

## FREQUENTLY ASKED QUESTIONS FOR THE RESPONSIBLE WAKES FOR VERMONT LAKES (RWVL) ANR PETITION TO MANAGE WAKE BOATS AND WAKES SPORTS IN VEMONT

### PROMOTION OF RECREATION AND FAMILY ACTIVITIES

#### **1) Wake boating and associated wake sports activities are a great way for families to spend time together. Why are the ANR petition targeting this one group?**

By design and operation, wake boats have an outsized impact on the area they are operating in compared to traditional lake uses, e.g., paddle sports, fishing, and skiing. This impact can be seen in the size and power of the waves they generate. The petitioners are not looking to eliminate the use of wake boats on Vermont lakes and ponds; they seek to manage their use that balances the impact with more traditional uses of our lakes and ponds, a balance they believe many Vermonters want.

The [2021 Vermont Use of Public Water Rule § 2.2b](#) states: *“The public waters shall be managed so that the various uses may be enjoyed in a reasonable manner, considering safety and the best interests of both current and future generations of citizens of the State and the need to provide an appropriate mix of water-based recreational opportunities on a regional and statewide basis.”*

Vermont Use of Public Water Rule § 2.3 defines normal recreational uses as: *“fishing, swimming, boating, waterskiing, fish and wildlife habitat, wildlife observation, the enjoyment of aesthetic values, quiet solitude of the water body, and other water-based activities.”*

#### **2) Isn't a better approach to addressing wake boat concerns through increased safety education and awareness vs more rules and regulations?**

Education and awareness can and do play important roles in educating the public but through analyzing national and global research and studies on wake boats. As stated in the [ARN petition](#), the petitioners believe that current wake boat use is inconsistent with 4 Vermont lake-related statutes:

- Vermont Use of Public Waters Rules Environmental Protection Rule (*ANR petition pg 40-41*)
- Vermont Shoreland Protection Act (*ANR petition pg 41-42*)
- Aquatic Invasive Species Transport Law (*ANR petition pg 42-43*)
- Water Quality Standards Environmental Protection Rule (*ANR petition pg 12-13 and 43-45*)

As such, we requested that the Vermont Department of Environmental Conservation adopt a revised rule for managing and regulating wake boat use under the Vermont Use of Public Waters Rules statute. The RWVL petition is not without precedent—a petition involving restrictions similar to the ones proposed to the ANR was submitted for the operation of personal watercraft. This was granted more than a decade ago and remains in effect today ([ANR petition pg 45](#)).

The concerns about wake boats take on added concern in considering the next generation design for these vessels and manufacturers' emphasis in their marketing materials on creating the biggest wake [ANR petition \(pg 10\)](#). Vermont is not alone in this concern. As initiated in the [ANR petition \(pg 7-8\)](#), at least 17 states and a Canadian province have or are considering managing wake boats and wake-enhancing sports.

#### **3) Is this proposed rule a slippery slope where the ultimate goal of the petitioners is to eliminate the**

**use of powerboats on Vermont lakes and ponds?**

The petition is very narrowly focused on addressing the significant impact of wake boats. We state in our petition: *"The Proposed Rule does not apply to use of a wakeboard behind a conventional vessel that has not been modified with wake enhancing equipment."* Our intent is clear.

**SAFETY****4) How do waves from multiple wake boats create safety problems for other boats?**

As one boater stated in [the Georgia Water Environment Consultants \(WEC\) 2021 Report](#), "Two times ballast boat waves have come over the bow of my 22-ft bow boat. I felt there was a danger of sinking."

Multiple wake boats operating near one another can create massive wakes due to the additive wave heights. Besides the tumultuous jostling of swimmers and boats, these super waves can cause passenger falls from their watercraft, possibly resulting in injury.

**5) Have there ever been incidents involving a swimmer and wake boat?**

Yes. A swimmer on a lake in Vermont was relaxing while floating up and down on their back with the wave motion when suddenly the swimmer was flipped over and pulled under by the undercurrent from the wake boat (see [Appendix A](#)). Had this occurred with a less experienced swimmer or child the outcome may have been tragic. Similar anecdotal examples of wake boats endangering swimmers can be found in the [Georgia WEC 2021 Report](#).

The energy produced by a wake boat goes up as the square of the wave height (per US Army Corps of Engineers). That means a 2-foot wave is four times as powerful as a 1-foot wave, and a 3-foot wave is nine times as powerful. The corresponding safety risks and damage increase accordingly. Wake/surf boats with their lake bottom angled propellers generate wakes that are 10 to 25 times more powerful than that ski boats operating horizontally.

**6) The petition states that while wake boats currently comprise a tiny fraction of watercraft on VT lakes and ponds, they pose a safety risk that could impact the enjoyment of traditional uses and hence the associated tourism revenue. From a safety viewpoint, can you support this statement?**

While a recent survey in the ANR petition ([Table 2 pg 11](#)) showed that fewer than two percent of all watercraft on a sampling of Vermont lakes and ponds are wake boats, large wakes from these types of vessels disproportionately impact traditional uses including swimming and boating due to the increased potential for their enhanced wakes to cause flooding, swamping and capsizing. According to the [US Coast Guard data for 2016-2020](#), flooding/swamping is the most or second most common type of boating accident. "Force of wave/wake" has also been cited as a primary contributing factor to 14 deaths and 182 injuries in the US Coast Guard. [Oregon has reported from 2010 to 2017](#) that 12% of wake related injuries—including 3 deaths—were from wake-related accidents. The [Georgia WEC 2021 Report](#) and statements from Vermonters in [Appendix A](#) of the petition include first-hand accounts of the negative safety impacts on swimmers, boaters (particularly canoeists, kayakers, paddleboaters, sailors) and persons on shoreline structures. When wake boat sports are conducted, those wishing to participate in the more traditional uses report changing their plans to avoid the negative safety issues associated with the large waves.

**7) The petition states that large wakes created by wake boat sports cause injury hazards to boaters, swimmers, and those on floating structures. What support do you have for this statement?**

Support for this statement is provided in the [Georgia WEC 2021 Report](#) and the firsthand accounts from Vermonters in Appendix A of the petition.

**8) How is the safety of swimmers, boaters, and other non-wake boat activities impacted by multiple wake boats operating in the same area?**

The wakes created by multiple wake boats in the same area are amplified in an additive manner when two or more propagated wakes meet. The height and power of the resulting wakes is doubled. These massive “super” waves can jostle swimmers and boaters, causing falls from watercraft and swamping or capsizing of smaller craft including canoes, kayaks, paddleboards, and sailboats.

**9) Do residents where wake boats operate on their lakes think that they present safety issues?**

When asked in the [Georgia WEC 2021 Report](#), “Do you believe wake from wake boats create a boating safety issue?” 75% of 478 members of local lake associations responded that they do present a safety issue, compared to 18% who responded they do not. Numerous respondents gave examples of safety issues, primarily for toddlers, young children, and the elderly.

*SCIENTIFIC BASIS FOR THE RWVL'S ANR PETITION*

**10) What is the science behind the 1000 foot from shore rule? ([see ANR petition pg 13-24](#))**

*For Regulators.* In the last seven years, there have been numerous studies ([see ANR Table 3 pg 15](#)) that measured various parameters characterizing wakes produced by wake sports and how they decrease with distance from the boat trajectory. The wakes consist of a train of individual waves called a wave train. The parameters include maximum wave height, total wave train energy, and peak wave train power. The most recent study ([SAFL, 2022](#)) measured these parameters to a distance of 625 feet. When considering the shoreline impacts of wake surfing compared to traditional water sports, it is appropriate to compare wave trains from wake surfing to those of traditional uses, e.g., waterskiing. Among the most harmful environmental impacts of large wakes are shoreline erosion, shoreline structural damage, and resuspension of near shore sediments as the power of the wave is absorbed. These are all “threshold phenomena” meaning that they occur under extreme conditions that exceed a threshold. We argue that a wake surfing shoreline protection distance be defined as the distance at which the maximum power in its wake is comparable to the maximum power in the wake from waterskiing at a distance of 200 feet, the current shoreline protection distance. According to the “best fit” formulas derived from experimental data ([SAFL, 2022](#)), the equivalent distance is 1000 feet ([see ANR Table 4 pg 17](#)). While this is an extrapolation of the data in this study, a conservative approach is justified since wake boats are likely to be heavier and more powerful in the future should design trends continue.

*For Public Users.* Recent studies have shown that the present 200-foot shoreline safety zone is inadequate to protect against shoreline erosion, shoreline structural damage, and near shore water quality and habitat degradation. These impacts result from the power of these wakes. To make the power comparable to that from waterskiing wakes at the present safety zone distance of 200 feet, predictions from recent studies indicate that wake surfing must be at least 1000 ft from shore.

**11) What is the science behind the 20 foot depth rule? ([see ANR petition pg 25-30](#))**

*For the Regulators.* Several studies ([see ANR petition Table 5 pg 25](#)) have used acoustic Doppler technology to measure the slipstream turbulence at various depths. Velocities sufficient to entrain fine sediments characteristic of many Vermont Lake bottoms have been measured at depths greater than 20 feet. Most of the vulnerable "littoral zone" of lakes is in depths less than 20 feet, so this minimum depth would also help protect this most critical lake habitat. "Bottom scouring" from wake boat activity has been observed in many shallow lakes. Imposing this depth limit would also prevent the fragmentation of milfoil and other plants by the deep-running wake boat props.

*For Public Users.* As any experienced wake surfing skipper will tell you, wake boats can stir things up when operated in shallow water. With horsepower ratings up to 600 HP and downward-directed propeller slipstreams in wake surfing mode, this is not hard to understand. Water speeds sufficient to stir up bottom sediments have been measured at depths greater than 20 feet. A 20-foot limit would also protect critical fish habitat and aid in reducing the spread of milfoil by fragmentation.

**12) What is the science behind the prohibition of ballast-enabled wake boats on small lakes? ([see ANR petition pg 35-40](#))**

To enhance the wake, wake boats use water-filled ballast tanks that can contain many thousands of pounds of water. It is impossible to guarantee that these tanks are fully empty when these boats are transported. It is also impractical to inspect or decontaminate these ballast enclosures. Even if a ballast system indicates "empty," studies have shown that gallons of water may remain. In several cases veligers (larval mussels) have been found in "empty" ballasts. Other invasive species are also small enough to be pumped into these voluminous ballasts. If a wake boat is used for wake sports and then transported to a lake too small for a Wake Sport Zone, the petition proposes to prohibit the use of this boat unless the ballast system has been disabled. This is proposed to minimize the spread of AIS that may be hidden in these chambers while allowing wake boat owners to continue to enjoy their boats for waterskiing and cruising.

*CURRENT WAKE BOATS IN VERMONT***13) If the rule proposed in the petition is adopted, how will that affect someone who owns a wake boat on a small lake with no Wake Sport Zone? ([see ANR petition pg 39](#))**

Boats with wake-enhancing tanks and devices can be easily modified to disable the wake-enhancing characteristics of the boat so that they then be used for all *other* water sports activities allowed on all lakes.

**14) If a wake boat is modified to disable its wake-enhancing characteristics, could it be transported to a lake with a Wake Sport Zone and used there for wakesurfing?**

Yes. While most "resident" boats that are moored at lakeside residences or marinas are not frequently transported from lake to lake, this would be possible. Wake boat manufacturers are aware of the problems caused by wake-enhanced sports and have cautioned wake boat purchasers and owners to minimize these problems and resulting conflicts by keeping a greater distance from other water users than otherwise required by local law when producing large wakes. The wake boat industry is fairly young, and it might be expected that marinas and boat dealers will develop effective means to address these problems. By limiting wake-enhanced water sports to Wake Sport Zones, the proposed rule allows all the normal use of Vermont public waters to be enjoyed in a reasonable manner by the greatest number of individuals in appropriate venues.