

I support SB 1589 because it reflects that the Newberg Pool is fundamentally unsuitable for wakesurfing in light of its narrow width, constant water level during the boating season, and soft soil banks. Efforts to protect this section of the river from wakesurfing have been going on for over fifteen years and it is becoming increasingly clear that more needs to be done to protect this vulnerable and ecologically-valuable stretch of the river.

This past summer, I took water quality measurements in the Newberg Pool on dates during which boats were engaged in moderate levels wakesurfing activity. A summary of my observations is attached, which documents that the high-energy waves created by wake boats are the cause of the erosion and high turbidity seen along the shorelines during the boating season.

What I observed is supported by the recent peer-reviewed study by the University of Minnesota that shows that wakesurfing boats put out 3 to 9 times more wave energy than non-wakesurfing boats at 100 feet and 3 times the wave energy at 500 feet.

<https://conservancy.umn.edu/handle/11299/226190>

Contrary to the claims by the wakesurfing industry, wakesurfing wakes do not attenuate rapidly. The University of Minnesota study found that wakesurfing boats require distances greater than 500 ft to attenuate wake wave characteristics (height, energy, and power) to levels equivalent to non-wakesurfing boats operating under typical planing conditions. This is consistent with observations in the short video I made last year.

<https://www.youtube.com/watch?v=rnOMEWxTdEc>

Similarly, wind waves are not a source of erosion in the Newberg Pool because the river does not experience much wind. The average monthly wind speed during July through September is under 5 mph and the average wind speed is less than 6 mph during the rest of the year.

Residential and shoreline development is not the cause of the erosion seen in the Newberg Pool during the summer. The attached summary focuses on the erosion seen in areas where there is no such development, i.e., the wakesurfing zones and adjacent areas.

Finally, wake boats constitute a minor part of Oregon's boating economy and reasonable restrictions will not affect it. The wakesurfing industry previously made unsupported arguments that restrictions would hurt boat sales when the Oregon State Marine Board (OSMB) adopted rules on January 27, 2021 that restrict wakesurfing on the Lower Willamette. However, boat registration information available on the OSMB website indicates that wake boat sales did not decline. Of the four most popular wakesurfing brands, 130 boats with model years from 2020 to 2022 were registered in the year following adoption of the rule compared to the 122 boats with model years from 2019 to 2021 that were registered during the year previous to the rule. Protecting the Willamette River from wakesurfing will not harm the boating economy.

Bert Krages
Lake Oswego

Newberg Pool Observations 2021 Boating Season

Bert Krages

Introduction

This report summarizes the observations I made during the 2021 summer boating season in the Newberg Pool Congested Zone. Under the rules in effect during 2021, wakesurfing is permitted only between river mile 31.8 and river mile 33.2 and between river mile 46 and river mile 47.6. The wakesurfing zones are marked on the river by buoy B at river mile 31.8, buoy C at river mile 33.2, buoy D at river mile 46, and buoy E at river mile 47.6.



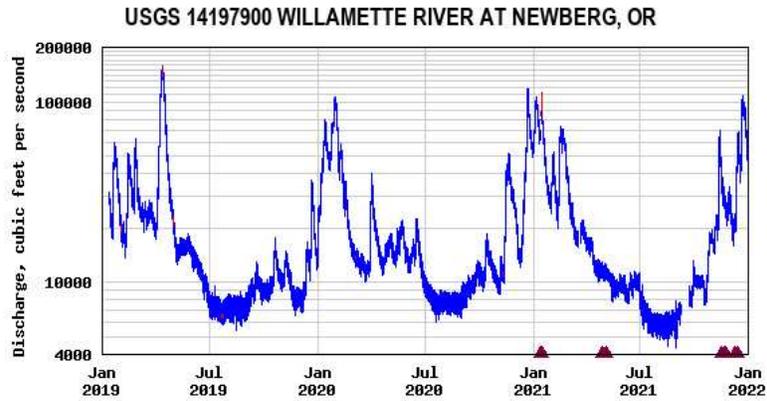
This report focuses on observations in or near the two wakesurfing zones, because some Newberg Pool residents have made dubious claims that the erosion and related problems in the Newberg Pool have been caused by winter storms and residential homeowners. However, the Oregon State Marine Board selected the two wakesurfing zones because they lack residential shorelines and river structures such as docks—factors which are not present in the wakesurfing zones. This report also considers the shoreline in the vicinity of the Champeog State Heritage Area, which borders one of the wakesurfing zones and is likewise free of residential shorelines.

Newberg Pool Hydrology and Its Relevance to Boat Wakes

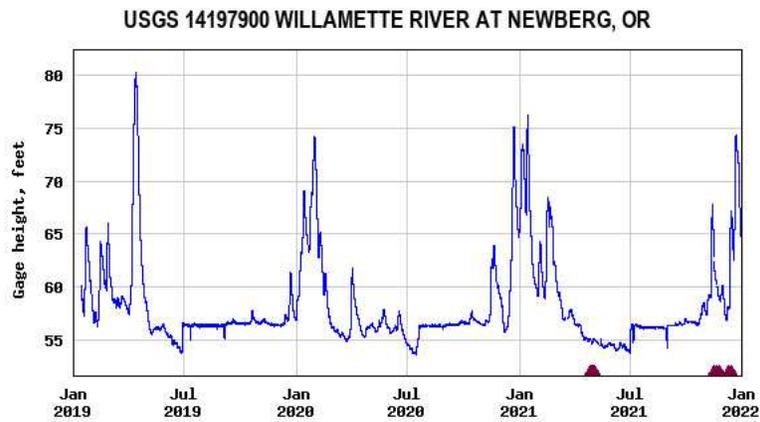
What makes the Newberg Pool vulnerable to damage from high-energy boat wakes is that the water level remains constant during the boating season. This allows wakes to repeatedly engage the same elevation of riverbank from July through September. The Newberg Pool follows an annual pattern in which the peak flows occur in December and January and the lowest flows occur from July to October. During the period from May to October, the flow is sufficiently low that the water level of the Newberg Pool is substantially determined by Willamette Falls.

Each year in early July, Portland General Electric installs flash boards around the lip of the Falls to raise the upper-river water level to improve power production at the hydropower plant at West Linn. This causes the water level of the Newberg Pool to remain nearly constant at a level

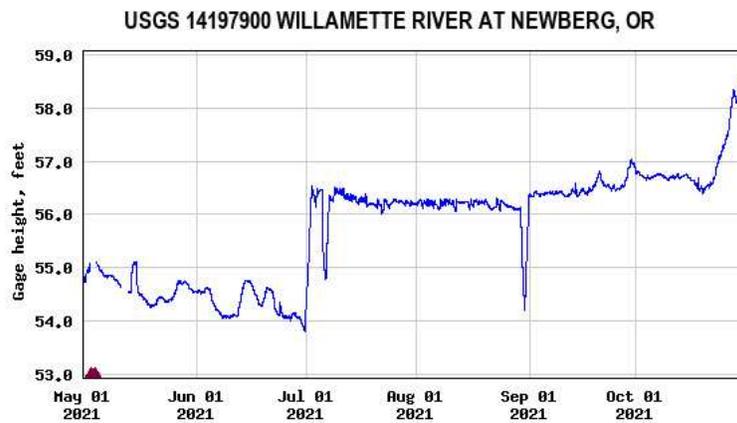
between 56.1 to 56.7 feet from July until October. Because the water level stays within a 7-inch range during the entire boating season, this narrow range of shoreline absorbs the full brunt of the wake energy from boats.



Newberg Pool Flow (2019–2021)



Newberg Pool Gage Height (2019–2021)



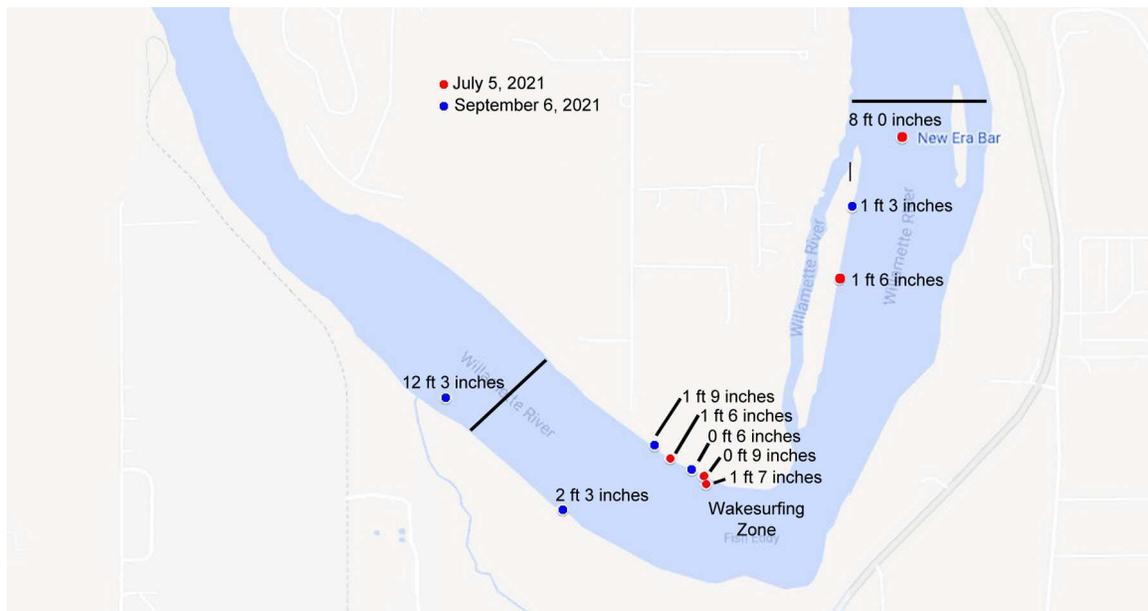
Newberg Pool Gage Height (Summer 2021)

The Newberg Pool is shielded from strong winds and has very little commercial traffic, so these are not factors in terms of wave generation. In addition, the current is very slow in the Newberg Pool during the boating season, generally between 0.4 to 0.7 knots. In contrast, the current during the peak flow months of December and January will at times exceed 3.5 knots and the water level generally ranges from 60 to 80 feet. This is important because as is discussed later, the wave scarps in the Newberg Pool are seen at the 56 to 57 foot level but not at the higher water levels experienced during the winter and spring.

Secchi Disk Measurements Show Extreme Diminishment of Nearshore Water Clarity

A Secchi disk is an instrument used to measure water clarity consisting of an 8-inch diameter plate with alternating black and white quadrants that is attached to a rope. Measurements are taken by slowly lowering the disk into the water until it is no longer visible. The depth at which the disk is no longer visible is measured and recorded as the Secchi depth.

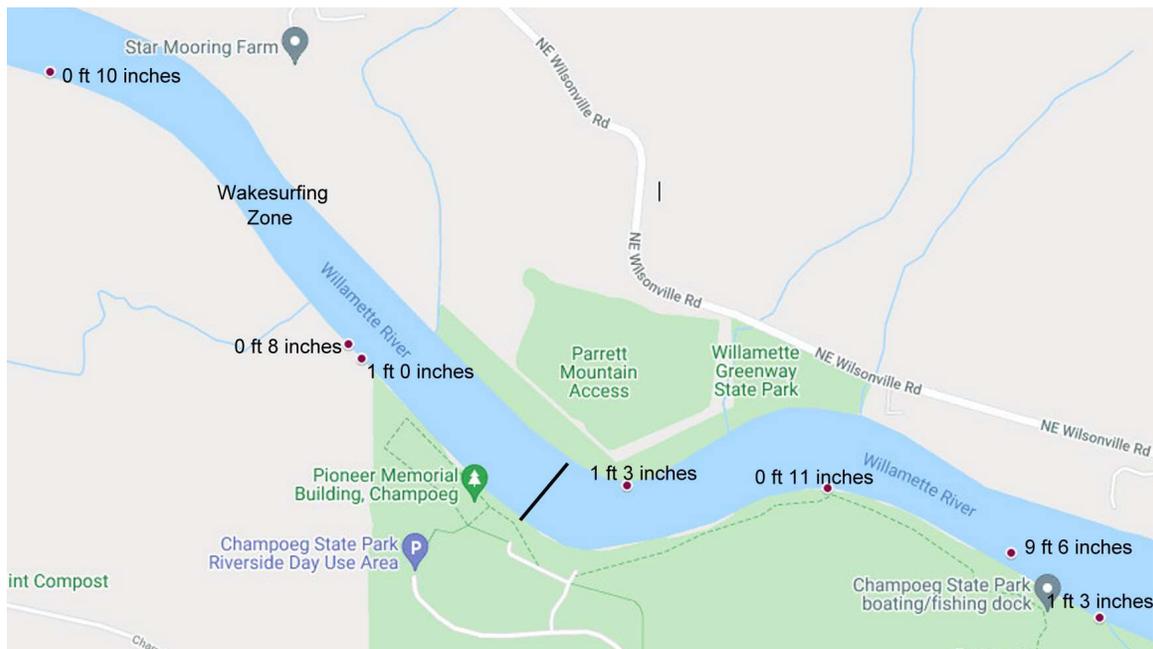
Secchi depth measurements were taken in the wakesurfing zone between buoys B and C during moderate wakesurfing traffic on July 5 and September 6. This area lacks residential development and has riparian habitat that is typical of the Newberg Pool. As the figure below shows, the mid-river Secchi depth in the middle of the river between Willow Island and the New Era Bar was 8 feet on July 5. However, the Secchi depths in the critical nearshore habitat region ranged from 9 inches to 19 inches, which reflects the high levels of turbidity that were readily visible along the shorelines. This is a reduction in water clarity of 9 to 20 percent of the water clarity observed away from the shorelines. The water clarity on September 6 was greater, with a Secchi depth of 12-1/4 feet. The Secchi depths in the nearshore region ranged from 6 to 27 inches, which reflects reductions in nearshore water clarity of 4 to 18 percent.



Secchi Depths in Wakesurfing Zone B-C (July 5 and September 6)

Secchi depth measurements were taken on July 31 in the river to the east and west of buoy D during a period of moderate wakesurfing traffic. The area west of buoy D is inside the wakesurfing zone and the area east of buoy D encompasses the shoreline of the Champoeg State Heritage Area. Residential development is absent in this part of the river and the riparian habitat is typical of the Newberg Pool.

As the figure below shows, the Secchi disk measurement in the middle of the river was 9-1/2 feet which indicates healthy water clarity. Conversely, the Secchi disk measurements in the critical nearshore habitat region along the river ranged from 8 inches to 15 inches, which reflected the high levels of turbidity readily visible along the shorelines. In other words, the water clarity was reduced to 7 to 13 percent of the water clarity observed away from the shorelines. What is also notable is the diminishment of the nearshore clarity to the east of the wakesurfing zone. Some of this diminishment may be attributed to boats engaged in wakesurfing outside the wakesurfing zone but some can also be attributed to wakeboarding and tubing, which are currently permissible for ballasted wake boats.



Secchi Depths in Border Region of Wakesurfing Zone D-E (July 31)

Wave Scarps at the 56 to 57 Foot Level Are Evidence of Boat-caused Bank Erosion

Wave scarps are present throughout the length of the Newberg Pool Congested Zone at the 56 to 57 foot elevation that is the predominant river level during July to October. These scarps are formed by waves hitting the face of the riverbank where they scour the space between the bottom and top of the waves. The photos below show scarps that have been cut into the riverbank by boat wakes. Over time, these notches enlarge into overhangs that can eventually result in a slide

once the roof of the overhang is no longer able to support the soil above. The result is a loss of river bank



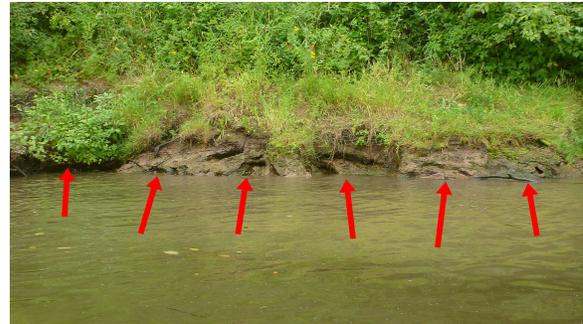
Scarp in B-C Wakesurfing Zone



Scarp in B-C Wakesurfing Zone



Scarp along Champoeg State Heritage Area



Scarp in D-E Wakesurfing Zone

The turbidity and turbulence from the boat wakes in the nearshore region interfere with critical survival activities of aquatic organisms such as feeding and prey avoidance. The settling of silt onto the nearshore river bottom also adversely affects the benthic organisms that are an important part of the river's ecosystem.

Notably, wave scarps are not seen at the higher river elevations that occur during the winter months, although the flows and currents are much higher than in the summer. If the erosion problem in the Newberg Pool were caused by natural currents, evidence of such erosion would be expected at these higher elevations.

Conclusion

The shoreline of the Newberg Pool has suffered substantial damage as evidenced by the wave scarps present throughout the Newberg Pool Congested Zone. These scarps are formed during July and August when the river is at a near-constant level of 56.5 feet and wake boat activity is at its highest. As evidenced by Secchi disk measurements, erosion of the river banks is clearly occurring during these months and the sole credible cause is high-energy boat wakes. This is further bolstered by the fact that the summer months are a period of low current in the Newberg

Pool when naturally-caused erosion would least be expected. Considering the absence of factors such as significant wind and commercial traffic, as well as reports that erosion problems in the Newberg Pool were uncommon prior to popularity of wake boats, ballasted boats engaged in towed water sports such as wakesurfing are the primary cause of erosion in the Newberg Pool.

Qualifications

B.S. in Environmental Engineering, Northwestern University

M.S. in Environmental Engineering, University of North Carolina at Chapel Hill

Registered Civil Engineer (California)

J.D., University of Oregon

Oregon State Bar Member