

WAKE BOATS

FACT SHEET

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A wake boat is a recreational powerboat that is used for the purpose of creating large wakes to enhance the sports of wakeboarding and wake surfing. In recent years, these boats have gained popularity on inland lakes in Michigan. Their usage has resulted in unintended negative consequences to some lake ecosystems. Boats used for wake surfing create larger waves than other recreational watercraft as they typically fill ballast tanks with water to weigh them down, displacing immense amounts of water to create a large wake. Many of these boats are also outfitted with hydraulic trim tabs that increase the steepness of the wake.

The operation of wake boats in shallow water and near shore areas has significant impacts on the lake bottom and shoreline habitat. When a wake boat is operating at wake surfing speed, approximately ten miles per hour, the boat's stern is angled down, pointing the propeller towards the lake bottom. When operating in waters shallower than 15 feet, the turbulence from the propellers can disrupt the lake bottom, resuspending sediments, uprooting aquatic plants, and displacing valuable habitat. This resuspension of sediment reduces water clarity and introduces phosphorus to the water column, increasing the chance for algae blooms.

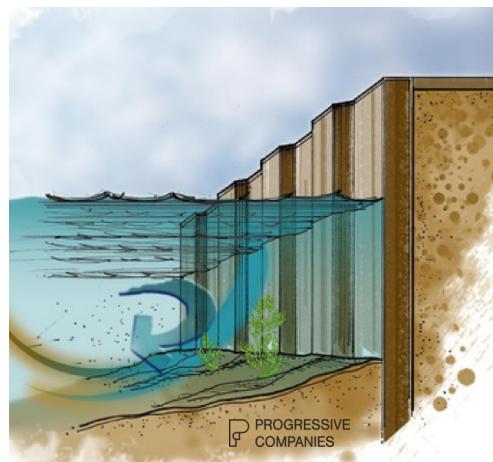
When a wake boat navigates at full-wake speed near shore or structures, the massive waves crash with more energy than any other recreational craft. The following is from a literature review done by the Michigan Department of Natural Resources (MDNR) in 2023:

"MacFarlane (2018) found that wave energy from ballasted wake-surfing craft was 5-17 times higher than a benchmark speedboat and Marr et al. (2022) found that waves produced by wake boats were 2-3 times higher, had 3-9 times more energy, and were 6-12 times more powerful than a typical motorboat." The force of these waves erodes the shoreline, uprooting plants and degrading fish habitat. Many lakefront owners have installed vertical seawalls in an attempt to slow the erosion, but in doing so, remove the transition zone from the lake to dry land. This transition zone is vital for animals like frogs and turtles.

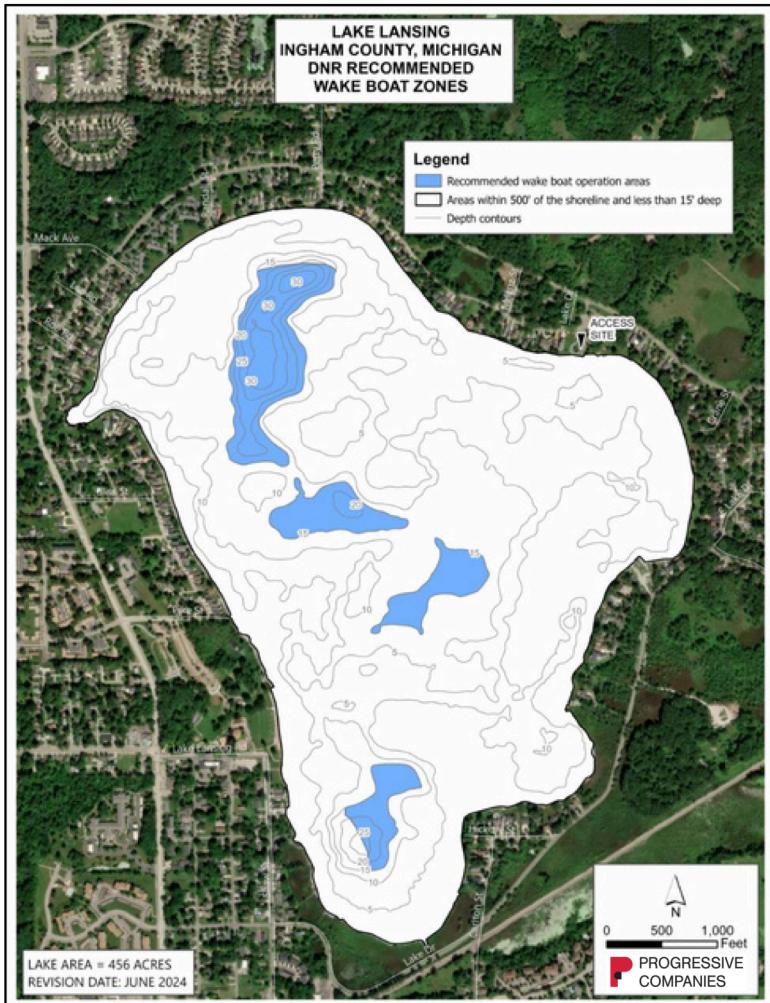
The current boating law in Michigan states, "A person shall not operate a vessel on the waters of this state at a speed greater than slow-no wake or the minimum speed necessary for the vessel to maintain forward movement within 100 feet of the shoreline where the water depth is less than 3 feet, as determined by vertical measurement, except in navigable channels not otherwise posted (NREPA 1994b)." This law was established prior to the popularization of wake boats on inland lakes. Enforcing this law falls within the jurisdiction of local law enforcement.



Steep wakes allow a surfer to ride the wake without being tethered to the boat.



Waves reflected by vertical seawalls cause scouring of nearshore sediments.



References:

Francis, J., J. Nohner, J. Bauman, and B. Gunderman 2023. A literature review of wake boat effects on aquatic habitat. Michigan Department of Natural Resources, Fisheries Report 37, Lansing

MacFarlane, G. 2018. Wave wake study: HB4099 motorboat working group. University of Tasmania, Australian Maritime College, Report 18WW01, Launceston

Marr, J.A. Riesgraf, W. Herb, M. Lueker, J. Kozarek, and K. Hill. 2022. A field study of maximum wave height, total wave energy, and maximum wave power produced by four recreational boats on a freshwater lake. University of Minnesota, St. Anthony Falls Laboratory, Project Report 600, Minneapolis

NREPA (Natural Resources and Environmental Protection Act). 1994b. Michigan Public Act 451 of 1994, part 801, Marine safety.

Riesgraf, A., J. Marr, W. Herb, M. Lueker, and J. Kozarek. 2025. A field study of recreational powerboat hydrodynamics and their impacts on the water column and lakebed. University of Minnesota, St. Anthony Falls Laboratory, Minneapolis.

The Michigan DNR has published recommendations for safe and environmentally friendly wake boat operation based on their literature review published in 2023. "The [Fisheries] Division recommends that wake boats operating in wake-surfing or wake-boarding mode do so in water that is at least 15 feet deep (MDNR 2023)." The Division also recommends "Boats operating in wake-surfing mode or wake-boarding mode, during which boat speed, wave shapers, and/or ballast are used to increase wave height, are recommended to operate at least 500 feet from docks or the shoreline, regardless of water depth (MDNR 2023)." These recommendations are not rule or law, but are meant to educate wake boat owners on how to most responsibly operate wake boats to care for Michigan's inland lakes.

The adjacent map shows a 500-foot buffer from the shoreline and areas shallower than 15 feet in white. If dock lengths were also taken into account, the area of appropriate full-wake operation shown in blue would be even smaller.

Recent research indicates that boats operating in wake surfing mode may disturb sediments in water depths up to 20 feet (University of Minnesota 2025).

