
Waupaca Chain O' Lakes

— Citizens Advisory Committee —
Presentation

Summary

- The “2022 Lake Load Capacity Study - Recreational Impacts” provides a great deal of insight into how the Chain O’Lakes are used and the impact it’s having on the safety and health of the lakes.
- The “Citizens Advisory Committee” analyzed the data and identified 10 major issues
- A description of each issue, along with the committees recommendation on how to address the issue, is included.
- The issues have been prioritized but the committee feels all of the issues are important and all need to be addressed.
- The material covers
 - Summary of the recommendations
 - Committee members
 - Committee Purpose
 - Committee Goals
 - Data evaluation method
 - Calculation of lake capacity
 - Evaluation of capacity vs data from study
 - Description of issues and recommendations
 - References

High-Level Summary of Recommendations to the Lake District (1 of 2)

- 1. Local ordinance prohibiting the use of enhanced wake capabilities.**
 - ◆ A local ordinance prohibiting the use of enhanced wakes capabilities on the Waupaca Chain O'Lakes should be written and formally approved.
- 2. Additional no wake zones**
 - ◆ A "NO WAKE" zone should be defined on south-east end of Columbia Lake. This is the area defined by the 2009 WI DNR study.
- 3. Communication, education, and training**
 - ◆ The Lake District should clearly communicate, provide education and training to the lake property owners and the local community on the all Lake District approved recommendations. See the detailed recommendation.
- 4. Definition of eco-zones**
 - ◆ The Lake District should define Eco-zones based on 2009 WI DNR defined sensitive areas.
 - ◆ Follow what other WI lake orgs have done
- 5. Enhanced law enforcement and water patrol**
 - ◆ Current water patrol is only supported only by Farmington - clarification is needed on how a new ordinance will be handled uniformly across the chain.

High-Level Summary of Recommendations to the Lake District (2 of 2)

- 6. Meet with Waupaca County Parks and Recreation on public access to the Chain.**
 - ◆ The purpose of this meeting would be to go over the data from the Lake Study and focus on public access and over utilization.
- 7. On-going study & formal documentation of lake capacity and usage**
 - ◆ There needs to be an going study to determine how to reduce over usage, provide a safer boating environment, and methods to protect environmentally sensitive areas.
 - ◆ This should align with what other WI lake orgs have done.
- 8. Impact of high water level on Waupaca Chain O'Lakes**
 - ◆ The Waupaca Chain O'Lake District should work with the DNR to develop a baseline and impact of high-water levels.
- 9. Enforcement of the number of docks & boats per lake frontage**
 - ◆ Lake property owners are contributing to the overuse of the lakes. The DNR has well defined laws that need to be enforced.
- 10. Impact of State Law 30.68(5) on Waupaca Chain O'Lakes**

Citizens Advisory Committee Members

Name	Role	Lake
Dan Johnson	Chairman	Dake
Fawn Johnson	Committee member	Dake
Rose Spaar	Committee member	Columbia
Peggy Jesion	Committee member	Sunset
William Morgan	Committee member	Sunset
Craig Klapper	Committee member	McCrossen
Carl Nelson	Committee member	McCrossen

Purpose

The purpose of the Citizens Advisory Committee is to evaluate the “2022 Lake Load Capacity Study - Recreational Impacts” and provide recommendations to the Waupaca Chain O’ Lake District Board on issues the committee determines need to be addressed.

Goal

The goal of the Citizens Advisory Committee is to provide the Waupaca Chain O' Lakes District recommendations that take into consideration all interests in the Chain O' Lakes usage. This includes:

- The variety of lake usages (fishing, canoe, kayak, sailing, power boat, tubing, water skiing, wake/wave boats, etc).
- The quality satisfaction of usage
- Boater and personal safety
- Environmental impact & long term health of the Chain O'Lakes

Lake Load Evaluation Method

- The Waupaca Chain O' Lakes District is not the 1st to do a capacity study.
 - The Citizens Advisory Board has collected information from other studies to use as guides. All references are noted and included at the end of this package.
- The basic method used by other studies is
 - Collect lake usage data
 - This is the 2022 Lake Load Capacity Study done by the Lake District
 - Determine the lake load capacity recommendations
 - This is defined on slide 6 of this package and is based off of methods and studies developed and used in WI and around the US.
 - Compare the lake usage data to the load capacity recommendations and goals for the lake
 - Define how issues should be addressed
 - This will be recommendations to the Lake District Board
 - Repeat

Calculating Lake Load Capacity Recommendations

- The following definitions for lake load capacity are based off of “Guideline for Lake Studies”¹
- Usable surface area is based off of the 2022 Lake Load Capacity Study - Recreational Impacts - page 11 - minus DNR defined critical habitat and shoreline buffers.
 - Shoreline buffers
 - 150' - 2022 Lake Load Capacity Study
 - 200' - Boating industry guideline for Enhanced Wake²
 - 500' - MI Fisheries guidelines for enhanced wake, and VT DEC Draft Rule for Wake Boat Regulation^{3,5,6}
 - 700' - Hayward, WI Local Ordinance regarding enhanced wake⁴
- Minimum acreage required for each use
 - No wake lakes = 8 acres/boat¹
 - Fast lakes mix usage (does not include enhanced wakes) = 30 acres/boat¹
 - Fast lakes mixed usage with enhanced wake = 40 acres/boat^{*}
- Formula
 - $(\text{Usable surface area}) / (\text{minimum acreage required for each use}) = \text{recreational carrying capacity}$

*more research is needed to determine what acres/boat should be used with wake enhanced boats - some studies used 30 some recommend 50.

Recreational Carrying Capacity per Lake vs Observed 2022

Compare "boat capacity" to "Average observed 2022"

Conclusion: Based on the existing guidelines the 2022 Chain O' Lakes Study indicates the majority of the no wake lakes are over utilized, and all of the fast lakes are over utilized.

No Wake Lakes	Shoreline	Total Acres	Acres <3'	150' buffer			Average observed 2022			
				buffer acres	lake acreage	boat capacity	Motorized	Paddle	Beached/Anchored	Total
Bass	1614	2.52	1.1	n/a	1.42	1	0	0	0	0
Beasley	3766	11.8	0.5	n/a	11.3	2	3	2	2	7
Dake	6456	32.06	4.9	n/a	27.16	4	3	1	1	5
George	2152	5.4	0.7	n/a	4.7	1	2	1	1	4
Lime Kiln	3766	13.7	7.1	n/a	6.6	1	7	3	2	12
McCrossen	4842	29.59	2	n/a	27.59	4	12	0	6	18
Miner	6456	35.46	2.6	n/a	32.86	5	3	1	2	6
Nessling	2152	9.27	0.1	n/a	9.17	2	4	0	0	4
Otter	5918	14.4	2.7	n/a	11.7	2	2	1	0	3
Sunset	10711	89.2	10.7	n/a	78.5	10	10	2	6	18
Taylor	5918	34.9	12.4	n/a	22.5	3	17	3	11	31
Fast Lakes										
Columbia	9899.2	80.56	0.8	25.56	54.2	2	11	5	1	17
Long	16140	103.8	0.4	40.9	62.5	3	18	2	11	31
Rainbow	10560	115.5	0	23.8	91.7	4	15	4	7	26
Round	7532	79.8	0	15.2	64.6	3	7	2	1	10

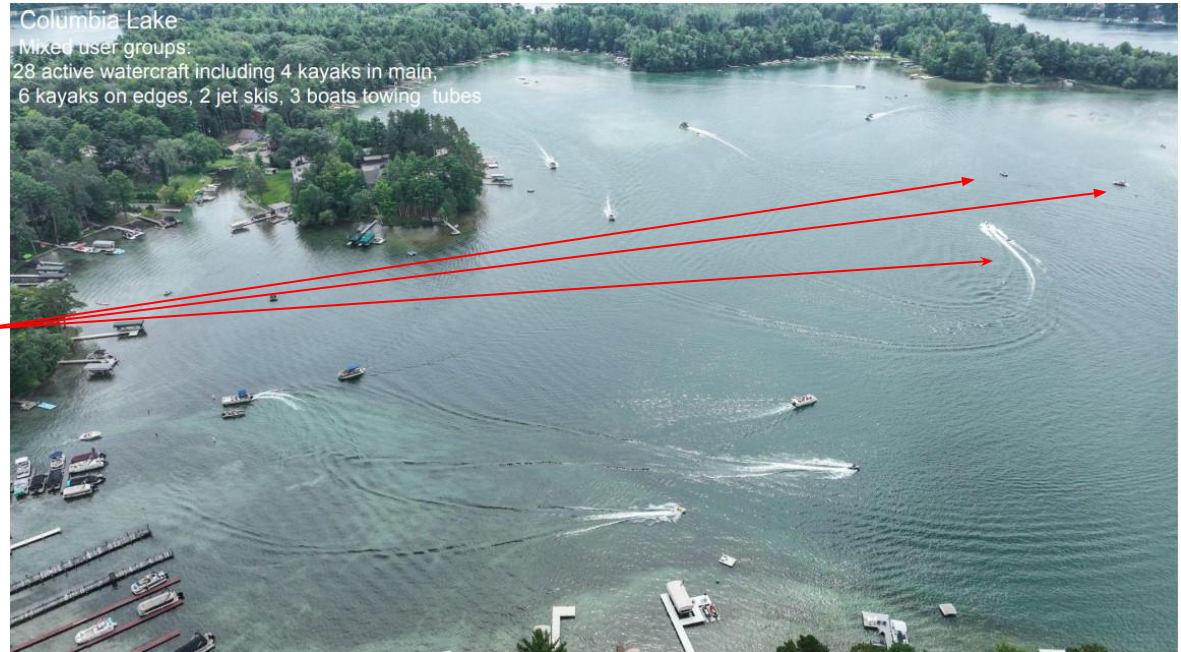
OK

Concern

Over

Example of Over Usage - Columbia Lake

- 28 water crafts - this size lake should be around 2 with a mixed usage, and for a no wake lake it would be 7.
- Note - there is at least 1 boat tubing (maybe more).
 - State law 30.68(5) states it's illegal to operate a vessel repeatedly in a circuitous manner within 200' of another vessel or person in the water.
 - Skiing and tubing has no option but to be a circuitous activity on this size of a lake, and is clearly less than 200' from other vessels.



Continued Study of Recreational Carrying Capacity - Fast Lakes

Capacity analysis for the use of enhanced wake capabilities based on

- 200' shore buffer - boating industry recommendation
- 500' shore buffer - MI, VT and other states recommendations
- 700' shore buffer - Town of Hayward, WI

Fast Lakes	Shoreline	Total Acres	Acres <3'	200' buffer			500' buffer			700' buffer		
				buffer acres	lake acreage*	boat capacity	buffer acres	lake acreage*	boat capacity	buffer acres	lake acreage*	boat capacity
Columbia	9899.2	80.56	0.8	34.07	45.69	1	85.19	-5.43	-1	119.26	-39.5	-1
Long	16140	103.8	0.4	54.52	48.88	1	136.32	-32.92	-1	190.84	-87.44	-2
Rainbow	10560	115.5	0	31.73	83.77	2	79.33	36.17	1	111.05	4.45	1
Round	7532	79.8	0	20.26	59.54	2	50.66	29.14	1	70.92	8.88	1

Conclusion: the use of wake enhanced capabilities severely reduces the number of boaters that can enjoy/use the lakes.

Recommended number of boats on the lake when enhanced wake capabilities are in use

*note the VT draft rule for wake boat usage requires 50-contiguous-acres

Visual of Fast Lake Usage Area (2 of 2)

Round Lake

Rainbow Lake

Useable acreage with
shoreline buffer of

150' Motorboat/PWC WI DNR

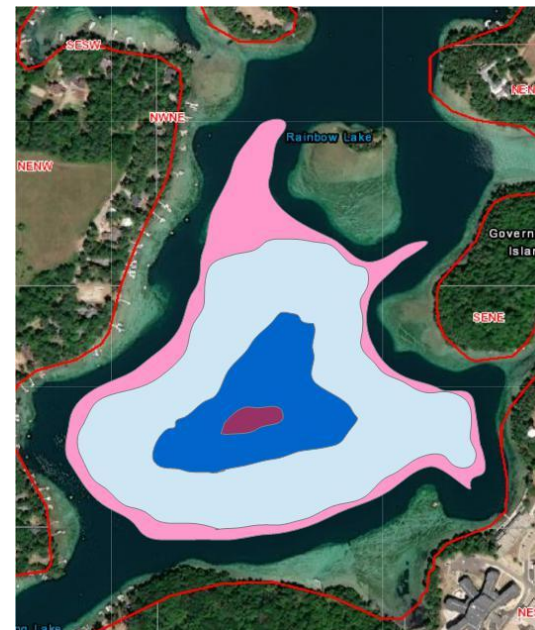
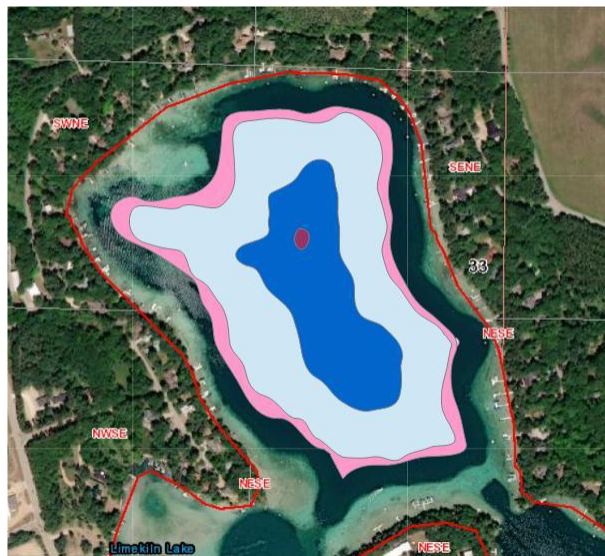
Enhanced Wake Usage

200' Boating Industry recommendation

500' MI & VT recommendation

700' Hayward, WI ordinance

Conclusion: Round & Rainbow Lakes can't support the recommendations by the MI DNR study, or the Hayward, WI ordinance.



Conclusion of Lake Load Study

- All of the the fast lakes on the Waupaca Chain O' Lakes are too small for the use of enhanced wake capabilities.
 - ◆ The precedence in the state of WI for shoreline buffer is Hayward, WI - at 700'. There are approved and enforced ordinances currently in place. The Chain O'Lakes should align with the Hayward, WI ordinance.⁴
 - ◆ With the 700' shoreline buffer (or even 500') the use of enhanced wake capabilities severely limits (or prevents) any other boat usage.
 - ◆ There should be a local ordinance prohibiting the use of wake enhanced capabilities on the Chain O' Lakes
- Ongoing studies are needed to determine how to reduce over usage and provide a safer boating environment for all boating activities.

Environmental Impacts of Recreational Use

- As noted in the 2022 Lake Load Study the WI DNR did a study of the Waupaca Chain O' Lakes in 2009. On the lower chain they identified 7 lakes to have "Critical Habitat Designation".
 - Columbia, Dake, George, Lime Kiln, Long, Miner, and Otter Lakes.
- The Lake Load Capacity Study - Recreational Impacts provided a great deal of information on the environmental impacts of these critical habitats.
 - This section will highlight the more obvious issues

Environmental Impacts - Long Lake

DNR identified critical Habitat



Prop churn in areas identified by the DNR as environmentally sensitive

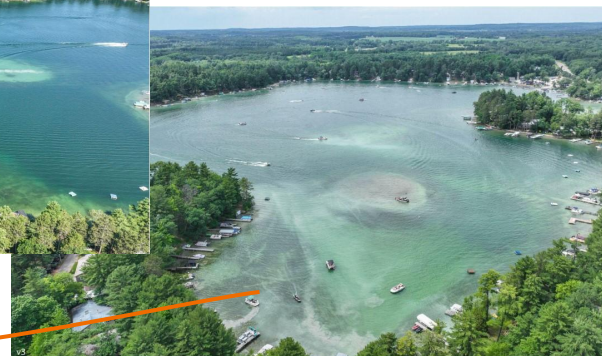
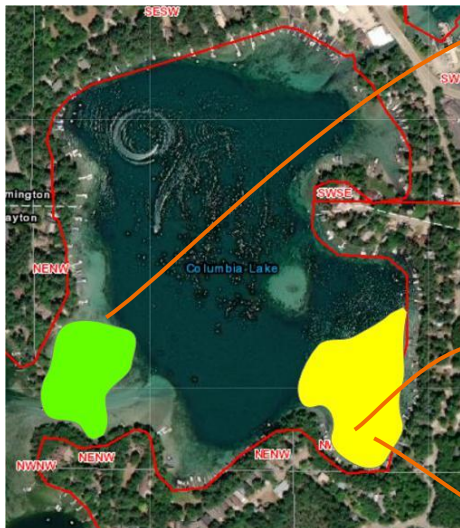
2022 Lake Study



Environmental Impacts - Columbia Lake

DNR identified critical and areas to restore habitat

Prop churn in areas identified by the DNR as environmentally sensitive



Environmental Impacts - Lime Kiln Lake

Prop churn in areas identified by the DNR as environmentally sensitive



Conclusion of Environmental Impact

- Areas defined by the WI DNR are unprotected and are being severely impacted
- A “No Wake” zone would help protect the area identified by the DNR as a sunken island on the SE corner of Columbia Lake.
- The areas defined by the DNR as sensitive areas for all of the Chain O'Lakes should be clearly marked so the public is aware.

Public Access Analysis

- Per WI DNR NR Policy 1.91- “Reasonable Public Boating Access” - for the Waupaca Chain O’Lakes the minimum car/trailer parking spots should be 22 and a maximum of 33.
- The Waupaca Chain O’Lakes has 56 car/trailer parking spots - 2.54 times the minimum and 1.7 times the maximum - defined by the DNR.
- The Waupaca Chain O’Lake 2022 Lake Load Study showed the existing car/trailer parking was never full - even during the busiest days.
- In addition to the Lake Study data there is an email discussion with the WI DNR that they would not support additional parking for the Chain O’Lakes.
- **Conclusion:** Public access to the Waupaca Chain O’Lakes exceeds the Wisconsin DNR recommendations - no additional parking should be considered.

Other items that need to be considered

The following are items the committee discussed that need to be considered

- Water levels on the Chain O'Lakes have an impact on shoreline erosion. Lake organizations around WI, and the US, monitor lake levels and impose slow no wake rules when the lake levels exceed pre-defined water levels.
- State law 30.68(5) states "it's illegal to operate a vessel repeatedly in a circuitous manner within 200' of another vessel or person in the water." Question - What impact does this have on the Chain O'Lakes? Example - Should water skiing or tubing be prohibited on Columbia Lake, and Long Lake - the reasoning being - tubing and skiing is a circuitous activity and with the current lake usage neither lake has a 200' buffer on either side of a boat.

Issue Description and Recommendations

The following section covers the 10 major issues identified by the Citizens Advisory Committee. A brief description of the issue, and a recommendation for how it should be addressed, is included.

Prohibit Enhanced Wakes Capabilities - Local Ordinance

Description: Data shows that all of the Waupaca Chain O'Lakes are too small for the use of enhanced wake capabilities. The use of enhanced wake capabilities have a server safety and environmental impact.

Recommendation: The Waupaca Chain O'Lakes District should define and seek approval from the Town of Farmington, and the Town of Dayton a local ordinance that prohibits the use of Wake Enhanced Capabilities on the Waupaca Chain O'Lakes.

- The ordinance should reference and be modeled after ordinances written by the Town of Hayward, and Long Lake in Manitowoc, WI. Items that should be included are:
 - The shoreline buffer used is 700' (as per the Town of Hayward, WI).
 - Prohibit the use of enhanced wake capabilities by use of ballast or fins
 - Prohibit waves in excess of 50' in length and 24" in height
 - Prohibit discharge of ballasts on the chain
- The ordinance must be enforceable by the local water patrol.
- The ordinance should focus on wake enhanced capabilities not on a specific type of boat.
- Once the ordinance is in place there needs to be communication, education, and training - see that recommendation.

Additional No-wake Zones

Description: The DNR has identified the sunken island in the southeastern portion of Columbia Lake as environmentally sensitive. It is not currently designated as a slow, no wake area. Boat wakes scour and disrupt the bottom sediments of a lake and are most destructive in shallow and narrow waterways as the wake is not able to dissipate over distance. In addition, Snug Harbor on Columbia Lake has a public boat landing contributing to increased boat traffic. The current slow, no wake area begins after entering the harbor where there are many docks, rafts, and swimmers in a condensed area.

Recommendation:

- Create a slow, no wake area around the sunken island commensurate with decreasing the damage to the environmentally sensitive area.
- Increase the slow, no wake area in Snug Harbor to at least the northwest corner of the point at the mouth of the harbor to lessen the adverse effect on the shoreline and creating more safety for swimmers and residents in this narrow waterway.

Communication, Education & Training

Description: The Lake District should clearly communicate, provide education and training to the lake property owners, water law enforcement, county agencies, town boards, and the local community on all approved recommendations.

Recommendation: The following are a few of the suggestions the committee has for the Waupaca Chain O'Lakes District to communicate, educate, and train

- Face to face training must be provided for Law Enforcement for any new ordinances, new "No Wake Zones", and Eco-Zones.
- The Lake District should work with the Waupaca Chain O'Lake Association on educating lake property owners on any new ordinances, new "No Wake Zones", and Eco-Zones.
- The Lake District should provide 2 presentations at the Winchester Academy on all activities it has going on - this is to help educate the community.
- The Lake District should support a presentation at the Chain O'Lakes Association members meeting on all activities it has going on - this it help educate the community.
- The Lake District should have a face to face meeting with Waupaca Parks and Rec on parking on the chain, and on all activities the LD has going on.
- The Lake District should have face to face meetings with the Town of Farmington board, and the Town of Dayton board on all activities the LD has going on.
- The Lake District should support a yearly newsletter to all property owners in the Lake District. The newsletter should be distributed by paper, email, and on the Lake District website.
- The Lake District should have regular meetings with the Waupaca Chamber of Commerce on the issues the LD is addressing and the impact it may have on the Chamber of Commerce advertising.

Definition of Eco Zones

Description: Each ecozone is distinguished from others by its unique mosaic of plants, wildlife, climate, landforms, and human activities. The Wisconsin DNR has called out specific “critical habitat areas” on the Chain in a study done in 2009 and posted on the Lake District website. “Sensitive areas are areas of aquatic vegetation identified by the department as offering critical or unique fish and wildlife habitat, including seasonal or lifestage requirements, or offering water quality erosion control benefits to the body of water.

Recommendation: The Lakes District should work with the DNR to install No Entrance buoys to all areas on all lakes discussed in the 2009 DNR study.

The WI DNR surface water grant program provides cost-sharing grants for surface water protection and restoration. Funding is available for **education, ecological assessments**, planning, implementation, and aquatic invasive species prevention and control. The Lake District should consider applying for funding for educational material to raise awareness to these areas.

Law Enforcement/Water Patrol

Description: The understanding of the Citizens Advisory Committee is that support and guidance of law enforcement/water patrol for the Chain O'Lakes is currently only handled by the Town of Farmington. With the recommendations outlined in this package there needs to be a uniform and long term approach for law enforcement.

Recommendation:

- The Waupaca Chain O'Lakes District should work with the Town Farmington and the Town of Dayton on a uniform and long term approach for supporting Law Enforcement/Water Patrol on the Chain O'Lakes.
- The Waupaca Chain O'Lakes District should consider funding a position within the sheriff's department. The position should report to the Lake District and support the Waupaca Chain O' Lakes water patrol.

Meeting with Waupaca Parks & Recreation on Public Access

Description: The “2022 Lake Load Capacity Study - Recreational Impacts”, and the data on slide 18 of this package, clearly define the current situation with parking and public access to the Waupaca Chain O’Lakes.

Recommendation: The recommendation is for the Waupaca Chain O’Lake District have a formal, documented, meeting with the Waupaca Parks & Recreation committee to go over this data.

- The goal of the meeting is to educate the Parks & Recreation committee on the parking situation, and to permanently stop any future discussion on additional parking for the chain.

On-going Study & Formal Documentation of Lake Capacity & Usage

Description: The “2022 Lake Load Capacity Study - Recreational Impacts” provided great insight into the Chain O’Lakes usage, but it was just a snapshot in time. Lake load capacity data needs to be collected on a yearly basis to clearly understand trends, long term impacts, and ongoing adjustments for how to meet the goals defined on slide 4 of this package. Many lake organizations collect yearly data on lake usage and provide annual reports and recommendations.

Recommendation: The Waupaca Chain O’Lakes District should collect yearly lake usage data to understand boating trends, long term environmental impacts. The data should be used to support the goals of the Lake District, and those defined on slide 4 of this package.

Impact of High Water on Waupaca Chain O'Lakes

Description: Water levels on the Chain O'Lakes have an impact on shoreline erosion. Lake organizations around WI, and the US, monitor lake levels and impose slow no wake rules when the lake levels exceed pre-defined water levels. In-addition - the Wisconsin DNR provides a draft ordinance on slow no wake during periods of high water levels.

Recommendation: The Waupaca Chain O'Lakes District should work with the WI DNR to develop a baseline for the water levels of the Waupaca Chain O'Lakes. The baseline should be used to determine if a local ordinance should be pursued for the Waupaca Chain O'Lakes to help prevent shoreline erosion during high-water levels.

Enforcement of the number of docks & boats per lake frontage

Description: The laws says “For new piers,* the number of boat slips, berths, mooring spaces, etc. allowed on your property is determined by the amount of shoreline owned. The law states that for non-commercial properties or properties with less than three dwelling units, up to two boat slips are allowed for the first 50 feet of shoreline owned and one for each additional full 50 feet of shoreline owned. For non-commercial properties you can also place two personal watercraft for the first 50 feet of shoreline owned and one personal watercraft for each additional 50 feet of shoreline owned. You can place this number without a permit. See Wis State Leg Chpt NR 326 for commercial property information. *Existing piers placed before April 17, 2012 are able to keep existing boat slip usage.

Recommendation: When the LD conducts its yearly lake use data (per slide 25), notation should be made of violations of the above law. Given any specific property may have temporary “extra” boats on a given day, violations should be noticed more than just once before giving information to the DNR.

Impact of State Law 30.68(5)

Description: State law 30.68(5) states “it’s illegal to operate a vessel repeatedly in a circuitous manner within 200’ of another vessel or person in the water.” Given that tubing and water skiing are circuitous activities, and Lakes such as Columbia, and Long do not have have a 200’ buffer on either side of a boat (e.g. 400’ around a boat) should these activities be prohibited on these lakes?

Recommendation: The Waupaca Chain O’Lakes District should work with representatives from the townships of Farmington and Dayton, the WI DNR, and the Waupaca Sheriff’s department, to determine if water skiing and/or tubing on fast lakes complies with WI Stats 30.68(5)

References

- 1) "Recreational Carrying Capacity in Lakes:How much is too much?", Sheela Doshi, 2006 - <https://clp.indiana.edu/doc/water-column/06summer.pdf>
- 2) "Wake Responsibly", Water Sports Industry Association
<https://www.wakeresponsibly.com/>
<https://www.wsia.net/wake-responsibly/>
- 3) MI-DNR-Report 37 - "Wake boats: concerns and recommendations related to natural resource management in Michigan", James Francis, Joel Nohner, John Bauman, Brian Gunderman
<https://michiganwaterfrontalliance.com/wp-content/uploads/2022/09/MI-DNR-REPORT-37.pdf>
- 4) Town of Hayward, Sawyer County Motorboat Wake Protection Ordinance.
<https://townofhayward.com/wp-content/uploads/2021/07/07-2021-Motorboat-Wake-Ord.pdf>
- 5) Final Report - Environmental Threat Analysis - Analyzing Threats to Water Quality from Motorized Recreation on Payette Lake, Idaho.
<https://img1.wsimg.com/blobby/go/85358067-828e-4c41-ad0f-54d479c3e5fb/Final%20Report-%20Environmental%20Threat%20Analysis%20.pdf>
- 6) Vermont DEC Releases Draft Rule for Wake Boat Regulation
<https://anr.vermont.gov/content/vermont-dec-releases-draft-rule-wake-boat-regulation>