

TOWN OF WINCHESTER, VILAS COUNTY, WISCONSIN  
CONDITION REPORT FOR ORDINANCE No. 2023-9

The Town of Winchester, Vilas County has seen a recent increase in enhanced elevated wake activity on several Township lakes. Concerns have been raised by lake residents regarding the increased damage to the shorelines, effects on wildlife, safety of small boaters and increased lakebed disturbance.

Numerous studies have been conducted regarding the effects of recreational boat wakes on lakes and rivers by showing the impact they can have on shoreline erosion and sediment resuspension. Shallow lakes, shallow parts of lakes, and narrow channels connecting lakes are the most susceptible to the impacts of large lake wake activity. These examples typify the majority of lakes in the Town of Winchester.

*Lake descriptions:* The Town of Winchester, Vilas County is home to more than 60 named and unnamed bodies of water. A project was initiated in 2015 by the Town Lakes Committee to evaluate the lake morphometry, water quality and aquatic plant diversity in twelve (12) of Winchester’s most significant bodies of water. The study resulted in the Town of Winchester Lake Comprehensive Management Plan which was issued in October 2020. The lakes chosen included Harris Lake, Hiawatha Lake, Birch Lake, Tamarack Lake, Rainbow Lake, Rock Lake, North Turtle Lake, South Turtle Lake, Circle Lily Lake, Pardee Lake, Lake Adelaide and Lake Helen.

Table 1 lists key lake properties including lake type, surface area, maximum depth, mean depth, lake perimeter, trophic state, limiting nutrient, average summer total phosphorus, average summer chlorophyll-a and average summer Secchi depth.

Table 1: Winchester Lakes Summary

	Phase I 2015		Phase II 2016			Phase III 2017			Phase IV 2018			
	Harris Lake	Hiawatha Lake	Birch Lake	Tamarack Lake	Rainbow Lake	Rock Lake	North Turtle Lake	South Turtle Lake	Circle Lily Lake	Pardee Lake	Lake Adelaide	Lake Helen
<b>Morphometry</b>												
Lake Type	DHDL	DHDL	DLDL	DLDL	DLDL	SLDL	DLDL	DLDL*	DLDL	DHDL	DHDL	
Surface Area (acres)	536	38	528	63	148	126	368	488	235	213	62	
Max Depth (ft)	57	58	52	27	39	20	51	40	37	28	69	
Mean Depth (ft)	24	32	18	7	9	9	21	14	19	12	22	
Perimeter (miles)	5.8	1.4	6.5	1.7	3.5	3.9	5.6	7.7	3.9	3.5	2.0	
Shoreline Complexity	3.2	2.6	4.1	2.1	4.0	6.0	4.4	6.1	3.3	2.9	3.3	
Watershed Area (acres)	2,348	819	4,178	5,109	6,731	3,624	12,901	15,356*	5,887	2,109	229	
Watershed to Lake Area Ratio	3:1	21:1	7:1	77:1	43:1	28:1	34:1	4:1	24:1	9:1	3:1	
<b>Water Quality</b>												
Trophic State	OM	M	M	ME	ME	E	M	E	M	ME		
Limiting Nutrient	P	P	P	P	P	P	P	P	P	P		
Avg Summer TP (µg/L)	12	17	19	32	24	26	16	22	20	20		
Avg Summer Chl-a (µg/L)	2.4	4.6	5.4	5.6	10.3	11.8	5.4	8.5	6.9	10.5		
Avg Summer Secchi Depth (ft)	16.1	5.7	7.8	5.9	6.6	5.7	8.4	7.4	5.6	7.9		
Summer pH	8.1	7.2	7.7	7.3	7.5	7.6	7.6	7.7	7.7	8.4		
Alkalinity (mg/L as CaCO <sub>3</sub> )	39	15	37	32	30	31	30	36	32	45.7		

DHDL = Deep Headwater Drainage Lake	TP = Total phosphorus	OM = Oligo-mesotrophic
SLDL = Shallow Lowland Drainage Lake	Chl-a = Chlorophyll-a	M = Mesotrophic
DLDL = Deep Lowland Drainage Lake	E = Eutrophic	ME = Meso-eutrophic

These lakes are representative of the lakes found in the Town of Winchester with respect to surface area and depth. Both motorized and non-motorized boats have operated on these lakes for decades.

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Birch Lake, Harris Lake, Noseem Lake, North Turtle Lake (Rock Creek) and South Turtle Lake have Public Access Boat Landings. Papoose Lake has a boat landing, but it is located in Presque Isle. Circle Lily also has a boat landing but it is located in Manitowish Waters.

It should be noted that of the twelve (12) lakes only four (4) have areas greater than 350 acres. Seven (7) lakes also display mean depths less than 20 feet. Highly variable lake bottom depths with irregular shore lines generating numerous bays and islands are typical of Winchester lakes.

*Safety of small boaters and swimmers:* The creation of large, sustained wakes creates a safety concern for other recreational users. These include the danger of capsizing small watercraft such as fishing boats, paddleboards, canoes and kayaks, along with interference to water skiing and fishing activities. Swimmers and dock sitters are also impacted.

*Effect on wildlife:* Birds, particularly waterfowl such as loons, nest close to shorelines and are especially vulnerable to shoreline disturbances. Studies have shown that when boaters pass repeatedly too close to shorelines inhabited by birds and wildlife creating large wakes, the following impacts can occur: relocation of nesting sites, abandonment of nests and loss of young. There can also be long term impacts as many species of birds that normally would return year after year to the same nesting area are forced elsewhere. In many cases, this may be to less desirable bodies of water. Many of the lakes described in Table 1 have nesting shoreline birds including loons.

The disturbance of aquatic vegetation by wave energy and propeller propwash in shallower waters (less than 20 feet depth) can reduce vegetation or disturb lake bottoms, impacting fish habitat.

*Effect on shoreline and water quality:* Maintaining water quality is in the best interest of all property owners and the public at large relative to the use of the lakes. Not only for recreational activities such as boating, skiing, and tubing, but also for fishing and swimming. Increased sedimentation which can reduce light penetration and inhibit primary production, abrade and clog fish gills, and prevent feeding by sight feeders, will negatively alter fish populations. While shoreline erosion can be reversed with much cost and effort within years, changes to water quality by disturbance of the lake beds can be even more difficult to remedy. Disturbances of the lake bed can release nutrients such as phosphorus that took decades to accumulate. Once released and resuspended, it can take decades for a lake to return to its former status. As noted in Table 1, phosphorus is the limiting nutrient for enhanced growth of algae and its associated detrimental impacts. Recent work by Vilas County and the WDNR indicate that phosphorus levels over 20 ug/L can lead to accelerated algal blooms. Table 1 shows that we are at or approaching those levels in many area lakes.

Without adequate protections, erosion and sedimentation will accelerate lake eutrophication with a negative impact on all who use these water resources.

*Regulation of Enhanced Wakes:* After receiving many complaints and requests to limit wake enhancement activities from damaging the shoreline, endangering other boaters & recreational users and damaging lake beds, the issue was brought to the Winchester Town Lakes Committee in July 2022.

At the July 27, 2022 Winchester Town Lakes Committee Meeting, a sub-committee was formed to develop information necessary to support a request to the Town Board to create an ordinance addressing the use of wake boats and enhanced waves on Winchester Town lakes.

A presentation on Hazardous Wakes - Generation and Concerns was reviewed by the Town Lakes committee at their August 24, 2022 meeting. The information covered the environmental & safety issues as well as relevant laws and regulations. Limitations on distance from shore to allow wave amplitude and energy to dissipate and lake depth requirements to eliminate the scouring of lake

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bottoms by propwash created by bow-up boat operation were also addressed. This information was obtained from recent research carried out and reported by the States and Universities in Wisconsin, Michigan and Minnesota. The committee recommended that the issue be presented to the Town Board for consideration of regulating hazardous wakes and wake boats.

The Wake Boat information was presented to the Winchester Town Board at their October 3, 2022 Meeting. Any further action was referred to the Winchester Planning Commission.

The Winchester Town Board hosted a Public Hearing on Saturday, June 17, 2023 at 9:00 AM. The purpose of the meeting was described as follows:

1. Informational Meeting with no action taken. The meeting is to educate the public of the potential risks and impacts of wake boats and enhanced waves on our lakes.
2. Want to hear from boat owners how they would provide safe and responsible operation of these boats on area lakes.
3. These boats are not illegal or prohibited, but in their ballasted operational mode they can create a wake that can cause potential problems for boaters, kayakers, wildlife and lake problems.
4. Should the Town adopt an ordinance

The meeting had a presentation on hazardous wakes by the Winchester Town Lakes Committee to familiarize and define the topic for people in attendance. This was followed by Comments/Questions from Town Board/Planning Commission members and Comments/Questions from the Public.

Comments were received from individuals both in favor of and opposed to a Town Ordinance banning the operation of boats in enhanced wake generation mode.

The Winchester Planning Commission and the Town Lakes Committee have worked together with Wake Boat owners and Lake Residents to address an ordinance that permits ballasted wake boat operation where it is practical while protecting the lakes and property from enhanced amplitude/energy waves and downward projected propwash. This would require operation no closer than 700 feet from shoreline and in water depths over 20 feet. These restrictions limit ballasted, enhanced wake boat operation to a limited number of Town Lakes that are large enough and have deep enough runs to be practical.

The safety and welfare of those using the lakes as well as a number of lakes environmental security will be compromised if this ordinance is not adopted. This ordinance affords Winchester Town Lake users an opportunity for safe lake usage while protecting the lakes from further or enhanced degradation of water quality.

Certain individuals may be opposed to any or all forms of regulation and some residents may feel the ordinance does not result in a complete ban. For individuals who live on or recreate on Winchester Town Lakes, this will be a new regulation. Some individuals may feel the ordinance is infringing on their rights to lake usage by limiting the area of usage relative to their activities.

After reviewing all current data and public input, the Town of Winchester concluded that public safety and protection of its valued resources, Town Lakes, would be best served by the ordinance.

Signage will be placed at public boat landings within the Town of Winchester following ordinance approval.