Comments on the New Development on Woodland Lake

By David J. Jude, PhD, Limnologist, Fishery Biologist 27 December 2025

I have lived on Woodland Lake from 1976 through 1989 and was involved in water quality sampling and a drawdown that was quite effective in killing Eurasian Milfoil during this period. I have a PhD in Limnology and an MS in fishery biology and two of my colleagues and I formed a consulting company called Freshwater Physicians which is 51 years old. The company does water quality monitoring, wetlands delineations, fishery studies, and court appearances in Michigan and Wisconsin. OWL (Organization of Woodland Lake) has hired us to monitor the water quality of Woodland Lake since 2012. I am intimately aware of the area of the development having visited it while I lived on the lake and often I run the boat in that area during my water quality sampling. I am on the faculty in the School of Environment and Sustainability at the University of Michigan having retired in 2012. I worked for 40 years on fishery and water quality issues in the Great Lakes.

The area suggested for development is a 40-acre, forested area next to Woodland Lake in a sheltered, shallow cove on the northwest side. This area is one of the few, undeveloped areas left on the lake along with some extensive wetlands on the NW side. These areas that are left are critical habitats for amphibians, mammals, and birds, but are also important since they act as buffers for preventing accelerated runoff from developments that cut down trees, put in structures and roads that increase impermeability, plant lawns that are usually over fertilized and treated with poisonous herbicides and insecticides that kill birds as secondary consumers. The runoff from this development will affect Woodland Lake and the adjacent roads, especially Woodland Shore Drive. These undeveloped areas provide many ecological services if left in their native state, but once developed, they exacerbate existing water quality issues in lakes.

Woodland Lake's water quality has been declining in recent years and it will experience further decline if this project goes forward. We have been monitoring water quality for 13 years from 2012 to 2024 and provided reports to OWL to document the condition of the lake each year. Water clarity during 2017 hit a high of 14 ft during summer, while it has declined to around 5 ft during 2025. Dissolved oxygen has been zero on the bottom during almost all surveys fueling increased internal loading. Internal loading (decomposition of organic matter at the deep station during anoxic (no dissolved oxygen) conditions) has increased over time since ammonia (toxic to fish and a nutrient), one of the main products on the bottom at the deep station during summer, has been increasing from 0.20 mg/L (2014) to 1.71 mg/L in 2023, a very high concentration. In addition, total phosphorus at the deep station has also increased dramatically from 0.009 in 2017 to 0.042 mg/L in 2021, along with major conductivity (a measure of the ability of water to conduct electricity – negative ions like chlorides) increases. In addition, macrophytes have declined and have been replaced by the worst type of algae - blue-greens, which can produce toxins that can be toxic to animals and can harm humans if ingested. OWL has been trying to improve water quality conditions and has initiated programs to attempt to reduce nutrients in the lake. According to our

data, the recent costly Phoslock treatment during 2023 along with the TimberChar™ treatment in 2024 have had a mixed effect: water clarity increased an average of about 1.7 ft and 0.9 ft respectively, while TP and SRP have declined at the deep station on the bottom, with some declines (very small) occurring in TP and SRP in the north half. Lastly, the fishery in the lake has been degraded, since with the increased turbidity, visual predators like largemouth bass, northern pike, and most panfish will have increased difficulty in catching prey.

It has been difficult to completely identify all of the factors responsible for these changes and it may be a combination of increasing temperatures due to climate change, the increasing runoff of nutrients from the many drains that enter the lake and their highly impervious surfaces, nutrients from Ore Creek during major rain events, fertilizer applications from both riparians and those in drain fields around the lake, currents generated by increased boat traffic. especially wake boats, and excessive macrophyte control efforts. The inherent system in Woodland Lake, which is a dammed lake that drains a huge watershed (the lake is 309 acres; the watershed is 12,928 acres), is mostly shallow (mean depth of 7.6 ft) and hence susceptible to nutrient enrichment from boat traffic stirring up flocculent sediments that prior to damming was a large wetland in many areas. We are seeing increasing conductivity, nitrates, and phosphorus coming in from the incoming drains (Grand River, Hacker, and Ore Creek) that are correlated with increasing conductivity and nutrient concentrations throughout Woodland Lake over the past 15 years or so. High levels of impervious surfaces along with increasing population, road traffic, and rains contribute to this correlation.

At best this development should not go forward, but failing that, efforts should be made to ensure it does as little damage to the environment as possible. Let me point out some of the potential drawbacks to the project and some remedies to reduce their impact.

Michigan Shoreline Partnership provides guidance on how best to treat shoreline properties. They state that preventing erosion is the easiest and least expensive approach to maintaining a healthy shoreline. Houses should be a minimum of 100 feet from the lake, the development plans state much less. Keep as many trees, shrubs, and native plants as possible. Limit or eliminate turf grass, especially at the lake edge; plant greenbelts instead. It also deters geese from finding attractive grazing land at each house. Minimize impervious surfaces. Support the presence of aquatic plants; only remove enough to get a boat through for access or to provide a small swimming area. In addition, a USGS fact sheet (Hunt et al. 2006) on WI lakes echoes similar recommendations. These include: Maintaining a natural landscape with native vegetation to the degree possible, leave or insert buffer strips or green belts, no lawns on slopes that drain to the lake, no fertilizer use on lakeshore lawns, limiting the amount of impervious areas on the development. Lastly, the Michigan Lakes and Streams publication for January 2026 cites an article by the Wisconsin-based Last Wilderness Alliance that states that research indicates that wake boats should be operated only at 500 ft from the shoreline buffer zone, but the Alliance states it should be 500 ft plus a 200 - ft wide strip (700 ft) for other boaters, anglers, skiers, swimmers, sailors, and those in a pontoon boats to safely navigate in the nearshore zone without dealing with the

threat of dangerous waves. They propose this since the recently designed boats deliver 65% more power than the 2019 models.

The development calls for 10 new docks along the shoreline. We have been working on Michigan inland lakes as noted above for 51 years and we have seen the proliferation of more boats and other recreational craft on lakes, many of these new boats have more powerful engines, and the introduction of wake boats, which create huge currents that can have severe detrimental effects on nearshore areas if they are operated near shore or in shallow water. Woodland Lake is mostly a shallow lake with one deep basin around 35 ft west of the public launch site and the operation of these large speed boats and wake boats can be detrimental to the lake. We have done research on two Michigan inland lakes (Pine and Elizabeth- Freshwater Physicians 2020) on the impact of wake boats on water quality and reviewed all the literature we could find on their effects (one example: Maynord, S. et al. 2008). The upshot is that excessive boat traffic can destroy aquatic vegetation that acts as a deterrent to the currents generated, stirs up flocculant sediments that re - distributes nutrients into the water column fueling algal and macrophyte growth, impacts fish habitat, and erodes shorelines causing more placement of riprap and other devices which are also detrimental to fish. An actual visual count of the number of boats on Woodland Lake was made by a resident and OWL board member Douglas Taylor in 2020. He counted the boats in the water in early October which excluded jet skis, kayaks, row boats, and boats that were shrink wrapped on lifts. He counted 228 boats. Note that the count did not include riparian boats that were removed in September after children went back to school or all the boats that enter from the public launch. Hence, more boats from the development recreating on Woodland Lake will make a bad situation worse.

In addition, we are also concerned about the docks themselves, especially the two that are the north – most as noted on development plans. Those two would be located in wetlands that have formed in that northern section that are thick with sediment, have extensive wetland plant species dominated with cattails, and we would expect riparians to demand access through those docks. That will create a new set of detrimental activities that will destroy wetlands by the building of the docks, possible interest in dredging access for the boat or boats that will be docked there, and increased disturbance to thick and flocculant sediments in that area that will diminish aquatic plants and re-distribute flocculent sediments releasing nutrients to fuel excessive plant growth. That area, if this project is approved, should at least be designated as a no-wake area to reduce impacts.

Literature Cited

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