



Sacheen Lake Community,

Introduction

The purpose of this letter is education of the community on the following:

- Current process for managing lake level impacts to shoreline erosion
- Information we obtained doing research on the current understanding of wake boat wake power as compared to normal boats
- Implication of the research regarding wake boat use on Sacheen Lake.

The SLA has two By-Laws Goals that are applicable to the purpose of this document as follows:

- Advocate for safe, sustainable, and clean use of the lake and surrounding ecosystems and their public access avenues.
- Promote education, involvement, and SLA membership of and by the local rural community for enduring SLA Mission Statement advocacy and a strong sense of community.

As a reminder, our Mission Statement is:

The purpose of the Sacheen Lake Association is to advocate for the conservation as well as safe and environmentally sustainable use of Sacheen Lake and surrounding ecosystems, while promoting a strong sense of rural community.

Through this letter, we hope to provide information to the community that we believe is important for people to understand how lake level management by the SLA and boat wake impact management by boat users can minimize shoreline erosion. In particular, we provide research information on the use of wake boats in surfing mode and how to best use them on Sacheen Lake to minimize shoreline erosion. With this knowledge, we hope that wake boat users will better understand the concerns of lakefront landowners and possibly limit where on the lake they use their wake boat in surfing mode. With increased knowledge by the wake boat users and use of the information, we hope that there will be less frustration on the part of our shoreline (and dock) property owners, thus creating more harmony in the community.

Lake Level Management

Historically, the SLA has worked with the Sacheen Water and Sewer District (W&S) to manage the level of the lake for the purpose of minimizing shoreline damage from boat wakes (of any kind). The W&S District requests from the State, the right to manage the lake level through the removal of new beaver dams and the clearing of 3 culverts downstream from the bridge on Fertile Valley Road (FVR). Part of this effort includes paying the person who owns the property for access to the lake from their property by the dam-clearing-crew and storage of our dam removal equipment (canoe, rakes, etc.). In return, that person also burns the wood taken out of the dams. The SLA has a designated lead for these activities, who at present is Don Hill.

The SLA also monitors the lake level to ensure that the level is not too high. There is a measuring device on one of the Fertile Valley Road (FVR) pilings. We have a historical record of



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the level, which is typically provided at the SLA Annual Meeting. The June 2022 SLA Annual Meeting presentation is posted on www.sacheenlake.com if you wish to look into the lake level history. In the past, it was determined that a lake level of 7.9 on the measuring stick on the FVR bridge piling is the ideal lake level. If the level goes below 7.9, beaver dams and the culverts are not cleared. If the water level is above 7.9, the SLA has approval from the W&S District to clear dams and/or clear the culvert grates. As many of you are aware, the lake level recently dropped four to six inches because of significant beaver dam clearing. The SLA has not had to clear beaver dams for several years due to drought conditions.

In addition, years ago the SLA reached a decision to request no wake on the lake at all, if the lake level is significantly high. In that case, the SLA sends a request to the Pend Oreille County Commissioners to announce a no wake period for the entirety of Sacheen Lake. When this occurs, there is a 24/7 ban on all boats creating wake, similar to the no-wake ban during the night hours on the entire lake. Here is a copy of the letter title of the last restrictions on Sacheen Lake (2017).

PEND OREILLE COUNTY
 NEWPORT, WASHINGTON

RESOLUTION NO. 2017-15

IMPOSING A TEMPORARY NO WAKE RESTRICTION ON SACHEEN LAKE

Clearing beaver dams and the culverts, along with resolutions by the County, has gone a long way in managing lake level to protect against shoreline erosion. However, large wakes from wake boats or any boats getting closer to the shoreline and docks than as allowed by law (100') can and does have an erosively deleterious effect on our shoreline. As boaters, we all need to remember that the 100' distance applies to docks as well. Note that most docks on Sacheen Lake protrude into the lake no greater than 40 feet (eyeball estimation). This would then require a distance of approximately 140 ft from the shoreline near docks to comply with Washington state rules. Shoreline residents have the protection of the 100' distance from their dock or shoreline as recourse against wake damage. If you see violations of this from boat operators, try to capture a picture of the boat and its license in the act and call the Sheriff's Department.

Wake Boat Wake-Power Research

Wake boats take on water in a ballast tank so their stern is lower in the water, thus changing the dynamics of the wake they produce. Wake boats, using their large wake creating mode, have changed the dynamics of shoreline erosion, churning of the bottom of lakes, and other safety aspects. Various states have begun to consider or have implemented changes in the law regarding wake boat surfing mode operations. A large wake can cause docks to have a significant amount of movement; so much so that small children, or others with lesser sense of balance, can and have been knocked off their feet on the dock, including here in Sacheen Lake.



With this knowledge and the community complaints about shoreline erosion, I, as President of the SLA, took it upon myself to look into the research on the power of wake boat wakes.

The most definitive study results I found on the Internet are from a University of Minnesota College of Science and Engineering's St. Anthony Falls Laboratory research summary.

<https://cse.umn.edu/college/news/umn-researchers-study-waves-created-recreational-boats>

The Internet article indicates the following:

“The findings reveal that wake waves produced by wakesurf boats during wakesurfing are not only higher, but they also require greater distance to decrease to the same height as wake waves from more typical recreational boats.

This study found that:

- When researchers compared the wake waves of the four boats during their most typical mode of operations, the data indicated that wakesurf boats require distances greater than 500 feet from the shoreline/docks and other boats (or the distance of a little less than 1.5 football fields) to decrease their wake wave characteristics to levels similar to the non-wakesurf boats. (Their study included two wake boats and two normal boats.)
- When researchers compared the wake waves of the four boats under conditions that generated the largest wake wave, the data indicated that wakesurf boats require distances greater than 425 feet from the shoreline/docks and other boats to decrease their wake wave characteristics to levels similar to the non-wakesurf boats.
- In both modes of operation, the suggested distance from shoreline/docks for wakesurf boats is more than twice the distance of the 200 feet currently recommended by Minnesota guidelines for common recreational boats.”

The study team indicated the following regarding the conclusive nature of the study: “... the researchers also see it as just the beginning. This foundational work has been critical as they design further studies, with future research aimed at propeller wash interactions with lake bottoms and an examination of the impact of large waves on aquatic vegetation and shorelines.”

An article by the Sierra Club indicated the following: “Additionally, the propwash points downward at such an angle that it can disturb the lake bottom at depths 16’ or more. This action reintroduces sequestered contaminants such as phosphorus and nitrates into the water column and results in algae blooms. The propwash also increases turbidity, which warms the water and makes the ecosystem less hospitable to native flora and fauna. It uproots native plants and destroys fish nesting sites.”

<https://www.sierraclub.org/minnesota/blog/2021/03/wake-boats-land-10000-lakes>

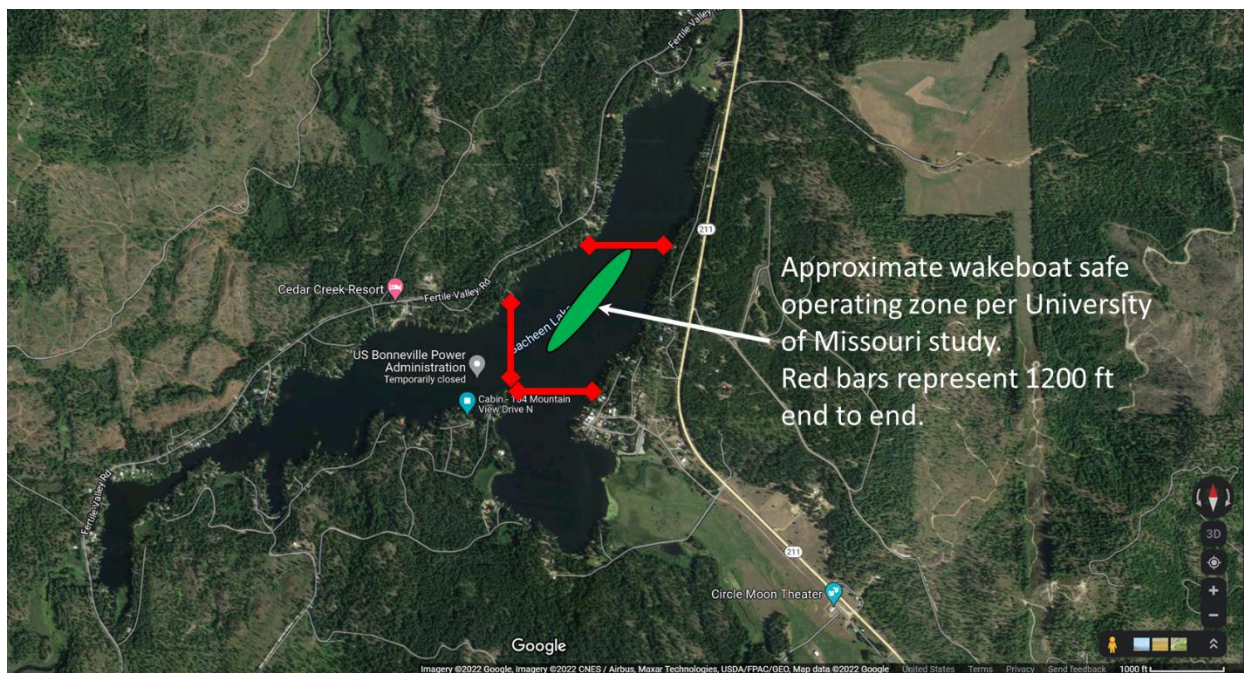
Furthermore, they provided the following recommendation (one of two): “Work on designating areas where wake boats can operate using the 1,000’ and 16’ depth guidelines until we have better data.” I believe, given the University of Minnesota study results, that their 1000’



designation was the diameter of the lake, not the distance from the wake boat to the shore, but the article was not clear on the designation.

Sacheen Lake Size as It Relates to Wake Boat Research

To determine the best possible area of wake boat use in Sacheen Lake given the UofM research findings, one only needs to look at Google Maps. Google Maps provides a scale that can be used to define a safe distance from the shoreline and / or docks for wake boat surfing mode operations. The UofM study indicated that it takes an additional 500' for the wake of a wake boat in surfing mode to reach the same height and power of a normal recreational boat. Boats are not allowed to create wake within 100 feet of shoreline or a dock in Washington State. To have a wake boat in large wake generation mode have equivalent wake power impact to the shoreline of a non-wake boat, they would need to be 100' + 500' away from a shoreline or dock in Washington State. A lake should then be at least 1200' wide to have safe operation (reduced shoreline erosion) of a wake boat in surfing mode. The embedded map shows where on Sacheen Lake the lake is wide enough to have at least 1200' of width. In practice, a lake should also be wide enough for a wake boat to make a U-turn (180 deg). Therefore, a lake should be approximately 1300' wide for wake boats to not have more impact on the shoreline than any other boat on the lake. The figure below shows where on Sacheen Lake, such a distance is close to possible.



This information did not address the issue of disturbance to the bottom, but most of the lake where boats should operate at wake-producing speeds is at least 20' deep, and likely 30' to 40' deep. In the above picture, the green zone is mostly 40' deep.



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Conclusion

The SLA actively manages the lake level to minimize shoreline erosion. Boat wake restrictions are enacted by the State or County, but as of 2022 there are no restrictions on wake boat surfing mode operations. Research indicates that wake boating in surfing mode within 100' of the shoreline on Sacheen Lake most likely causes more damage to the shoreline than normal recreational boats. The SLA has been informed by residents that they are having significant shoreline erosion. We also know that residents are frustrated by large wakes hitting their docks, and some have even gone so far as to not let grandchildren on their docks if wake boats are operating on the lake. To have a more congruous community, we ask that wake boat users seriously take into consideration the information provided herein when operating on Sacheen Lake.

We sincerely hope that this information helps the community understand how the SLA actively does and how we, as boat owners, can best manage our shoreline erosion problem. Furthermore and again, the purpose of this information is to have a more harmonious community.

Respectfully,



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