **You as an Authorized Mussel Mast'R dealer must change filter elements at least every six months with genuine Mussel Mast'R replacement elements. If longer than normal ballast fill times are experienced you may need to replace the filter elements more often, depending on the water quality where the boat is operated.**

2. **The filter units must be re-sealed with genuine Mussel Mast'R "Tamper Evident Seals" each time the filter elements are replaced.**

3. **The blue "Date Tag" must be attached to the filter unit and must be filled out with the following information each time the filter elements are changed. When commissioning a new boat equipped with these filters you will fill out the "Date Tag" just prior to delivery to the customer.**

Filter Changed By:	Filter Changed Date:	Seal #:
Dealer Name	Changed on Date	Printed number from Seals

Replacement Filter Elements come pre-packaged with the required "Tamper Evident Seals" and the required blue "Date Tag". Everything needed to keep the system operating and in compliance is included in one package. These are only available directly from Wake WorX and can be ordered by e-mail from Orders@Wake-WorX.com.

Winterization: When concerned about freezing temperatures, please remove the "Tamper Evident Seals" and unscrew the filter housing. Dispose of the old element and leave the housing open. This will prevent any water from freezing and causing damage to the system.

Be part of the solution, Stop Aquatic Hitchhikers with Mussel Mast'R by Wake WorX.

Mussel Mast'R™
by Wake WorX, LLC

AQUATIC INVASIVE SPECIES FILTER SYSTEMS

WWW.WAKE-WORX.COM PATENT PENDING MARYKATE@SUPERSACR.COM

Mussel Mast'R™
by Wake WorX, LLC

User Instructions

Your Mussel Mast'R filter system is designed, built and tested to be the only effective system available for keeping "Aquatic Invasive Species" out of your boat's ballast tanks.

In order for your Mussel Mast'R system to operate as designed and for you to enjoy the benefits of the decreased decontamination times at the launch ramp, you must follow a few simple procedures.

1. **You must have your filter elements replaced by an Authorized Mussel Mast'R dealer at least every six months with genuine Mussel Mast'R replacement elements. If you experience longer than normal ballast fill times you may need to replace your filter elements more often, depending on the water quality where you operate.**

2. **Your filter unit must be re-sealed with genuine Mussel Mast'R "Tamper Evident Seals" each time your filter elements are replaced.**

3. **The blue "Date Tag" must be attached to the filter unit and must be filled out with the following information each time your filter elements are changed.**

Filter Changed By:	Filter Changed Date:	Seal #:
Dealer Number	Changed on Date	Printed number from Seals

Note: Replacement Filter Elements come pre-packaged with the required "Tamper Evident Seals" and the required blue "Date Tag". Everything needed to keep your system operating and in compliance is included in one package.

Winterization: When concerned about freezing temperatures, please cut the "Tamper Evident Seals" and unscrew the filter housing. Dispose of the old element and leave the housing open. This will prevent any water from freezing and causing damage to the system.

Be part of the solution, Stop Aquatic Hitchhikers with Mussel Mast'R by Wake WorX.

Mussel Mast'R™
by Wake WorX, LLC

AQUATIC INVASIVE SPECIES FILTER SYSTEMS

WWW.WAKE-WORX.COM PATENT PENDING MARYKATE@SUPERSACR.COM

MUSSEL MAST'R FILTER SYSTEM: INSTALLATION GUIDE

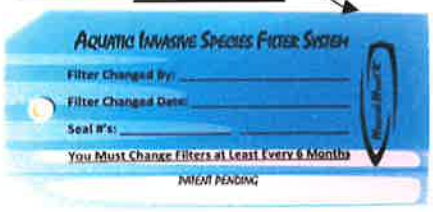
TO PUMP/TANK

FROM LAKE

FILTER UNIT, ONE PER PUMP/TANK

TAMPER EVIDENT SEAL (2)

DATE TAG



WINDSHIELD STICKER (2)

MUSSEL MAST'R FILTER SYSTEM: INSTALLATION GUIDE

FOR BOATS WITH REVERSIBLE PUMP SYSTEMS

1. You will need one Filter Unit per pump/tank combination.
2. For boats with reversible ballast pumps (Jabsco or Johnson type) the Filter Unit is installed in the fill hose between the seacock and the pump.
3. The hose run between the "Seacock to Filter Unit to Pump" should be as short as possible. Long hose runs will extend the time to prime and will slow the time to fill.
4. Filter Units must be placed in an area where an "Inspector" can see it, in the aft storage lockers along-side the engine compartment is usually best.
5. They should be mounted as close to vertical as possible and the hose leading from the seacock to the Filter Unit must be self-draining so water will drain from the hose when the boat is removed from the water.

   Note: You can change the "In" and "Out" sides of the Filter Unit by removing the 4 screws and rotating the Filter Unit 180 degrees. You then re-install the screws.

6. Once a mounting location is selected you will need to install the provided nylon hose barbs into the Filter Unit, you must use Teflon Tape on the fittings. You can use either straight fittings or 90 degree fittings as your hose run requires. However, as with any pump system, the fewer 90 degree turns the better for maximum flow.
7. Now you can mount the Filter Unit to the boat, make sure of what you are screwing into before drilling any holes!
8. The Filter Unit needs to be secured in place using #10 screws or using thru-bolts.
9. Next disconnect the hose from the "In" side of your ballast pump. A heat gun will help when removing or installing hoses.
10. This hose should now be re-routed to the "In" side of the Filter Unit and attached using a SS Hose Clamp.

11. Then using 1" Black Hose you need to cut a new piece of hose that will go from the "Out" side of the Filter Unit to the "In" side of your ballast pump. Secure the hose in place using SS Hose Clamps.
12. Next you should secure the hoses to the boat using Cable Ties and Screws.
13. Now you will install the retaining ring with the "Tamper Evident Seals". This slips over the filter bowl and has the Date Tag (which needs to be filled out prior to using the boat) hanging from it. Use the two Red Seals to secure the ring to the top bracket, cut off the excess "tail".
14. You must also install the "Windshield Stickers" on both sides of the windshield so the "Inspectors" can easily identify boats with the approved Mussel Mast'R system.
15. You should check for leaks when you first start to use the system. Air leaks will cause slow priming and will slow fill times.
16. Due to the marginally longer fill/empty times with the Filter Unit installed you may want to change the Fill and Empty times set for your boat. Your Owner's Manual will provide information on how to do this on your particular Make and Model boat.

emails from residents on Lake Whatcom

Debra Noonan <noonan.debra@gmail.com>
To:Courtney Moeller | Whatcom Rowing,bobdiehl1@comcast.net,CBHamlin1947@gmail.com
Cc:robrinewillson@yahoo.com
Apr 7 at 12:30 PM
Greetings Courtney, Bob and Charlie,

At a recent gathering of Lake Samish residents, the topic of wake surfing came up and the growing practice of increasing boat wake size by heavily weighting the stern (additional water ballast needed) so a person can "surf" the wake. The size of the wake waves and their impact on docks and shoreline, as well as the potential for carrying contaminants between water sources, was of great concern. Learning that I was a rower, Becky (copied on this email) asked if this might also be a concern of rowers generally, and WRA specifically. I volunteered to send an initial email to see if this was something you all were interested in discussing further .

Feel free to contact Becky directly for more information as I am just learning about the water issues and concerns of the area....or me if I can be helpful in some way.

Cheers,
Debra

Bob Diehl <bobdiehl1@comcast.net>
To:'Debra Noonan','Courtney Moeller | Whatcom Rowing',CBHamlin1947@gmail.com
Cc:robrinewillson@yahoo.com
Apr 7 at 1:42 PM

Debra,

You really hit a hot spot with us!!

As lake residents (we live right over the water on Whatcom) and row individually with WRA, those water ballast wakeboard boats drive us crazy. They increase soil erosion which damages landscape and increases water pollution. They also raise havoc with docks and floats.

We wonder how those kids can afford such fancy boats.

When they take a break, turn the music up and pee over the side, you can only imagine the additional "pollution".

I do my rowing early am when that kind of traffic is at a minimum, but later in the day, we have to move to the other side of the house to seek quiet comfort.

We have lived in this location for over 50 years and it gets worse each year, although the cost of inspection each time boats are launched seems to have slowed down the increase.

Yes, it is public water, but the damage caused by these boats is private.

Each summer, the sheriff patrols the lake on weekends but only at the south end, even though their boat is kept at "Mills Point". I'm not sure the wakeboard boats are breaking any laws anyway.

Thanks for your interest. Row Happy Bob

Charles Hamlin <cbhamlin1947@gmail.com>
To:Debra Noonan
Cc:Courtney Moeller | Whatcom Rowing,Bob Diehl,robrinewillson@yahoo.com
Apr 8 at 10:58 AM

Agreed! Ellen and I live on the north end of the lake near Agate Bay where the wake borders are a persistent head ache: boom boxes and heavy destructive wakes/

Charles B. Hamlin
203-434-5180
cbhamlin1947@gmail.com
3180 Edgewood Lane, Bellingham, WA 98226

Courtney Moeller | Whatcom Rowing <director@whatcomrowing.org>
To:Charles Hamlin
Cc:Debra Noonan,Bob Diehl,robrinewillson@yahoo.com
Apr 8 at 11:35 AM

I agree to all of the above. And while the number of wakesurfers on Lake Whatcom is minimal compared to the lakes I coached on in King County (Sammamish was particularly heavy with these types of boats) I have noticed, even in my short time with WRA, that the number is growing. I can't speak to the specifics of docks and floats like Bob, but they are certainly a nuisance for rowers and other self-powered recreational boats (Paddleboards, kayaks, etc). Our biggest conflict comes in the evening when we have adult learn to row classes and masters, the rest of our programming sees minimal conflicts with the exception of July and August when wake surfers seem to be out at all hours.

Courtney