

COMPREHENSIVE LAKE MANAGEMENT PLAN

Long Lake and Bass Lake

Lincoln County, Wisconsin

Prepared by:

Long and Bass Lake Association, Inc.

February 2026

DRAFT FOR REVIEW

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Grant Application Cross-Reference Guide

For grant reviewers: The following table maps key DNR Surface Water Grant scoring criteria and Appendix B management planning data requirements to the specific sections where each is addressed in this plan.

Project Impact and Problem Identification

- Water quality trends and impairment status — Section 4
- WisCALM assessments (TP and chlorophyll-a) — Section 4.6
- Shoreland habitat assessment (WDNR Lakeshore Habitat Protocol and Score My Shore) and development trends — Section 7.4
- Riparian land ownership analysis — Section 7.5
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Planning Efforts (Watershed, In-Water, Shoreland)

- Watershed analysis and land cover — Section 8
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- Lake physical characteristics and hydrology — Section 3, Section 8.3
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Connection to Implementation

- Alternatives analysis and decision-making framework — Section 11
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Likelihood of Success

- Organizational capacity, governance, and track record — Section 16
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- Volunteer contributions — Section 16.5
- Partnerships and collaboration — Section 16.7
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1. EXECUTIVE SUMMARY

Long Lake and Bass Lake are connected glacial seepage lakes totaling approximately 225 acres in Lincoln County, Wisconsin. This Lake Management Plan establishes a framework for protecting and enhancing the water quality, habitat, and recreational value of these lakes for current and future generations.

Why This Plan Matters

These lakes benefit from one of the most comprehensive long-term monitoring records in northern Wisconsin with over 50 years of continuous water quality data. This exceptional dataset reveals both good news and cause for concern:

- Long Lake has maintained stable water clarity over five decades, demonstrating that careful stewardship works
- Bass Lake shows a statistically significant decline in late-summer water clarity ($p=0.010$), with phosphorus levels increasing
- Both lakes are near the Wisconsin phosphorus criterion of 15 $\mu\text{g/L}$

The trends are gradual (not yet visible to casual observation) but statistically significant. This creates an opportunity for proactive management: addressing nutrient sources now, before degradation becomes severe and expensive to reverse.

Key Goals

- Protect water quality through watershed management and runoff prevention
- Prevent introduction of aquatic invasive species
- Maintain and enhance fish and wildlife habitat
- Address emerging threats including wake boat impacts and road runoff
- Preserve the pristine character of the lakes for future generations

Priority Actions

- Implement Clean Boats, Clean Waters watercraft inspection program
- Partner with Lincoln County and Town of Harrison culvert and road runoff improvements
- Install Healthy Lakes shoreline practices on willing properties
- Continue and expand volunteer water quality monitoring
- Evaluate potential wake boat impacts and explore continued protective measures

2. INTRODUCTION AND PURPOSE

2.1 Background

Long Lake and Bass Lake are connected glacial lakes located in the Town of Harrison (Gleason), Lincoln County, Wisconsin. The Long and Bass Lake Association was formed in 1985 and incorporated as a qualified lake association in 2025. The Association currently has over 200 members united by a shared commitment to protecting these lakes for future generations.

2.2 Purpose of This Plan

This Comprehensive Lake Management Plan serves to:

- Document current conditions of the lakes and their watershed
- Identify threats to water quality and ecological health
- Establish community-driven goals and priorities
- Provide a road map for protection and enhancement actions
- Support applications for Wisconsin DNR Surface Water Grants
- Guide the Association's activities for the next 10 years

2.3 Regulatory Framework

This plan is designed to meet requirements for Wisconsin DNR approval under:

- Chapter NR 193, Wisconsin Administrative Code (Surface Water Grants)
- Wisconsin Statutes Chapter 33 (Public Inland Waters)
- Wisconsin Statutes Chapter 281 (Water Quality)

2.4 Related Management Plans

This plan builds upon and complements several existing planning documents relevant to the Long and Bass Lakes watershed:

Long and Bass Lake Planning Grant (1995). The Association received a DNR Surface Water Planning Grant in 1995 that produced the first formal lake management plan. That plan established baseline conditions and initial management priorities, many of which remain relevant today. The current plan updates and substantially expands upon that earlier effort with decades of additional monitoring data and refined management strategies.

Long/Bass Lake Feasibility Study (2001). A DNR-funded feasibility study examined specific management options for the lakes, including fish propagation actions. The study informed subsequent stocking decisions and habitat management approaches documented in Section 6 of this plan.

Lincoln County Land and Water Resource Management Plan. Lincoln County maintains a comprehensive Land and Water Resource Management Plan as required under Chapter 92, Wisconsin Statutes. That plan establishes county-wide priorities for soil and water conservation, including lake protection, nonpoint source pollution control, and shoreland management. The county plan identifies lakes as priority resources and supports local lake associations in pursuing protection measures. This lake management plan aligns with Lincoln County’s goals for water resource protection and identifies specific partnership opportunities with the Land Services Department.

Prairie River Watershed Plan (HUC-10: 0704000306). Long and Bass Lakes are located within the Prairie River Watershed. The DNR’s watershed management framework establishes water quality goals and nonpoint source pollution rankings at the watershed scale. The Prairie River Watershed is ranked “Medium” for runoff impacts on lakes, supporting the need for proactive management of nutrient loading within the Long and Bass Lakes sub-watershed even though the overall watershed ranking is “Low.”

Long/Bass Lake Sensitive Area Survey (2002). This DNR-commissioned survey identified 10 sensitive areas across both lakes and designated the entire body of water as sensitive to development and habitat loss. The survey’s findings remain a foundational reference for shoreland management decisions and are discussed in detail in Section 7.

3. LAKE AND WATERSHED DESCRIPTION

3.1 Location

- Township: T34N, R8E, Sections 15, 16, 22
- Location: Town of Harrison, Lincoln County, Wisconsin
- Nearest Community: Gleason, WI

3.2 Long Lake Physical Characteristics

Characteristic	Value
WBIC	1001000
Surface Area	119 acres
Maximum Depth	64 feet
Total Shoreline	5 miles
Lake Type	Deep Seepage (groundwater-fed, no inlet/outlet)
Natural Community	Deep Seepage
General Condition	Excellent (DNR 2025 assessment)
Water Clarity	Very clear (historical Secchi: 20 ft)
Public Access	1 concrete boat landing (Lincoln County)

DNR Impairment Status: Listed as impaired (2012) for mercury in fish tissue. This is due to statewide atmospheric mercury deposition, not local pollution sources. A fish consumption advisory is in effect. Phosphorus and chlorophyll evaluations from 2012-2022 indicate a healthy system.

1982 Historical Description (DNR Surface Water Inventory):

"A very soft water seepage lake having acid, clear water of high transparency. The shoreline is entirely upland consisting of 80 percent hardwoods and 20 percent hemlock. The littoral zone is 65 percent sand, 20 percent silt and 15 percent gravel. Submergent and floating vegetation are sparse over about 20 percent of the lake basin."

3.3 Bass Lake Physical Characteristics

Characteristic	Value
WBIC	969600
Surface Area	106 acres
Maximum Depth	40 feet
Total Shoreline	2.5 miles
Lake Type	Deep Seepage (groundwater-fed, no inlet/outlet)
Natural Community	Deep Seepage
General Condition	Excellent (DNR 2025 assessment)
Water Clarity	Moderately clear (historical Secchi: 17 ft)
Public Access	Via Long Lake (channel connection)

DNR Impairment Status: Listed as impaired (2010) for mercury in fish tissue. This is due to statewide atmospheric mercury deposition, not local pollution sources. Phosphorus and algae evaluations from 2012-2022 indicate a healthy system.

1982 Historical Description (DNR Surface Water Inventory):

"A very soft water seepage lake having slightly acid, clear water of high transparency. The shoreline is upland consisting primarily of hardwoods. The littoral zone consists of 65 percent sand, 20 percent silt, 14 percent gravel, and 1 percent rubble."

Substrate Composition (Both Lakes):

Substrate	Long Lake	Bass Lake
Sand	65%	65%
Silt/Muck	20%	20%
Gravel	15%	14%
Rubble	0%	1%

3.4 Combined Lake System

Characteristic	Value
Total Surface Area	225 acres
Total Shoreline	7.5 miles
Total Lakefront Properties	216
Long Lake Properties	163
Bass Lake Properties	53

3.5 Connecting Channel

Long Lake and Bass Lake are connected by a navigable channel approximately 1.5 feet deep and one boat width wide. The channel is suitable for small watercraft but challenging for pontoons and larger boats.

4. WATER QUALITY ASSESSMENT

4.1 Monitoring History

Long Lake and Bass Lake benefit from one of the most comprehensive long-term water quality monitoring records among lakes of their size in northern Wisconsin. Volunteer monitors have collected data through the Wisconsin Citizen Lake Monitoring Network (CLMN) for over five decades.

Lake	Station ID	WBIC	Earliest Data	Latest Data
Long Lake	353122	1001000	1973	2025
Bass Lake	353077	969600	1979	2025

Current Volunteer Monitor: Mark Smallish serves as the primary CLMN volunteer monitor for both lakes.

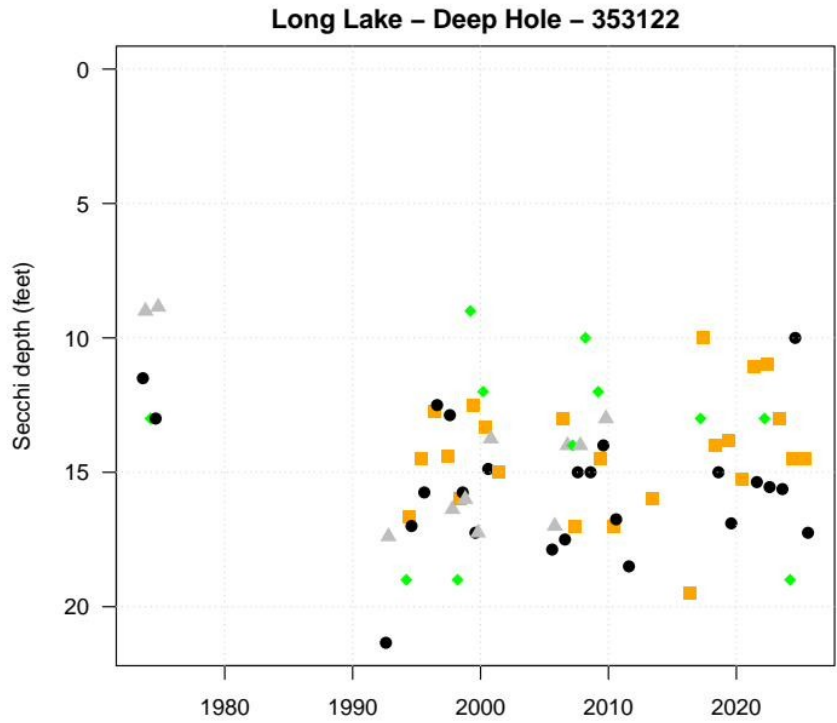
4.2 Water Clarity Trends

Long Lake: Water clarity has remained STABLE over the 52-year monitoring record. No statistically significant trends were detected.

Bass Lake: Shows a STATISTICALLY SIGNIFICANT DECLINE in late-summer water clarity ($p = 0.010$). At -0.09 feet per year, clarity has decreased approximately 2.9 feet over 32 years.

Figure 4.2a: Long Lake Water Clarity Trends (1973-2025)

No statistically significant trends detected. Water clarity has remained stable over 52 years of monitoring.



◆ spring (Jan 01 – May 14)
■ early summer (May 15 – Jul 14)
● late summer (Jul 15 – Sep 14)
▲ fall (Sep 15 – Dec 31)
 solid lines appear if there is a trend over time
 points represent seasonal averages

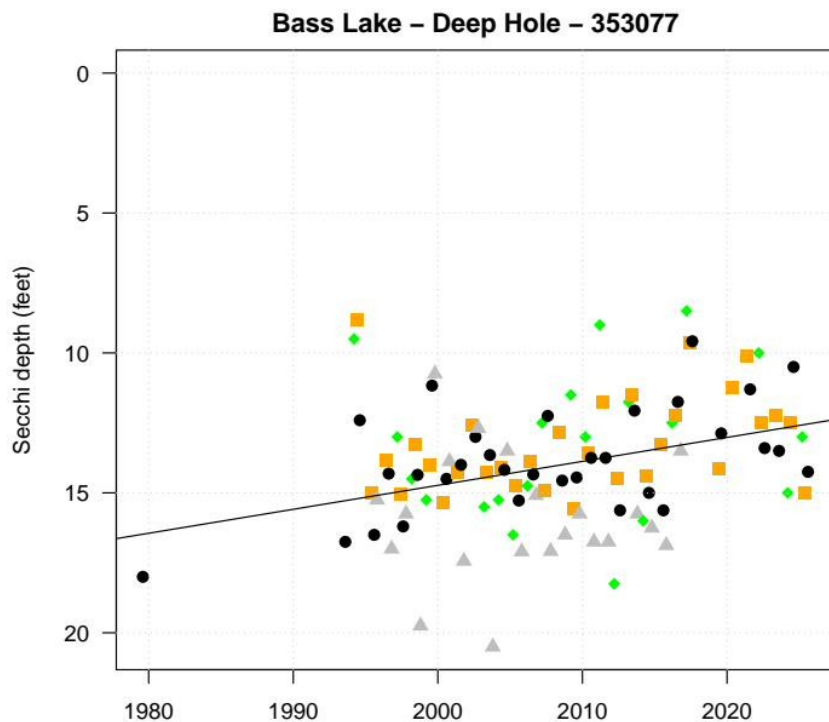
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## Use 'xfun::attr2()' instead.
## See help("Deprecated")
  
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season	no. years	no. results	slope low ci	slope estimate	slope upper ci	intercept	p-value
spring	12	12	-0.167	0.014	0.214	-14.882	0.675
early_summer	23	41	-0.135	-0.042	0.062	98.250	0.474
late_summer	24	53	-0.069	0.032	0.103	-47.909	0.551
fall	11	17	-0.273	-0.030	0.177	73.732	0.815

Figure 4.2b: Bass Lake Water Clarity Trends (1979-2025)

Late summer shows statistically significant declining trend ($p=0.010$). Solid trend line indicates significant change.



◆ spring (Jan 01 – May 14)
■ early summer (May 15 – Jul 14)
● late summer (Jul 15 – Sep 14)
▲ fall (Sep 15 – Dec 31)
 solid lines appear if there is a trend over time
 points represent seasonal averages

```

## Warning: 'xfun::attr()' is deprecated.
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## See help("Deprecated")
  
```

season	no. years	no. results	slope low ci	slope estimate	slope upper ci	intercept	p-value
spring	20	25	-0.250	-0.063	0.114	140.587	0.474
early_summer	31	133	-0.125	-0.073	0.000	160.340	0.057
late_summer	32	152	-0.148	-0.086	-0.026	185.972	0.010
fall	21	53	-0.136	0.000	0.169	16.250	1.000

4.3 Phosphorus Trends

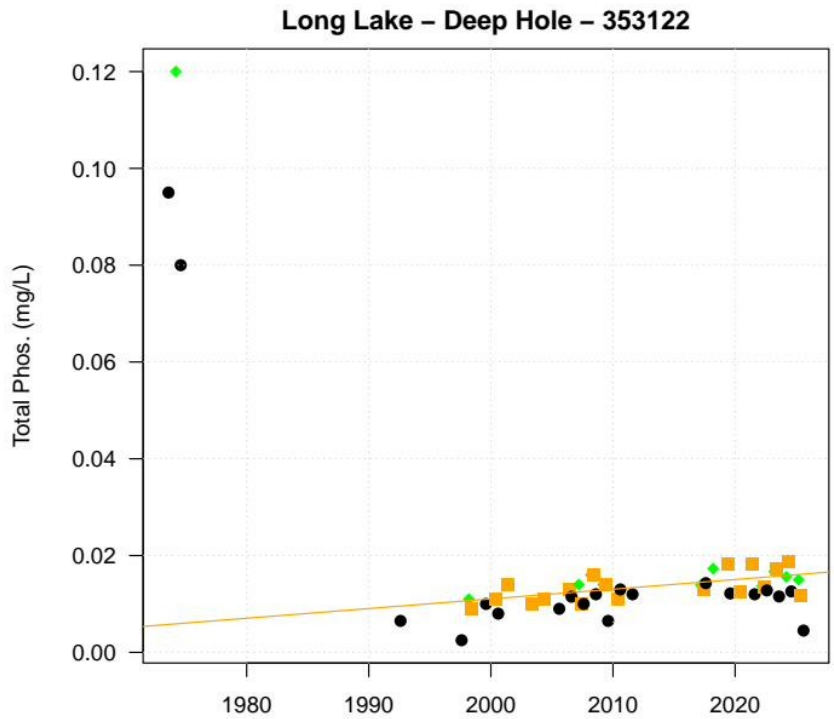
Both lakes show increasing phosphorus trends:

- Long Lake: Significant increase in early summer phosphorus ($p = 0.013$)
- Bass Lake: Significant increases in both early and late summer ($p = 0.003$ and $p = 0.0005$)

Wisconsin phosphorus criterion: 15 $\mu\text{g/L}$. Both lakes are currently near this threshold.

Figure 4.3a: Long Lake Total Phosphorus Trends (1973-2025)

Early summer shows increasing trend ($p=0.013$). Late summer remains relatively stable.



◆ spring (Jan 01 – May 14)
■ early summer (May 15 – Jul 14)
● late summer (Jul 15 – Sep 14)
 solid lines appear if there is a trend over time
 points represent seasonal averages

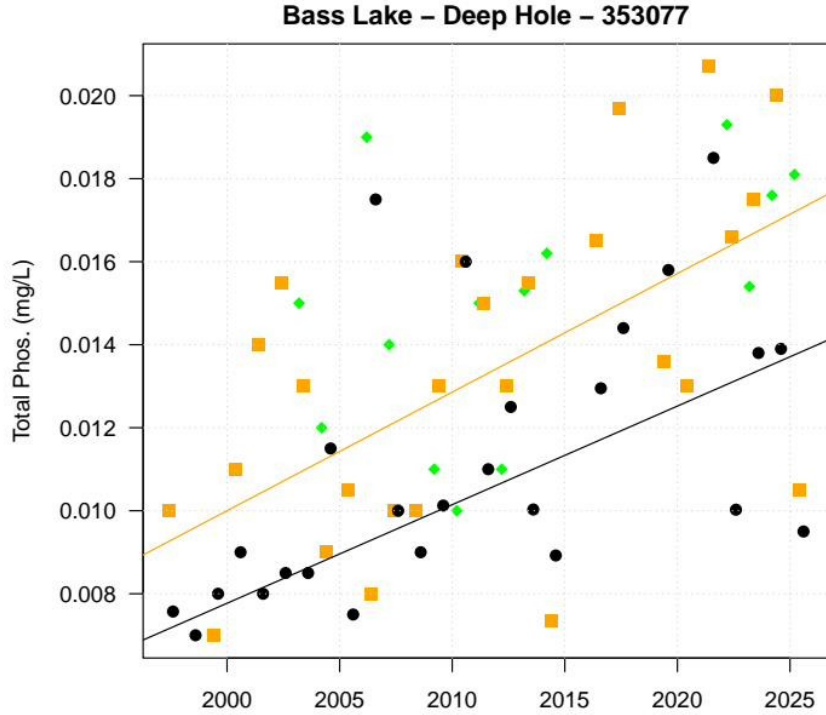
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## Warning: 'xfun::attr()' is deprecated.
## Use 'xfun::attr2()' instead.
## See help("Deprecated")
  
```

season	no. years	no. results	slope low ci	slope estimate	slope upper ci	intercept	p-value
spring	11	12	-0.00061	0e+00	0.00019	0.01500	1.00000
early_summer	18	19	0.00005	2e-04	0.00035	-0.38895	0.01343
late_summer	20	39	-0.00022	6e-05	0.00021	-0.11445	0.47405

Figure 4.3b: Bass Lake Total Phosphorus Trends (1997-2025)

Both early summer ($p=0.003$) and late summer ($p=0.0005$) show statistically significant increasing trends.



◆ spring (Jan 01 – May 14)
■ early summer (May 15 – Jul 14)
● late summer (Jul 15 – Sep 14)
 solid lines appear if there is a trend over time
 points represent seasonal averages

```
## Warning: 'xfun::attr()' is deprecated.
## Use 'xfun::attr2()' instead.
## See help("Deprecated")
```

season	no. years	no. results	slope low ci	slope estimate	slope upper ci	intercept	p-value
spring	14	14	-0.00002	0.00022	0.00042	-0.42067	0.06191
early_summer	26	30	0.00010	0.00029	0.00045	-0.56143	0.00304
late_summer	26	58	0.00011	0.00024	0.00034	-0.46723	0.00053

4.4 Thermal Stratification and Dissolved Oxygen

Both Long Lake and Bass Lake develop thermal stratification during summer months, with distinct warm surface layers (epilimnion) and cold bottom layers (hypolimnion) separated by a thermocline zone of rapid temperature change. Volunteer monitor Mark Smallish collected temperature profiles at 3-foot depth intervals during four 2025 monitoring events (April 30, June 28, July 30, and August 28), providing detailed documentation of seasonal stratification patterns.

Spring Conditions (April 30): Both lakes showed nearly uniform temperatures from surface to bottom (Long Lake: 49.5°F at 3 feet to 41.7°F at 45 feet; Bass Lake: 50.0°F at 3 feet to 41.9°F at 40 feet), indicating spring turnover was underway. Complete mixing during turnover distributes oxygen and nutrients throughout the water column, resetting conditions for the growing season.

Summer Stratification (June–August): Strong thermal stratification develops by late June. By July 30, surface temperatures reached 79°F in both lakes while bottom waters remained cold (Long Lake: 40.8°F at 45 feet; Bass Lake: 43.7°F at 45 feet). The thermocline — the zone of most rapid temperature change — establishes between approximately 12 and 24 feet in both lakes. Within this zone, temperatures drop from the upper 70s to the mid-40s, a decline of more than 30°F over roughly 12 feet of depth.

Thermal Layer Summary: The epilimnion (warm, well-mixed surface layer) extends from the surface to approximately 12 feet. The metalimnion (thermocline) occupies the 12–24 foot depth range. The hypolimnion (cold bottom layer) lies below 24 feet, where temperatures remain consistently below 45°F year-round. Long Lake’s greater maximum depth (64 feet vs. 40 feet for Bass Lake) provides a substantially larger volume of cold hypolimnetic water, which represents more extensive thermal refuge for coldwater and coolwater fish species.

Dissolved Oxygen: Dissolved oxygen (DO) data are limited. The strong thermal stratification documented in these profiles suggests that hypolimnetic oxygen depletion is likely during late summer, which is typical for stratified lakes of this depth and productivity. If the hypolimnion becomes anoxic (depleted of dissolved oxygen), phosphorus bound in bottom sediments can be released back into the water column — a process known as internal loading. Comprehensive dissolved oxygen profiling is recommended as part of the monitoring program (see Section 14) to determine whether internal phosphorus loading is occurring and contributing to the increasing phosphorus trends documented in Section 4.3.

Fall Turnover: As surface waters cool in autumn, the temperature difference between layers diminishes until the lake mixes completely (fall turnover). The August 28 profiles already show a deepening epilimnion and weakening thermocline compared to July, indicating the progression toward fall turnover. Complete fall mixing redistributes oxygen

to deep water and nutrients to the surface, influencing water quality conditions entering winter.

4.5 Water Chemistry

Comprehensive management planning requires baseline water chemistry data beyond the core trophic indicators already presented. Volunteer monitor Mark Smallish collects water samples as part of the CLMN “Secchi & Chem” monitoring protocol, packing samples in ice for shipment to the Wisconsin State Laboratory of Hygiene. These laboratory analyses produce the total phosphorus and chlorophyll-a data presented in Sections 4.3 and the Appendix A trophic trend reports — a valuable dataset spanning decades. The DNR’s Appendix B planning data requirements also specify conductivity, pH, alkalinity, total Kjeldahl nitrogen (TKN), and nitrate+nitrite (NO₂+NO₃) as additional baseline parameters. The following summarizes what is known about these additional parameters and identifies remaining data gaps.

Conductivity and Alkalinity: Both lakes are characterized as “very soft water” in the 1982 DNR Surface Water Inventory. Soft water indicates low conductivity and low alkalinity, which is typical of deep seepage lakes in northern Wisconsin that receive water primarily from precipitation and shallow groundwater rather than from streams carrying dissolved minerals. Low-alkalinity lakes have limited acid-neutralizing capacity and may be more sensitive to acidic deposition. Specific conductivity and alkalinity values have not been collected through the CLMN monitoring program.

pH: The 1982 inventory describes Long Lake water as “acid” and Bass Lake water as “slightly acid,” indicating pH values below 7.0. Acidic conditions are common in soft-water seepage lakes of this region and reflect the limited buffering capacity of the surrounding sandy glacial soils. Low pH can influence nutrient cycling, metal solubility (including aluminum and mercury mobilization), and the composition of aquatic plant and invertebrate communities. Current pH measurements are not included in the routine CLMN monitoring protocol.

Nitrogen (TKN and NO₂+NO₃): Nitrogen data are not available for either lake. In seepage lakes with forested watersheds and no agricultural inputs, nitrogen concentrations are typically low. However, nitrogen data would help characterize whether these lakes are phosphorus-limited (as expected) or co-limited by nitrogen and phosphorus, which influences how the lakes respond to nutrient loading. The nitrogen-to-phosphorus ratio also affects algal community composition, with low ratios potentially favoring cyanobacteria (blue-green algae) blooms.

Data Gap and Recommendation: Quantitative measurements of conductivity, pH, alkalinity, TKN, and NO₂+NO₃ represent a data gap in the current monitoring record. These parameters require laboratory analysis beyond the standard CLMN volunteer protocol that currently provides the core trophic data (Secchi depth, total phosphorus, and chlorophyll-a). The Association will request any available historical chemistry data

from the SWIMS database through the assigned DNR Lakes Biologist, and will explore options for adding periodic chemistry sampling to the monitoring program, either through expanded CLMN protocols, coordination with Lincoln County Land Services, or as a component of a future grant-funded study. Baseline chemistry characterization would strengthen future management decisions, particularly regarding internal phosphorus loading potential and sensitivity to changing atmospheric deposition patterns.

4.6 Impairment Status and WisCALM Assessments

The Wisconsin Consolidated Assessment and Listing Methodology (WisCALM) is the DNR's formal process for evaluating whether lakes meet water quality standards under the federal Clean Water Act. WisCALM assessments determine whether a waterbody is "healthy" or should be listed as impaired on the state's 303(d) list. Both Long and Bass Lakes have been evaluated regularly under this framework.

303(d) Impaired Waters Listings

Both lakes are listed on Wisconsin's 303(d) Impaired Waters List for mercury contamination in fish tissue. Bass Lake was listed in the 2010 cycle and Long Lake in the 2012 cycle. Mercury impairment in northern Wisconsin lakes results primarily from atmospheric deposition of mercury from regional and global sources (power plant emissions, industrial processes) rather than local pollution. Local management actions have limited ability to address this impairment; however, fish consumption advisories are in effect for both lakes and should be consulted before eating fish caught from these waters.

WisCALM Phosphorus and Chlorophyll-a Assessments

Both lakes were evaluated for total phosphorus and chlorophyll-a (algae) every two-year assessment cycle from 2012 through 2022. In each cycle, both lakes were found to have phosphorus and algae data indicating a healthy system. The applicable WisCALM criterion for total phosphorus in stratified seepage lakes is 15 µg/L; the chlorophyll-a criterion is 20 µg/L.

DNR Condition Ratings (Most Recent Assessment)

The DNR's Water Detail pages report the following overall condition ratings for each lake, derived from WisCALM evaluations and professional assessment:

Long Lake — General Condition: Excellent. Year Last Monitored: 2025. Fish and Aquatic Life: Excellent. Recreation: Good. Fish Consumption: Poor (mercury advisory).

Bass Lake — General Condition: Excellent. Year Last Monitored: 2025. Fish and Aquatic Life: Excellent. Recreation: Excellent. Fish Consumption: Poor (mercury advisory).

Trend Analysis Context: Why Proactive Management Is Needed Despite “Healthy” WisCALM Results

While the WisCALM assessments through 2022 found both lakes to be healthy for phosphorus and chlorophyll-a, the long-term statistical trend analysis presented in Sections 4.2 and 4.3 reveals a more nuanced picture. WisCALM evaluations use rolling averages from recent assessment windows, which can mask gradual, long-term directional changes. The 50+ year monitoring record analyzed for this management plan reveals statistically significant trends that the shorter WisCALM assessment windows have not yet captured:

Bass Lake shows statistically significant increasing phosphorus in both early summer ($p = 0.003$) and late summer ($p = 0.0005$), statistically significant increasing chlorophyll-a in both seasons, and statistically significant declining water clarity in late summer ($p = 0.010$). Long Lake shows statistically significant increasing phosphorus in early summer ($p = 0.013$) and statistically significant increasing chlorophyll-a in early summer ($p = 0.039$).

Both lakes currently hover near the 15 $\mu\text{g/L}$ WisCALM phosphorus criterion for stratified seepage lakes (Long Lake recent summer average 15–20 $\mu\text{g/L}$; Bass Lake 12–18 $\mu\text{g/L}$). At current rates of increase, phosphorus concentrations in Bass Lake have risen approximately 6–7 $\mu\text{g/L}$ over the 26-year monitoring record. Without intervention, one or both lakes may exceed the WisCALM phosphorus threshold within the planning horizon, triggering a formal impairment listing for nutrients — in addition to the existing mercury listings.

This is precisely the situation where proactive management is most effective and most fundable: the scientific data demonstrate a clear trajectory toward degradation, but the lakes have not yet crossed the impairment threshold. Intervention now — through watershed best management practices, septic system maintenance, and stormwater runoff reduction — can reverse these trends at far lower cost than restoration after impairment occurs.

4.7 Phosphorus Budget Analysis

A phosphorus budget quantifies the sources and relative contributions of phosphorus entering a lake, providing essential guidance for targeting management actions to the most significant loading sources. For seepage lakes like Long and Bass Lakes, the primary potential sources of phosphorus include: atmospheric deposition (rainfall and dry deposition directly onto the lake surface), septic system leachate from lakefront properties, stormwater runoff from developed areas and road surfaces, groundwater inflow carrying dissolved phosphorus, and internal loading from anoxic bottom sediments releasing stored phosphorus back into the water column.

The Wisconsin Lake Modeling Suite (WiLMS), developed by the Wisconsin DNR, is the standard tool for estimating phosphorus budgets in Wisconsin lakes. WiLMS uses lake morphometry, watershed characteristics, land use data, and empirical coefficients to estimate phosphorus loading from each source category. For seepage lakes with no surface water inflows, WiLMS is particularly useful in distinguishing between controllable sources (septic systems, stormwater runoff) and less controllable sources (atmospheric deposition, background groundwater).

A formal WiLMS analysis has not yet been completed for Long or Bass Lake. However, the available data suggest that septic systems and stormwater runoff are likely the two largest controllable phosphorus sources. Research on similar Wisconsin seepage lakes indicates that septic systems can contribute 30–50% of total phosphorus loading where lakefront development density is moderate to high. The septic system inventory (Section 7.3) identified 23 lakefront properties (12%) with no septic permit on file, highlighting a potential source of unregulated phosphorus loading. Stormwater runoff from County Highway B and Lon Basco Lane, channeled to the lakes through the four priority culvert locations (Section 7.2), represents an additional concentrated loading pathway.

Recommendation. Completing a WiLMS phosphorus budget analysis is recommended as a priority data collection activity. This analysis can be conducted by DNR Lakes staff, a contracted limnologist, or through a university partnership, and can be included as an eligible cost in a Surface Water Implementation grant. The results would quantify the relative contribution of each phosphorus source category, enable the Association to target management actions to the largest controllable sources, and provide a quantitative baseline against which the effectiveness of implemented practices can be measured over time.

5. AQUATIC PLANTS AND HABITAT

5.1 2002 Sensitive Area Survey

The Wisconsin DNR conducted an Integrated Sensitive Area Survey of Long and Bass Lakes on July 17, 2001 (published 2002). This multi-disciplinary assessment involved fisheries biologists, aquatic plant specialists, wildlife biologists, and water management specialists.

Key Findings:

Finding	Details
Sensitive Areas Identified	10 sites across both lakes
Special Concern Species	Farwell's Watermilfoil (* <i>Myriophyllum farwellii</i> *) found at 4 sites
Aquatic Plant Diversity	Low; only a few large plant beds
Exotic Species (2001)	None documented

Overall Assessment

Entire water body considered sensitive to development and habitat loss

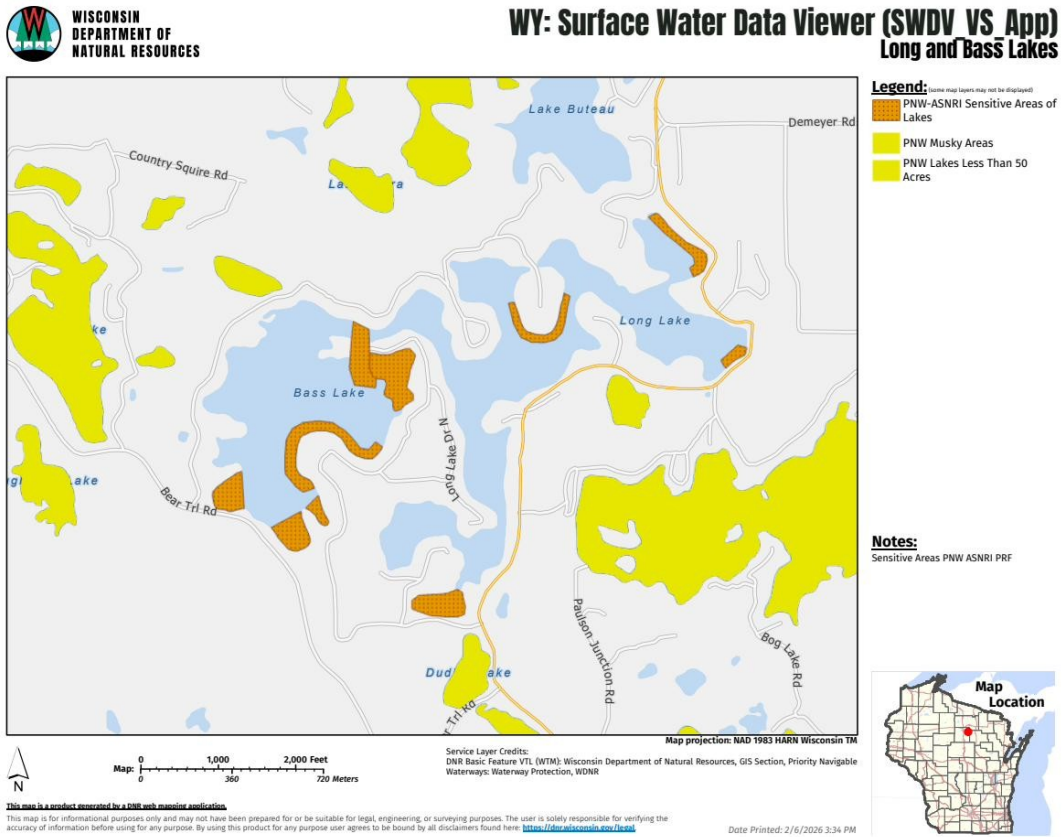


Figure 5.1: DNR Surface Water Data Viewer map showing designated sensitive areas (cross-hatched) around Long and Bass Lakes.

Farwell's Watermilfoil is listed in Wisconsin's Natural Heritage Inventory as a Species of Special Concern. This native plant must be protected and no removal is permitted.

Whole Lake Recommendations from the Survey:

1. Protect and maintain all aquatic plant beds (not abundant)
2. Prevent establishment of exotic/invasive species
3. Protect Farwell's Watermilfoil at all locations
4. Comply with shoreland zoning standards including no-cut buffers and setbacks
5. Restore or maintain shoreland buffers (35-50 feet minimum recommended)
6. Create walleye spawning habitat near boat launch on CTH B
7. Continue water quality monitoring for early detection of change

The complete 2002 Sensitive Area Survey Report is included in Appendix F.

5.2 Current Conditions

No formal aquatic plant point-intercept (PI) survey has been conducted on Long Lake or Bass Lake. The two best available data sources for aquatic plant communities are the 2002 DNR Sensitive Area Survey and the 2024 Lincoln County AIS monitoring survey.

The **2002 Sensitive Area Survey** documented plant communities at 10 sensitive sites across both lakes. Key findings included low overall plant density, the presence of Farwell's Watermilfoil (*Myriophyllum farwellii*) at four sites, and several other native submergent and emergent species. The survey characterized the lakes as having sparse submergent and floating vegetation over approximately 20% of the lake basin.

The **2024 AIS monitoring survey**, conducted by Lincoln County Land Services Department staff following WDNR early detection protocols, documented 17 native aquatic plant species across 25 targeted search sites on both lakes (see Section 9.2 and Appendix E for full details). No new aquatic invasive species were detected. The diversity of native species documented — including Common Bladderwort, Watershield, White Water Lily, Pickerel Weed, Alternate-Flowered Milfoil, Pipewort, and Needle Spikerush — indicates the lakes continue to support healthy native plant communities consistent with soft-water, oligotrophic to mesotrophic seepage lakes.

General observations indicate submergent vegetation remains present but not dense, consistent with the 2002 finding of low plant density, with emergent vegetation concentrated in protected bays.

5.3 Aquatic Plant Data Gap

Neither the 2002 Sensitive Area Survey nor the 2024 AIS monitoring survey used the DNR's standard point-intercept methodology (PUB-SS-1068 2010), which provides quantitative data on species frequency, distribution, and relative abundance across a systematic grid. This represents a data gap in the plan's baseline information.

The available data — site-specific species lists from 2002, species presence data from 2024, and over two decades of observational monitoring — provide a reasonable qualitative baseline for current planning purposes. The consistency between the 2002 and 2024 findings suggests the plant community has remained relatively stable.

However, a formal PI survey is recommended as a **high-priority action** (moved up from Years 4-10 in earlier drafts to Years 1-2 in the Action Plan). A PI survey would:

- Establish quantitative baseline data for long-term trend monitoring
- Verify the continued presence and distribution of Farwell's Watermilfoil, a Species of Special Concern
- Provide the data standard required by WDNR for future aquatic plant management decisions

- Enable early detection of changes in plant community composition that may signal water quality shifts
- Strengthen future grant applications that require aquatic plant data

The Association will consult with the WDNR Lakes Biologist regarding whether DNR assistance is available for conducting the survey and whether volunteer-conducted surveys require Aquatic Plant Taxonomic Assurance certification.

6. FISHERY RESOURCES

6.1 Fish Species Present

Both lakes support healthy fish populations including Largemouth Bass, Northern Pike, and panfish (Bluegill, Perch, Crappie). Walleye are present from previous stocking efforts.

6.2 Stocking History

Both lakes have a substantial stocking history spanning over 50 years.

Bass Lake received significant DNR stocking from 1972-2001:

- 1972: 170 muskellunge fingerlings
- 1987-1999: Over 81,000 brown trout (plus 350 brook trout in 1990)
- 1999-2001: 3,800 walleye (source unknown)

Long Lake stocking includes both DNR and Association efforts:

- 1972: 275 muskellunge fingerlings (DNR)
- 2001-2003: 2,485 walleye (DNR)
- 2005-2024: 9,873 walleye in 8 stocking events (Association-funded)

The Association's private walleye stocking went into Long Lake, which connects to Bass Lake via navigable channel. Documented Association costs for 2019-2024 total \$10,815; earlier costs were not recorded.

Complete stocking records for both lakes are included in Appendix H.

6.3 Stocking Discontinuation

At the May 2025 Annual Meeting, members voted to discontinue fish stocking due to cost, concerns about walleye predation on panfish, and equity issues with non-member anglers benefiting from the program.

6.3 Special Fishing Regulations

Bass Lake Special Regulation: Only ONE bass may be kept, and it must be at least 18 inches (trophy bass management).

6.5 DNR Lake and Fish Classification

The Wisconsin DNR classifies both Long Lake (WBIC 1001000) and Bass Lake (WBIC 969600) under the Natural Community Determination framework as Deep Seepage lakes. This classification reflects the lakes' depth, glacial origin, and groundwater-fed hydrology, and is a core component of the state's resource management framework for predicting fish assemblages and setting management expectations.

Deep seepage lakes are characterized by significant depth relative to surface area, groundwater as the primary water source, and thermal stratification that creates distinct warm and cold water zones (see Section 4.4). These characteristics support diverse fish communities spanning warmwater species (largemouth bass, northern pike, bluegill, perch, crappie) in the upper water column and coolwater species (walleye) in deeper areas. Long Lake's greater maximum depth (64 feet) provides more extensive coldwater habitat than Bass Lake (43 feet), and Bass Lake's history of brown trout stocking (1987–1999) reflects past DNR management of the lake as a potential two-story fishery supporting both warm and coldwater species.

The current fish community is managed primarily for warmwater and coolwater species, consistent with the deep seepage lake classification. The Bass Lake trophy bass regulation (Section 6.3) reflects the DNR's recognition of the lake's value as a quality bass fishery. Both lakes' fish communities benefit from the relatively undeveloped watershed (49% forested), good water clarity, and the habitat diversity provided by their connected waterway.

7. SHORELAND CONDITIONS

7.1 Development Density

Lake	Lakefront Properties	Development Level
Long Lake	163	Moderate
Bass Lake	53	Moderate
TOTAL	216	â€”

7.2 Road Runoff and Culvert Issues

Road runoff has been identified as a significant source of sediment and nutrients entering the lakes, potentially a greater concern than natural shoreline erosion.

Identified Problem Areas:

- W1463 Lon Basco Lane water runs downhill on road and through trench to Bass Lake
- County Hwy B next to Packer Point Drive
- County Hwy B downhill from Packer Point Drive
- County Hwy B at Horseshoe Bend

Recommended Action: Partner with Lincoln County Highway Department and Town of Harrison to assess and improve culvert filtration at these locations.

7.3 Septic System Assessment

For deep seepage lakes like Long and Bass Lakes, septic systems are a primary controllable source of phosphorus-estimated at 30-50% of total nutrient loading. Nutrients from septic systems travel through groundwater directly to the lakes.

Lincoln County Permit Database Analysis:

A review of Lincoln County Land Services Department septic permit records for all 196 developed lakefront parcels revealed:

Category	Parcels	Percentage
Complete permit data	156	80%
Permit on file, year unknown	17	9%
No permit on file	23	12%
TOTAL	196	100%

Key Findings:

- 23 properties (12%) have no septic permit in the county database. These systems likely predate permit requirements or records were never digitized.
- 17 properties (9%) have permits but installation year is unknown, making it impossible to assess system age.
- 40 properties (20%) have incomplete septic documentation overall.

Properties with No Permit on File (requiring follow-up):

These 23 properties are distributed along County Road B, Long Lake Drive, Lon Basco Lane, Bass Lake Lane, and Bear Trail Road. Many may have older systems installed before modern permit requirements.

Implications:

- Older septic systems (pre-1970s) may not meet current standards
- Systems without maintenance records may be failing undetected
- Failing systems can contribute significant phosphorus loads to groundwater

Recommended Actions:

8. Education: Distribute septic maintenance information to all lakefront property owners
9. Voluntary inspections: Encourage properties with unknown system status to have inspections
10. Healthy Lakes: Promote septic system upgrades through Healthy Lakes grant program
11. Tracking: Maintain Association database of known septic system ages and types

Data source: Lincoln County Land Services Department GIS Viewer, accessed January 2026

7.4 Shoreland Habitat Assessment

Appendix B of the DNR Surface Water Grant Application Guide requires a shoreland habitat assessment documenting the condition of the shoreland zone and the percentage of shoreland that is developed. The following summarizes available information about shoreland conditions around Long and Bass Lakes and identifies remaining data gaps.

Historical Baseline and Development Trends

The 1982 DNR Surface Water Inventory describes Long Lake's shoreline as "entirely upland consisting of 80 percent hardwoods and 20 percent hemlock" and Bass Lake's shoreline as "upland consisting primarily of hardwoods." At that time, Long Lake had 127 dwellings along the shoreline. Today, 163 lakefront properties are identified on Long Lake and 53 on Bass Lake, representing a 28% increase in Long Lake shoreline development over approximately four decades. All development is residential — seasonal and year-round homes — with no commercial or industrial land use on either lake.

2002 Sensitive Area Survey Findings

The 2002 DNR Integrated Sensitive Area Survey identified 10 sensitive area sites across both lakes and concluded that the entire water body is "unique and should be considered sensitive to development and loss of habitat." The survey explicitly recommended protecting and maintaining all aquatic plant beds and stated that "although only ten specific areas have been designated as sensitive areas, this entire body of water is unique and should be considered sensitive to development and loss of habitat." This whole-lake sensitivity designation underscores the importance of maintaining natural shoreland conditions throughout the system.

Current General Conditions

Shoreland conditions around Long and Bass Lakes are variable. Most properties feature some combination of maintained lawn, natural forest cover, and sandy beach areas. The predominant upland soils are sandy glacial deposits, which are highly permeable and

allow rapid infiltration — beneficial for reducing surface runoff but also creating a direct groundwater pathway for nutrients from septic systems and lawn fertilizers. Some properties maintain natural vegetated buffers between developed areas and the shoreline, while others have lawn extending to the water's edge. Impervious surfaces (roofs, driveways, patios) are present on most developed parcels but are generally modest in extent given the residential character of the area.

The NLCD land cover analysis (Section 8) classifies 13.1% of the watershed as Developed Open Space — a category that includes lawns, parks, and low-density residential land. This relatively low development intensity, combined with 49% forest cover and no agricultural land, contributes to the generally good water quality conditions documented in Section 4. However, the statistically significant increasing phosphorus trends (Section 4.3) and declining Bass Lake water clarity (Section 4.2) indicate that cumulative development impacts are beginning to affect water quality despite the overall low-intensity land use.

Percentage of Shoreland Developed

Based on parcel analysis, approximately 216 lakefront properties are present across both lakes. Applying the NLCD Developed Open Space percentage (13.1%) to the riparian corridor provides a general estimate, but a more precise assessment requires on-the-ground evaluation. The 1982 inventory documented 127 dwellings on Long Lake alone; current development represents approximately 70% greater total shoreline occupancy across both lakes compared to that baseline.

Data Gap and Recommendation

No formal standardized shoreland condition inventory using a recognized protocol has been completed for Long or Bass Lakes. Two complementary assessment approaches are recommended to fill this gap, each serving a distinct purpose.

WDNR Lakeshore Habitat Assessment. Tom Boisvert of Lincoln County Land Services and DNR Lakes Biologist Scott Van Egeren have recommended conducting a comprehensive shoreland habitat assessment using the WDNR Lake Shoreland & Shallows Habitat Monitoring Field Protocol (Hein et al. 2016). This standardized protocol, co-authored by Van Egeren and used on over 80 Wisconsin lakes, involves a boat-based survey of every lakefront parcel documenting riparian buffer vegetation, bank modifications and erosion, littoral zone structures, runoff concerns, and coarse woody habitat. The survey produces quantitative, parcel-by-parcel data that is entered into the DNR's SWIMS database and displayed on the Lakes & AIS Viewer. For lakes the size of Long and Bass (approximately 216 parcels), the full three-loop survey — georeferenced shoreline photography, habitat assessment by parcel, and coarse woody habitat inventory — can be completed in approximately two to three field days by a trained two-person crew. The Association will coordinate with Scott Van Egeren to obtain the

finalized protocol methodology and determine whether the assessment can be conducted by trained Association volunteers, county staff, or a consultant. Completing this assessment before the November 2026 grant application deadline would significantly strengthen application scoring under Planning Efforts (formal shoreland condition inventory using recognized protocol) and Likelihood of Success (systematic identification of priority parcels for shoreland improvement practices).

Score My Shore Self-Assessment. As a complementary approach, the Association plans to promote the University of Wisconsin-Extension "Score My Shore" self-assessment tool through its volunteer monitoring program and member outreach, beginning with a component in the 2026 member survey. Score My Shore enables individual property owners to evaluate their own shoreline condition and receive personalized recommendations for Healthy Lakes best management practices — native plantings, rain gardens, diversions, rock infiltration trenches, and fish sticks. This self-assessment approach generates member engagement and awareness while identifying willing participants for Healthy Lakes grant-funded practices. Together, the formal WDNR assessment provides the comprehensive baseline data needed for grant applications, while Score My Shore builds the community participation needed for successful implementation.

7.5 Riparian Land Ownership

Appendix B of the DNR Surface Water Grant Application Guide (item 7) requires documentation of riparian ownership patterns, including the distribution of public and private land along the shoreline and any conservation easements or other protective designations. The following analysis is based on the Wisconsin Statewide Parcel Database and Lincoln County tax records for parcels identified as lakefront on Long and Bass Lakes.

Ownership Summary

The shoreline of Long and Bass Lakes is almost entirely in private ownership. Of 212 lakefront parcels encompassing approximately 292 assessed acres, 211 parcels (99.5%) are privately owned and one parcel (0.5%) is owned by Lincoln County. The county parcel is a small 0.11-acre lot associated with the public boat landing on County Highway B, which provides the sole public access point to both lakes.

Of the 211 private lakefront parcels, 190 are developed with residential structures (assessed improvement value greater than zero) and 22 are vacant land. The vacant parcels total approximately 36.8 acres with a combined assessed land value of \$1.45 million. No lakefront parcels are enrolled in the Managed Forest Law (MFL) program, and no conservation easements are recorded on any lakefront property in the county database.

Public Land in the Watershed

While public ownership on the immediate shoreline is limited to the boat landing, the broader watershed includes several additional public parcels: a Lincoln County Public Access parcel, two small State of Wisconsin – DNR parcels (totaling approximately 0.2 acres), and three Town of Harrison parcels (totaling approximately 3.75 acres). These parcels are in the broader eligible area surrounding the lakes but are not directly on the shoreline. The limited public ownership means that virtually all shoreland management actions will require voluntary cooperation from private landowners.

Property Classification

Lakefront parcels are predominantly classified as Residential (Wisconsin Property Class 1), with 204 of 212 parcels (96%) carrying this designation. A small number of parcels carry mixed classifications including Undeveloped (Class 5) and Forest (Class 6) components, indicating larger parcels with both residential and undeveloped portions. These mixed-class parcels represent some of the largest lakefront holdings and may offer opportunities for conservation practices on their undeveloped acreage.

Implications for Lake Management

The near-total private ownership of the shoreline has several important implications for management planning. First, all shoreland improvement projects under the Healthy Lakes program will require willing private landowner participation, making community engagement and education essential to implementation success. The Association’s strong membership base (219 households) and established communication channels provide an effective platform for recruiting participants. Second, the absence of conservation easements represents both a gap and an opportunity — no existing protections are in place for sensitive shoreland areas identified in the 2002 Sensitive Area Survey, but future acquisition or easement grants could protect critical habitat. Third, the 22 vacant lakefront parcels represent potential future development that could increase impervious surfaces and reduce natural buffers if not managed carefully through county zoning enforcement and voluntary best practices adopted before construction.

8. WATERSHED ANALYSIS

8.1 Healthy Watersheds Ranking

Long and Bass Lakes are located within the Upper Prairie River Watershed, which is recognized by the Wisconsin DNR as one of the state's healthiest watersheds.

Metric	Value
Statewide Ranking	68 of 1,744 watersheds
Percentile	Top 4% statewide
Classification	Top 30% Healthiest Watersheds

Source: WDNR Healthy Watersheds, High Quality Water (HWHQW) Assessment

This ranking reflects the watershed's excellent water quality, intact natural land cover, and limited development pressure. Maintaining this status is a key goal of this management plan.

8.2 Prairie River Watershed Context

Long and Bass Lakes are part of the larger Prairie River Watershed (HUC UW30).

Prairie River Watershed Characteristics:

Metric	Value
Total Area	263.99 sq mi
Stream Miles	273.14 miles
Lake Acres	2,082.78 acres
Wetland Acres	34,162.59 acres

Land Use Composition:

Land Use	Percentage
Forest	58.8%
Wetland	27.2%
Grassland	5.8%
Other	8.2%

DNR Nonpoint Source Rankings:

Category	Ranking	Implication
Runoff impacts on streams	Medium	Some concern
Runoff impacts on lakes	Medium	Some concern
Runoff impacts on groundwater	Low	Minimal concern
Overall Watershed Ranking	Low	Favorable for grant funding

The "Low" overall nonpoint source ranking indicates limited pollution pressure from the broader watershed, supporting eligibility for state and county grant programs.

8.3 Lake Type and Hydrology

Both Long Lake and Bass Lake are classified as Deep Seepage Lakes.

What this means:

- No surface inlet streams or outlet streams
- Lakes are fed primarily by groundwater and direct precipitation
- Water leaves through groundwater seepage and evaporation
- Water residence time is relatively long
- Lakes are particularly sensitive to shoreline and near-shore land use changes

Implications for management:

- Septic systems directly influence lake water quality (groundwater pathway)
- Shoreland buffers are critical for filtering runoff before it enters groundwater
- Nutrient inputs tend to accumulate rather than flush through
- Phosphorus management is essential to prevent long-term degradation

8.4 Watershed Boundaries and Size

Metric	Value
Total Watershed Area	~3.5 sq km (~1.35 sq mi)
Combined Lake Surface Area	0.91 sq km (225 acres)
Watershed to Lake Ratio	~3.8:1

The small watershed-to-lake ratio means:

- Limited land area drains into the lakes
- Local actions have outsized impact on water quality
- The lakes are more influenced by direct shoreline activity than by upstream land use
- Homeowner practices (fertilizers, septic maintenance, buffers) are the primary controllable factors

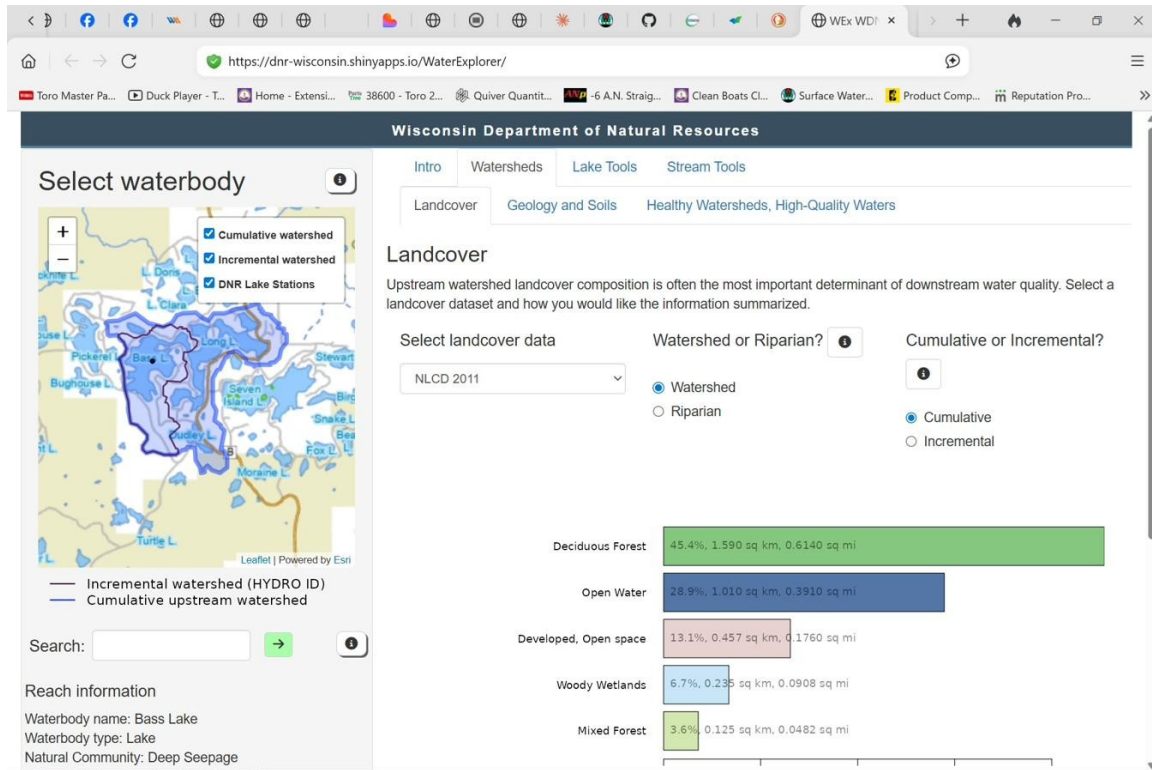


Figure 8.1: Wisconsin Water Explorer watershed view showing land cover composition.

8.5 Land Cover Analysis

Data Source: Wisconsin Water Explorer, NLCD 2011

Land Cover Category	Percentage	Area (sq mi)	Water Quality Impact
Deciduous Forest	45.4%	0.61	Excellent - filters runoff
Open Water	28.9%	0.39	Lakes themselves
Developed, Open Space	13.1%	0.18	Moderate - lawns, roads
Woody Wetlands	6.7%	0.09	Excellent - natural filtration
Mixed Forest	3.6%	0.05	Excellent - filters runoff
Evergreen Forest	1.7%	0.02	Excellent - filters runoff
Herbaceous	0.6%	0.01	Low impact
Agriculture	0.0%	0.00	None - no ag runoff concerns

Key Finding: Over 50% of the watershed is forested, providing excellent natural water quality protection.

8.6 Watershed Strengths

- High forest cover (51%) — Provides excellent water quality protection through filtration and nutrient uptake
- No agricultural land use — Eliminates concerns about fertilizer and manure runoff
- Wetlands (6.7%) — Provide natural filtration and wildlife habitat
- Small watershed — Local actions have significant, measurable impact
- Top 4% statewide ranking — Exceptional baseline conditions worth protecting
- Groundwater-fed system — Generally cleaner water input than surface runoff

8.7 Watershed Concerns

- Developed land (13.1%) — Residential development contributes nutrients through:
 - Lawn fertilizers
 - Septic system effluent (groundwater pathway)
 - Impervious surfaces (roofs, driveways)
 - Pet waste
- Road runoff — County Road B and local roads contribute sediment and salt
- Climate change — Increased storm intensity may accelerate erosion and nutrient loading

8.8 Nutrient Loading

As seepage lakes with no inlet streams, Long and Bass Lakes receive nutrients primarily from:

12. Atmospheric deposition — Rain and dust (largely uncontrollable)
13. Groundwater — Carries nutrients from septic systems and fertilized lawns
14. Direct runoff — From shoreline properties and roads during rain events
15. Internal loading — Phosphorus released from lake sediments under low-oxygen conditions

Estimated Phosphorus Sources (typical seepage lake):

Source	Approximate Contribution
Septic systems	30-50%
Lawn fertilizers/runoff	20-30%
Atmospheric deposition	15-25%
Internal loading	10-20%

Note: These are general estimates for seepage lakes of this type. Site-specific nutrient budgets require detailed modeling.

Management Implications:

- Septic system maintenance is the single most controllable factor (see Section 7.3 for permit analysis showing 23 properties with no permit on file)
- Phosphorus-free fertilizers should be used within the watershed
- Shoreland buffers reduce direct runoff contributions
- Preventing further water quality decline is more cost-effective than restoration

9. AQUATIC INVASIVE SPECIES

9.1 Current Status

Species	Long Lake	Bass Lake	Concern Level
Chinese Mystery Snail	CONFIRMED	CONFIRMED	LOW-MODERATE
Eurasian Watermilfoil	Not detected	Not detected	HIGH - prevent
Zebra Mussels	Not detected	Not detected	HIGH - prevent
Curly-leaf Pondweed	Not detected	Not detected	MODERATE

9.2 2024 AIS Monitoring Survey

Lincoln County Land Services Department conducted a comprehensive AIS monitoring survey of both lakes in summer 2024.

Survey Details:

- Field Crew: Sam Coates and Hayley Djupstrom (AIS Limited Term Employees)
- Long Lake Survey Dates: July 19 & 22, 2024
- Bass Lake Survey Dates: July 31 & August 2, 2024
- 25 targeted search sites surveyed (see Appendix E for site map)
- All WDNR early detection monitoring protocols followed
- Data submitted to Surface Water Integrated Monitoring System (SWIMS)

Key Findings:

- No new AIS detected — lakes remain healthy
- Chinese Mystery Snails confirmed (previously known)
- 17+ native aquatic plant species documented
- AIS signage at boat landing verified as current

Native Plants Documented:

Common Bladderwort, Creeping Bladderwort, Watershield, White Water Lily, Pickerel Weed, Bur-reed, Alternate-Flowered Milfoil (native species), Arrowhead, Water Smartweed, Jewelweed, Needle Spikerush, Pipewort, Small Duckweed, Coontail, Water Arum, Fireweed, Common Hops, Broad-leaved Cattail, Bullhead Pond Lily

The presence of diverse native plant communities indicates good overall lake health and habitat quality.

9.3 Prevention Gap

The Association does not currently participate in the Clean Boats, Clean Waters program. This represents a significant gap in AIS prevention at the Lincoln County boat landing.

10. COMMUNITY VALUES AND CONCERNS

10.1 Survey Results

[TO BE POPULATED AFTER MEMBER SURVEY IS COMPLETED]

10.2 Wake Boat Concerns

Wake boats have emerged as a concern among lake residents. At 106 and 119 acres, these lakes are small for wake boat operation. Much of both lakes is less than 15 feet deep, where wake boats can resuspend bottom sediments and release phosphorus back into the water column.

Additional concerns include shoreline erosion from large wakes, safety issues for small watercraft, and disturbance to, and destruction of, waterfowl (especially Loon) nesting areas and fish habitat and spawning beds.

11. MANAGEMENT ALTERNATIVES AND DECISION-MAKING FRAMEWORK

This section documents management approaches that were evaluated during the planning process, including options that were considered but not recommended, and establishes a framework for how the Association will evaluate management decisions going forward.

11.1 Alternatives Considered

The following management approaches were evaluated during plan development. Each was assessed for feasibility, expected effectiveness, cost, potential adverse effects, and alignment with the Association's protection-oriented management philosophy.

Chemical Treatment for Chinese Mystery Snails — Not Recommended

Chinese Mystery Snails (*Cipangopaludina chinensis*) are confirmed present in both lakes. Chemical treatment was evaluated and rejected for several reasons: no chemical treatment has been approved by the WDNR as effective for this species; available molluscicides pose significant risk to native invertebrates and the broader aquatic ecosystem; and the DNR does not recommend chemical control for Chinese Mystery Snails. The recommended approach is continued monitoring, public education about not moving snails between waterbodies, and maintaining healthy native species communities that compete with invasive populations.

Mechanical Aquatic Plant Harvesting — Not Recommended

Mechanical harvesting of aquatic vegetation was evaluated and rejected. Both the 2002 Sensitive Area Survey and 2024 AIS monitoring confirm that aquatic plant density in both lakes is naturally low — sparse submergent and floating vegetation across approximately 20% of the lake basin. The 2002 survey explicitly recommended protecting and maintaining all aquatic plant beds (which are “not abundant”) and stated that no chemical, physical, or mechanical treatments should be applied to aquatic plants. Harvesting would also risk damage to Farwell’s Watermilfoil (*Myriophyllum farwellii*), a Species of Special Concern documented at four sensitive area sites, for which no removal is permitted under Wisconsin law.

Alum Treatment for Phosphorus Control — Not Recommended at This Time

Aluminum sulfate (alum) treatment to bind phosphorus in lake sediments was evaluated. While alum treatment is an established technique for lakes with severe internal phosphorus loading, it was determined to be premature for Long and Bass Lakes for the following reasons: current total phosphorus levels (Long Lake median 10.3 µg/L, Bass Lake median 14.5 µg/L) remain below the WisCALM impairment threshold of 15 µg/L for stratified seepage lakes; the cost of alum treatment (typically \$500–\$1,500 per acre) would be disproportionate to current conditions; and external sources of phosphorus (road runoff, septic systems) should be addressed first, as alum treatment does not prevent new phosphorus inputs. This option will be reconsidered if phosphorus levels show sustained increases above 15 µg/L despite implementation of watershed best management practices.

Continued Walleye Stocking — Discontinued

The Association funded private walleye stocking into Long Lake from 2005 to 2024, investing an estimated \$25,000–\$30,000 over that period. At the May 2025 Annual Meeting, members voted to discontinue the program based on: escalating costs (\$10,815 documented for 2019–2024 alone); ecological concerns about walleye predation on native panfish populations (Bluegill, Perch, Crappie), which are valued by the majority of anglers on these lakes; equity concerns, as non-member anglers benefited equally from Association-funded stocking; and lack of evidence that stocking produced a self-sustaining walleye population. DNR stocking records show that neither

lake was historically managed as a walleye fishery. The discontinuation redirects financial resources toward water quality protection and habitat enhancement, which benefit the broader lake ecosystem.

Wake Boat Ordinance — Under Evaluation

A formal wake boat ordinance restricting wake-enhancing activities was considered as an immediate management action. The Association has elected to pursue an education-and-monitoring approach rather than immediate regulatory action for the following reasons: maintaining community consensus requires careful engagement rather than divisive regulation; voluntary compliance through education may achieve adequate results; current scientific data on wake impacts specific to these lakes is limited and a monitoring program will generate evidence to support future decisions; and the regulatory process for lake-specific boating ordinances through the Town of Harrison and WDNR is time-consuming and requires strong supporting evidence. The member survey (Section 10) will gauge community support for various approaches. Wake boat impacts will continue to be monitored, and the Association will pursue regulatory action if voluntary measures prove insufficient or if monitoring documents significant adverse effects.

11.2 Decision-Making Framework

The Association will use the following process for evaluating future management actions as conditions change or new information becomes available:

Step 1: Data Review. Annual review of water quality monitoring data, AIS survey results, and observational reports to identify trends, emerging issues, or action triggers (see Section 14 for specific monitoring thresholds).

Step 2: Expert Consultation. Consult with WDNR Lakes Biologist, Lincoln County Land Services, UW-Extension, and other technical resources to understand the issue, evaluate options, and identify best practices.

Step 3: Options Analysis. Develop and compare management alternatives using the following criteria: expected effectiveness in addressing the issue; estimated cost and available funding sources; potential adverse effects on the lake ecosystem, property owners, or recreational users; alignment with plan goals and community values; and regulatory requirements or constraints.

Step 4: Community Input. Present options and recommendations to the membership through the newsletter, special meetings, or surveys. Allow adequate time for review and comment.

Step 5: Decision and Implementation. Board action or membership vote (as appropriate to scope and cost), followed by implementation with clear timelines, responsible parties, and success metrics.

Step 6: Monitor and Adapt. Track outcomes against expected results. Adjust approach based on monitoring data. Report results to membership at the Annual Meeting.

This framework ensures that management decisions are data-driven, consider multiple perspectives, and maintain transparency with the Association's membership.

12. GOALS AND OBJECTIVES

GOAL 1: Protect and Improve Water Quality

- Maintain summer Secchi depth \geq 14 feet (Long Lake) and \geq 12 feet (Bass Lake)
- Stabilize phosphorus levels below 15 $\mu\text{g/L}$
- Partner with Lincoln County to address all identified culvert issues within 3 years
- Install Healthy Lakes practices on 20 properties within 5 years

GOAL 2: Prevent Aquatic Invasive Species

- Zero new detections of high-threat species (Eurasian watermilfoil, zebra mussels)
- Implement CBCW program with 200 inspection hours annually

GOAL 3: Enhance Habitat

- 15 properties installing native plantings
- 10 fish stick installations
- Support loon nesting success

GOAL 4: Address Wake Boat Impacts

- Complete wake boat impact assessment by Year 2
- Research and continue to present ordinance options to membership by Year 3

GOAL 5: Build Organizational Capacity

- Maintain 200+ active members
- Obtain \$25,000 in grant funding within 3 years

13. ACTION PLAN

Year 1 (2026) Priority Actions

16. Submit this plan for DNR approval
17. Apply for Healthy Lakes grant
18. Apply for CBCW grant and launch inspection program
19. Meet with Lincoln County regarding culvert improvements
20. Conduct member survey

21. Identify properties interested in Healthy Lakes practices
22. Create new property owner welcome packet

Years 2-3 (2027-2028)

- Install native plantings and fish sticks on 10-15 properties
- Work with Lincoln County on priority culvert improvements
- Conduct wake boat impact assessment as needed
- Continue CBCW inspections
- Host annual education events

Years 4-10 (2029-2035)

- Continue Healthy Lakes installations
- Conduct formal aquatic plant survey
- Pursue wake boat protective measures if warranted
- Update Lake Management Plan

13.4 Implementation Cost Estimates

The following cost projections support the action items above and demonstrate the Association's understanding of financial requirements for implementation. All costs are estimates based on current DNR grant program parameters, Lincoln County cost-share rates, and Association experience. Most DNR grants require a 25% local match; the Association's financial capacity to provide matching funds is documented in Section 16.

Year 1 (2026) Estimated Costs

- Healthy Lakes grant application and initial installations (5–8 properties): \$12,500–\$20,000 total project cost (\$1,000 per practice, up to \$25,000 grant with 25% match of \$6,250 from Association/property owners)
- Clean Boats, Clean Waters grant and inspection program: \$4,000 grant plus approximately \$1,000 Association match for signage, supplies, and coordinator time
- Member survey (online and paper distribution): \$200–\$400 (printing, postage)
- New property owner welcome packets: \$300–\$500 (design, printing, distribution)
- Dissolved oxygen meter replacement: \$500–\$1,500
- Water quality monitoring (CLMN volunteer program): \$200–\$400 (supplies, lab shipping — lab analysis provided free through CLMN)

Years 2–3 (2027–2028) Estimated Costs

- Healthy Lakes installations (10–15 additional properties): \$20,000–\$30,000 total project cost (second grant cycle application)
- Culvert improvement projects (partnership with Lincoln County Highway Department): \$10,000–\$50,000 per site depending on scope — county and town

share primary costs; Association contributes through Implementation grant match if applicable

- Aquatic plant point-intercept survey: \$5,000–\$10,000 (professional botanist, can be included as eligible cost in Implementation grant)
- Continued CBCW inspections: \$4,000–\$5,000 per year (grant-funded with match)
- Annual education events (speakers, materials, venue): \$500–\$1,000 per year

Years 4–10 (2029–2035) Estimated Costs

- Continued Healthy Lakes installations (additional grant cycles as needed): \$10,000–\$25,000 per cycle
- Lake Management Plan 5-year update: \$2,000–\$5,000 (can be volunteer-driven with professional review, or included in a new Planning grant)
- Ongoing monitoring, maintenance, and education: \$2,000–\$3,000 per year (Association operating budget)

Funding Strategy Summary

The Association's approach prioritizes leveraging grant funding to maximize the impact of local investment. For every \$1 the Association and its members invest in matching funds, DNR grants provide \$3 in additional project funding. Over the first five years of plan implementation, estimated total project investment across all categories is \$75,000–\$150,000, of which approximately \$55,000–\$110,000 would come from grant sources and \$20,000–\$40,000 from Association funds and in-kind contributions. The Association's current assets of \$48,695 and annual dues revenue from 219 member households provide a solid financial foundation for sustaining these investments. Volunteer contributions — currently exceeding 500 hours annually for monitoring alone — represent substantial additional in-kind value that strengthens grant applications and reduces direct costs.

14. MONITORING AND EVALUATION

14.1 Water Quality Monitoring

Parameter	Frequency	Method
Secchi depth	4x per summer	CLMN protocol
Total phosphorus	4x per summer	State Lab of Hygiene
Chlorophyll-a	4x per summer	State Lab of Hygiene
Temperature/DO profile	Monthly (May-Sep)	Electronic probe

14.2 Progress Review

- Plan reviewed annually by Association Board
- Progress reported at Annual Meeting

- Plan formally updated every 5 years
- Obtain replacement dissolved oxygen meter

14.3 Measurable Outcomes and Adaptive Management Triggers

Appendix B Module 5 of the DNR Surface Water Grant Application Guide requires measurable outcomes for recommended management activities and a framework for adaptive management responses. The following trigger thresholds connect the monitoring program (Section 14.1) to specific management actions, ensuring that the Association can detect and respond to changing conditions before water quality degradation becomes irreversible.

Water Quality Triggers

The WisCALM impairment threshold for total phosphorus in stratified seepage lakes is 15 µg/L, and for chlorophyll-a is 20 µg/L (see Section 4.6). Both lakes are currently assessed as “healthy” but Long Lake’s recent average TP (15–20 µg/L) already straddles the threshold, and Bass Lake shows statistically significant increasing TP trends ($p=0.003$ early summer, $p=0.0005$ late summer). The following trigger-response framework addresses each key parameter:

Total Phosphorus. If the 3-year rolling average TP for either lake exceeds 12 µg/L (early warning) or 15 µg/L (WisCALM threshold), the Association will: (1) intensify septic system outreach to properties identified in the Section 7.3 permit gap analysis, (2) expand Healthy Lakes practice recruitment to prioritize properties with the highest runoff potential, and (3) request a DNR nutrient budget study to identify primary loading sources. The target outcome is to maintain 3-year rolling average TP below 12 µg/L for Bass Lake and stabilize Long Lake TP at or below current levels.

Water Clarity (Secchi Depth). If the summer average Secchi depth for Bass Lake declines below 8 feet (approximately half the current typical reading) for two consecutive years, or if Long Lake Secchi declines below 10 feet for two consecutive years, the Association will: (1) commission a professional watershed assessment to identify contributing factors, (2) accelerate shoreland buffer implementation, and (3) consult with DNR Lakes staff on potential intervention strategies. The target outcome is to halt and reverse the statistically significant clarity decline documented in Bass Lake ($p=0.010$) and maintain Long Lake clarity at or above current levels.

Chlorophyll-a. If 3-year rolling average chlorophyll-a exceeds 10 µg/L for either lake (half the WisCALM threshold of 20 µg/L), the Association will pursue the same escalation steps as the TP trigger. Persistent algae blooms visible to residents will be documented with photographs and dates and reported to the DNR through the Citizen Lake Monitoring Network.

Dissolved Oxygen. Once the replacement DO meter is obtained, the Association will establish baseline hypolimnetic oxygen profiles. If late-summer DO at depth falls below 2 mg/L (indicating severe oxygen depletion) in multiple years, this will be reported to the DNR as evidence of accelerating eutrophication and will strengthen the case for nutrient reduction interventions.

Aquatic Invasive Species Triggers

Detection of any new aquatic invasive species during annual AIS monitoring or through citizen reports will trigger an immediate rapid response: (1) confirm identification with Lincoln County AIS Coordinator or DNR, (2) document location, extent, and density, (3) notify all Association members within 48 hours, (4) contact DNR for rapid response guidance and potential emergency grant funding, and (5) apply to the AIS Population Management grant program within the next grant cycle. The target outcome is zero new AIS introductions; the measurable benchmark is annual professional AIS monitoring documenting continued absence of high-priority threats (Eurasian watermilfoil, zebra mussels, curly-leaf pondweed).

Shoreland Condition Benchmarks

Following completion of the Score My Shore baseline assessment (Section 7.4), the Association will set quantitative improvement targets for shoreland condition. The initial benchmark is to complete Score My Shore assessments for at least 50% of lakefront properties within two years of plan adoption. Subsequent targets include enrolling at least 10 properties per year in Healthy Lakes best management practices and achieving measurable improvement in average Score My Shore ratings across reassessed properties at the 5-year plan update.

Community Engagement Metrics

The Association will track participation metrics as indicators of implementation capacity: member survey response rate (target: 40% or higher), annual meeting attendance, volunteer monitoring hours (current baseline: 500+ hours annually), and Healthy Lakes practice enrollment. If volunteer monitoring participation drops below a level sufficient to maintain consistent data collection (fewer than 4 sampling events per summer per lake), the Association will evaluate whether paid monitoring services are needed to maintain the long-term dataset.

Adaptive Management Review Cycle

The Association Board will review all trigger indicators annually using the most recent monitoring data and present findings at the Annual Meeting. If any trigger threshold is exceeded, the Board will activate the corresponding response actions and report progress at the following Annual Meeting. The full management plan will be formally reviewed and updated every five years, incorporating the most recent trend analyses

and adjusting trigger thresholds if new data or revised WisCALM criteria warrant changes. This adaptive approach ensures the plan remains responsive to evolving conditions while maintaining the long-term monitoring continuity that is the foundation of effective lake management.

15. IMPLEMENTATION STRATEGY

15.1 Key Partners

- Wisconsin DNR: technical assistance, grants, data management
- Lincoln County Land Services Department: technical assistance, cost-share
- Lincoln County Highway Department: road and culvert improvements
- UW-Extension Lakes: training, CBCW coordination
- Lake Steward Program (Ted Rulseh): shoreland practice guidance

15.2 Funding Sources

Source	Amount	Use
DNR Healthy Lakes Grant	Up to \$25,000	Shoreland practices
DNR CBCW Grant	~\$4,000/landing	Watercraft inspections
DNR Surface Water Grant	Up to \$200,000	Plan implementation
Association Funds	Variable	Match, education

15.3 Twenty-Year Maintenance Plan

Appendix B Module 5 of the DNR Surface Water Grant Application Guide requires a 20-year maintenance plan for structural practices installed or improved through grant-funded activities. This section describes the long-term maintenance commitments the Association will uphold to protect the investment of public and private funds in lake protection measures. The maintenance plan covers the period from plan adoption (2026) through 2046.

Culvert and Stormwater Infrastructure (County Highway B and Lon Basco Lane)

The four priority culvert locations identified in Section 7.2 require ongoing attention after initial improvements are made. The Association will coordinate with Lincoln County Highway Department and the Town of Harrison to ensure that improved culverts and any installed filtration or sediment control structures are inspected annually in spring (after snowmelt) and after major storm events. Sediment traps or basins will be cleaned when accumulated sediment reaches 50% of design capacity. Vegetation established at culvert outlets for erosion control will be monitored annually and replanted as needed during the first three years after installation. Long-term maintenance responsibility for road infrastructure rests with Lincoln County and the Town of Harrison, but the Association will serve as the monitoring and reporting partner, documenting conditions

and alerting the responsible agencies when maintenance is needed. Estimated annual Association cost: volunteer inspection time (10–15 hours) plus \$200–500 for minor vegetation maintenance materials.

Healthy Lakes Best Management Practices

The Healthy Lakes program requires that participating property owners maintain installed practices for a minimum of 10 years following grant-funded installation. The Association’s goal of 20 or more participating properties (Section 12, Goal 1) will create a distributed network of shoreland practices that collectively reduce nutrient and sediment loading. Maintenance requirements vary by practice type:

Native Plantings (350+ sq ft gardens). Years 1–3: weeding 2–3 times per growing season, watering during drought, replacing plants that fail to establish. Years 4–10: annual weeding, removal of woody invasives, periodic division of overgrown plants. Years 11–20: minimal maintenance once established; periodic invasive species removal and gap replanting as needed. Property owners are the primary maintainers, with Association support through annual “garden check” visits by trained volunteers.

Rain Gardens. Annual inspection of inlet and overflow areas for erosion or clogging. Sediment accumulation at inlets should be removed when it begins to restrict flow. Plants maintained on the same schedule as native plantings above. If infiltration rate declines noticeably (standing water persists more than 48 hours after rain), the rain garden may need to be excavated and amended with fresh compost and sand mix. Expected lifespan before major renovation: 15–20 years.

Diversions and Rock Infiltration Trenches. Annual inspection for erosion, settling, or blockage. Rock infiltration trenches should be inspected for sediment accumulation and cleaned or topped with additional stone when infiltration capacity diminishes. Diversion channels should be checked for vegetation establishment and erosion after major storms. Expected functional lifespan: 20+ years with periodic maintenance.

Fish Sticks (woody habitat structures). Anchoring cables or hardware should be inspected annually in spring after ice-out. Structures that have shifted or broken free should be re-secured or replaced. As trees decompose over 10–20 years, additional woody material may need to be added to maintain habitat value. Fish stick installations are typically low-maintenance after the initial installation year.

Water Quality Monitoring Equipment

The Secchi disk, sampling bottles, and ice-packing supplies used for CLMN monitoring require minimal maintenance but periodic replacement. The dissolved oxygen meter identified as a priority equipment need (Section 14.2) will require annual calibration and sensor replacement approximately every 3–5 years (estimated cost: \$100–200 per sensor). The Association will budget \$300–500 annually for monitoring equipment

maintenance and replacement to ensure uninterrupted data collection. Over the 20-year plan period, one or two full meter replacements should be anticipated (estimated \$500–1,500 each depending on model).

AIS Prevention Infrastructure

If a Clean Boats, Clean Waters program is established at the County Highway B boat landing, any installed signage, boot brush stations, or informational kiosks will require annual inspection and maintenance. Signs exposed to weather typically need replacement every 5–10 years. Boot brush stations need annual bristle replacement and hardware inspection. The Association will incorporate these items into its annual spring preparation activities. Estimated annual cost: \$100–300 for materials plus volunteer labor.

Long-Term Funding Commitment

The Association’s current financial position (Section 16) demonstrates the capacity to sustain these maintenance commitments. With \$48,695 in assets, 219 member households contributing annual dues, and a 40-year track record of continuous operation, the Association has both the financial resources and organizational stability to support a 20-year maintenance commitment. Total estimated annual maintenance budget across all practice categories is \$1,000–2,000, well within the Association’s current operating capacity. The Association will establish a dedicated “Lake Improvement Maintenance” line item in its annual budget to ensure maintenance funding is tracked and available. At each 5-year plan update, the maintenance plan will be reviewed and adjusted based on actual conditions and any new practices installed during the intervening period.

16. ORGANIZATIONAL CAPACITY AND TRACK RECORD

16.1 Organization History and Governance

History

The Long and Bass Lake Association was founded in 1985 by a group of concerned property owners committed to preserving the quality of these pristine northern Wisconsin lakes. For 40 years, the Association has served as the primary steward of Long Lake and Bass Lake, building a legacy of volunteer commitment, community engagement, and proactive lake management.

In 2025, the Association incorporated as a Qualified Lake Association under Wisconsin Statutes Chapter 33.235, enabling it to apply for Wisconsin DNR Surface Water Grants and strengthening its capacity for formal lake management activities.

Governance Structure

The Association is governed by a volunteer Board of Directors elected by the membership at the Annual Meeting. The Board meets approximately three times per year to oversee Association activities, manage finances, and guide strategic direction.

Board Composition:

- President
- Vice President
- Secretary
- Treasurer
- Directors-at-Large

Standing Committees:

- Financial Management/Grant Management
- Membership & Education
- Activities & Entertainment
- Lake & Fish Management
- Government & Organizations

Members are invited to serve on committees through the annual membership application, ensuring broad participation in Association activities.

Membership

Item	Value
Current membership	219 members
Annual dues	\$20 per member
Association email	entireboard@longandbasslakeassociation.com
Website	longandbasslakeassociation.com

Financial Management and Implementation Authority

To ensure efficient implementation of management plan activities, the Board of Directors will adopt a financial management policy that establishes delegated spending authority for officers to approve routine and time-sensitive expenditures within defined thresholds without convening a full board meeting. Expenditures exceeding the delegated threshold require board approval. All expenditures under delegated authority must be documented and reported at the next regular board meeting. For grant-funded activities, the Association will maintain separate ledger accounts and follow generally accepted accounting principles as required by DNR grant administration guidelines. The Lake & Fish Management Committee and Financial Management/Grant Management

Committee will coordinate to ensure that implementation spending aligns with approved project scopes and budgets.

16.2 Community Engagement Programs

The Association maintains an active calendar of events designed to build community, foster stewardship, and connect residents with their lakes.

Annual Events

Teach a Kid to Fish

- When: Second Saturday of August
- Description: Youth fishing event with prizes and lunch, introducing the next generation to fishing and lake stewardship
- Participation: Open to all children in the lake community
- Funding: Member donations and Association funds

Annual Pontoon Parade & Lake Social

- When: Third Saturday of August
- Description: Decorated boat parade followed by a community potluck dinner with live music
- Participation: Typically 50+ households participate
- Highlights: 1st, 2nd, and 3rd place prizes for best-decorated pontoons; live band entertainment

Annual Membership Meeting

- When: May (typically third Saturday)
- Location: Harrison Town Hall
- Attendance: Approximately 50 members
- Purpose: Election of officers, budget approval, Association business, guest speakers on lake topics

Monthly Lake Dinners

- When: Third Wednesday of each month
- Description: Informal social gatherings at local restaurants
- Purpose: Year-round community building and information sharing

Member Services

Table and Chair Rental Program

- 20 tables and 100 chairs available for member events
- Supports community gatherings and private functions

Private Facebook Group

- Available to paid members
- Platform for sharing lake news, wildlife sightings, and community announcements

Rental Property Education Packets

- Approximately 6 short-term rental properties receive educational materials
- Packets include information on lake etiquette, boating laws, AIS prevention, and no-wake guidelines
- Delivered by Board members to ensure guests understand lake stewardship

Pontoon-to-Pantry Program

- Community food drive initiative
- Demonstrates Association commitment to broader community welfare

16.3 Lake Stewardship Activities

Water Quality Monitoring Program

The Association supports one of the most comprehensive long-term water quality monitoring programs among lakes of this size in Wisconsin.

Metric	Value
Years of monitoring data	52 years (Long Lake: 1973–2025; Bass Lake: 1979 - 2025)
Total Secchi readings	486 (123 Long Lake + 363 Bass Lake)
Total phosphorus samples	195 (84 Long Lake + 111 Bass Lake)
Total chlorophyll-a samples	138 (56 Long Lake + 82 Bass Lake)
Current volunteer monitor	Mark Smallish
Estimated annual volunteer hours	40 hours

Current Monitoring Activities:

- Secchi disk readings (water clarity): 8 times per summer
- Temperature and dissolved oxygen profiles: monthly during summer
- Visual observations and lake condition assessment
- Ice-on and ice-off date tracking

Data Management:

- Data entered into Wisconsin DNR SWIMS database
- Trend analysis performed using DNR Water Explorer tools
- Results shared with membership and inform management decisions

Education and Outreach

Wisconsin Lakes & Rivers Convention

- Association representatives attend the annual statewide conference
- Brings back best practices and networking connections
- Mark and Dawn Smallish attended in 2022, 2023 and 2024

Six County Lake Conference

- Mark and Dawn attended 2022, 2023, 2024 and 2025
- Scott and Roger attended 2025

Website Resources

- Links to DNR water quality data
- Healthy Lakes program information
- Boating laws and regulations
- AIS identification and prevention
- DNR violation hotline information

High Water Advisory Program

- Association issues courtesy "no wake" advisories during high water events
- Protects shorelines from erosion during vulnerable periods

Road Sign Program

- Assists residents with property signage
- Supports emergency response and property identification

16.4 Historical Stewardship Investments

The Association has a proven track record of investing in lake health and habitat.

Fishery Enhancement Program

Fish Stocking History

The lakes have benefited from over 50 years of fish stocking, primarily funded by the Wisconsin DNR.

Lake	Period	Species	Source	Fish Stocked
Bass Lake	1987-1999	Brown/Brook Trout	DNR	81,350
Bass Lake	1999-2001	Walleye	Unknown	3,800
Bass Lake	1972	Muskellunge	DNR	170
Long Lake	2005-2024	Walleye	Association	9,873
Long Lake	2001-2003	Walleye	DNR	2,485

Long Lake	1972	Muskellunge	DNR	275
Total				97,953

Association Investment: The Association funded walleye stocking into Long Lake from 2005-2024, with 8 stocking events over 19 years. Documented costs for 2019-2024 total \$10,815; earlier costs were not recorded but estimated total investment is \$25,000-\$30,000.

In May 2025, the membership voted to discontinue the stocking program based on:

- Concerns about walleye predation on panfish and baitfish populations
- High cost relative to uncertain benefits in clear-water lakes
- Preference to allow natural fishery dynamics

This decision demonstrates the Association's commitment to adaptive management based on community input and scientific considerations.

Walleye Spawning Rock Structures

- Rock substrate installed to support natural walleye reproduction
- Provides long-term spawning habitat without ongoing stocking costs

Wildlife Habitat Support

Loon Nesting Platforms

- Floating nesting platforms installed and maintained
- Supports Common Loon breeding success
- Loons are a valued indicator species of lake health

Environmental Protection Decisions

Fireworks Discontinuation

- Association discontinued fireworks displays
- Decision based on environmental concerns (debris, wildlife disturbance)
- Demonstrates willingness to prioritize lake health over tradition

Wake Enhancement Awareness

- Association advocates for responsible boating practices
- Educational outreach on wake impacts to shorelines and aquatic habitat

Infrastructure Improvements

Culvert Filtration Enhancement

- Ongoing collaboration with Lincoln County to improve road culvert filtration

- Targets sediment and nutrient reduction entering the lakes
- Focus areas: County Highway B and Lon Basco Lane

Boat Landing Maintenance

- Association maintains the public boat landing on Long Lake
- AIS signage installed and maintained
- Landing kept accessible for recreational use and monitoring access

16.5 Volunteer Contributions

The Association operates entirely through volunteer effort. The following table estimates annual volunteer contributions:

Activity	Volunteers	Events	Hours Each	Total Hours
Water quality monitoring	1	Ongoing	36	36
Board meetings	6	3	2	36
Event committees	12	3	2	72
Teach a Kid to Fish	10	1	6	60
Pontoon Parade & Social	15	1	8	120
Monthly dinners coordination	2	10	2	40
Annual meeting	8	1	4	32
Rental packet delivery	1	2	3	6
Website/communications	2	Ongoing	20	40
General lake stewardship	Various	Ongoing	â€”	50
TOTAL				~500 hours

Estimated Value of Volunteer Contributions:

Using the Independent Sector's 2024 value of volunteer time (\$31.80/hour for Wisconsin):

Metric	Hours	Value
Annual volunteer hours	500	\$15,900

40-year cumulative contribution (est.)	20,000	\$636,000
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Note: Cumulative value is illustrative, based on historical volunteer rates adjusted for inflation.

16.6 Financial Capacity

The Long and Bass Lake Association maintains strong financial health, enabling it to support lake management initiatives, provide grant match funding, and sustain operations for the long term.

Current Financial Position (September 2025)

Account	Balance	Notes
Checking Account	\$12,835.84	Operating funds
Certificate of Deposit #1	\$10,415.33	Matures April 18, 2026 (3.5% APY)
Certificate of Deposit #2	\$10,528.73	Matures February 10, 2026 (4.0% APY)
Certificate of Deposit #3	\$14,915.32	Matures February 23, 2026 (4.0% APY)
TOTAL ASSETS	\$48,695.22	

Grant Match Capacity

Wisconsin DNR Surface Water Grants typically require a 25% local match. The Association's current reserves provide match capacity for significant grant projects:

Grant Amount	Required Match	Status
\$25,000 (Healthy Lakes)	\$6,250	✓ Fully capable
\$50,000	\$12,500	✓ Fully capable
\$100,000	\$25,000	✓ Fully capable
\$150,000	\$37,500	✓ Fully capable
\$194,780 (maximum)	\$48,695	✓ At capacity

The timing of CD maturities (February - April 2026) aligns well with grant application and project initiation cycles.

Annual Revenue and Expenses

2025 Revenue (through September)

Category	Amount
Membership dues	\$6,490
Donations	\$820
Total Revenue	\$7,310

2025 Expenses (through September)

Category	Amount	Notes
Legal/Incorporation	\$1,035	Qualified Lake Association status
Annual Social Event	\$3,682	Band, catering, facilities
Teach a Kid to Fish	~\$400	Prizes, food, supplies
Insurance	~\$400	Annual liability coverage
Administrative	~\$780	Printing, mailings, supplies, signage
Other	~\$280	Miscellaneous
Total Expenses	~\$6,577	

Net Operating Result: Approximately +\$733 (revenue exceeding expenses)

Designated Donation Categories

The Association's membership form includes designated donation options, demonstrating member willingness to fund specific initiatives:

- Teach a Kid to Fish
- Educational Programs
- Band and Pontoon Party
- Lake Improvement & Protection Projects
- Pontoon-to-Pantry
- Other designated gifts

The "Lake Improvement & Protection Projects" category directly supports activities aligned with this Lake Management Plan.

Financial Management

- Fiscal year: Calendar year (January - December)
- Financial oversight: Treasurer with Board review
- Payment options: Check or PayPal for member convenience
- Reserves policy: CDs held for long-term stability and grant readiness

16.7 Partnerships and Collaboration

The Association maintains productive relationships with agencies and organizations essential to lake management success.

Current Partners

Partner	Role
Wisconsin DNR	Water quality monitoring support, fisheries management, AIS prevention, grant programs

Lincoln County Land Services Department	Technical assistance, culvert improvements, conservation practices (Tom Boisvert)
UW-Extension Lakes Program	Training, education resources, Clean Boats Clean Waters coordination
Lake Steward Program	Shoreland practice guidance (Ted Rulseh)
Citizen Lake Monitoring Network (CLMN)	Volunteer monitoring protocols, data management, statewide educator support

Regional Networks

Organization	Role
Wisconsin Lakes	Statewide advocacy, annual convention, resources
Six County Lakes & Rivers Association	Regional networking and information sharing
Oneida County Lakes & Rivers Association (OCLRA)	Neighboring county coordination
Vilas County Lakes & Rivers Association (VCLRA)	Neighboring county coordination

Agency Contacts

Agency	Contact	Role
Lincoln County Land Services Department	Tom Boisvert, 715-539-1087	Conservation practices, technical assistance
Lake Steward Program	Ted Rulseh	Healthy Lakes site assessments
WI DNR Lakes Program	DNRLakeb@Wisconsin.gov	Monitoring stations, technical support
WI DNR Surface Water Grants	DNRSurfaceWaterGrants@wisconsin.gov	Grant applications
WI DNR Wisconsin Lakes	Jill L Sunderland, jill.sunderland@wisconsin.gov	Environmental Grants Specialist
WI DNR	Scott Van Egeren	Lake Biologist

16.8 Organizational Capacity Summary

The Long and Bass Lake Association demonstrates the organizational capacity to successfully implement this Lake Management Plan:

Capability	Evidence
DNR Grant Experience	Successful past grants (1995, 2001)
Longevity	40 years of continuous operation (1985 - 2025)

Legal standing	Incorporated as Qualified Lake Association (2025)
Governance	Elected Board, standing committees, annual meetings
Membership	219 member households; \$20 annual dues
Financial strength	\$48,695 in reserves; consistent annual revenue
Grant readiness	Capacity to match grants up to ~\$195,000
Volunteer base	~500 hours annually; 52 years of monitoring
Scientific foundation	52 years of water quality data; trend analysis
Community engagement	Active event calendar; education programs
Stewardship track record	~\$25,000-30,000 invested in fishery; habitat projects
Partnerships	Strong relationships with DNR, County, UW-Extension

Past DNR Grant History

The Association has a proven track record of successfully working with the Wisconsin DNR on lake management projects:

Year	Project	Status
1995	Long and Bass Lake Planning Grant	Completed
2001	Long/Bass Lake Feasibility Study	Completed
2001	Fish Propagation Actions	Completed

This history demonstrates the Association's ability to apply for, manage, and successfully complete DNR-funded projects—a key consideration for future grant applications.

Commitment Statement

The Long and Bass Lake Association is fully committed to implementing this Lake Management Plan. Our 40-year history demonstrates sustained dedication to these lakes. Our financial reserves ensure we can provide required grant matches. Our volunteer base provides the human capacity to execute projects. Our partnerships provide technical expertise and support.

We are prepared to:

- Apply for and manage DNR Surface Water Grants

- Coordinate Healthy Lakes practice installations on member properties
- Implement Clean Boats, Clean Waters watercraft inspection programs
- Continue and expand water quality monitoring
- Conduct community education and outreach
- Report progress annually to membership and partners
- Adapt our approach based on monitoring results

The lakes are in good condition today because of 40 years of stewardship. This plan ensures that commitment continues for the next generation.

Section prepared January 2026. Financial data as of September 28, 2025.

17. APPENDICES

Appendix A: Water Quality Data

A.1 Wisconsin DNR Trophic Status Trend Reports

The following reports were generated from the Wisconsin Water Explorer (WEx) using data from the Surface Water Integrated Monitoring System (SWIMS). These official DNR reports document long-term water quality trends based on volunteer monitoring through the Citizen Lake Monitoring Network.

Long Lake Trophic Status Trend Report

Station: Long Lake - Deep Hole (Station ID: 353122)

WBIC: 1001000

Period of Record: 1973-2025 (52 years)

Report Generated: January 21, 2026

Parameter	Years of Data	Samples	Key Finding
Secchi Depth	52	123	No significant trends - STABLE
Total Phosphorus	52	84	Early summer increasing (p=0.013)
Chlorophyll- α	28	56	Early summer increasing (p=0.039)

Full 7-page report follows

Trophic Status Trend Report for Long Lake - Deep Hole

Waterbody Name: Long Lake
WBIC: 1001000
County: Lincoln
Station ID: 353122

Downloaded on 2026-01-21
Starting Year for trend analysis: 1973
Ending Year for trend analysis: 2025

About this report

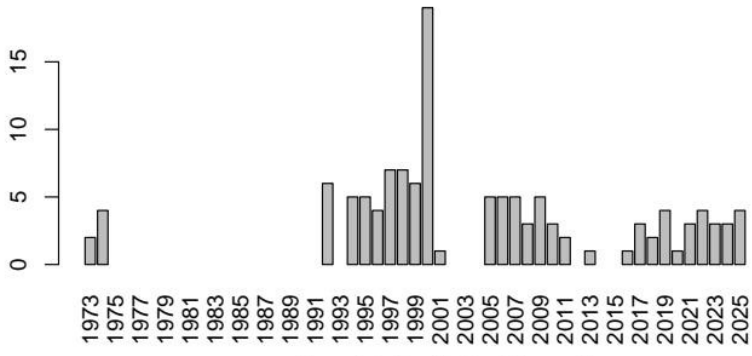
This trend report is automatically produced from data found in the Surface Water Integrated Monitoring System (SWIMS). In most cases, trend analysis should be carried out on "deep hole" stations - located at roughly the deepest point in the lake or the point considered to be representative of whole-lake conditions.

Total phosphorus and chlorophyll- α collected from more than 7 feet below the surface are excluded. Other samples are grouped by season and then averaged. Trends are then estimated for each season with at least 10 years of data. Kendall's tau is used to test for the presence of a trend, and the slope estimate is the Theil-Sen line. Both methods are appropriate for non-normal data, but may fail to detect the presence of a non-monotonic trend (like a U-shaped curve or more complex behavior).

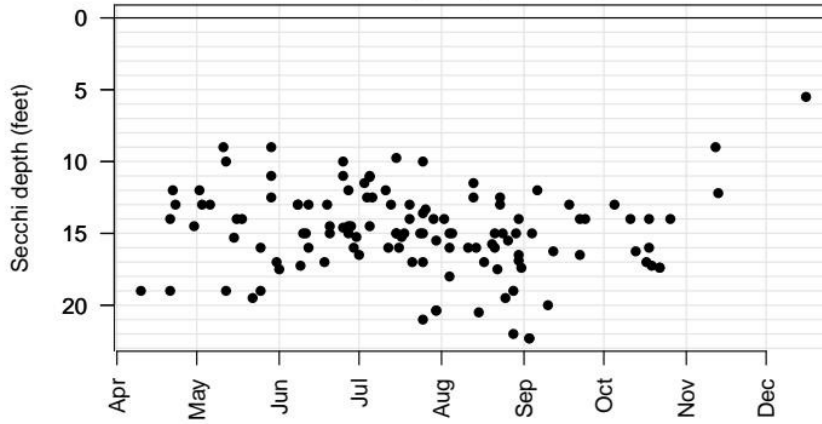
Secchi Depth

No. of Secchi readings: 123

Count of Secchi depth readings by year

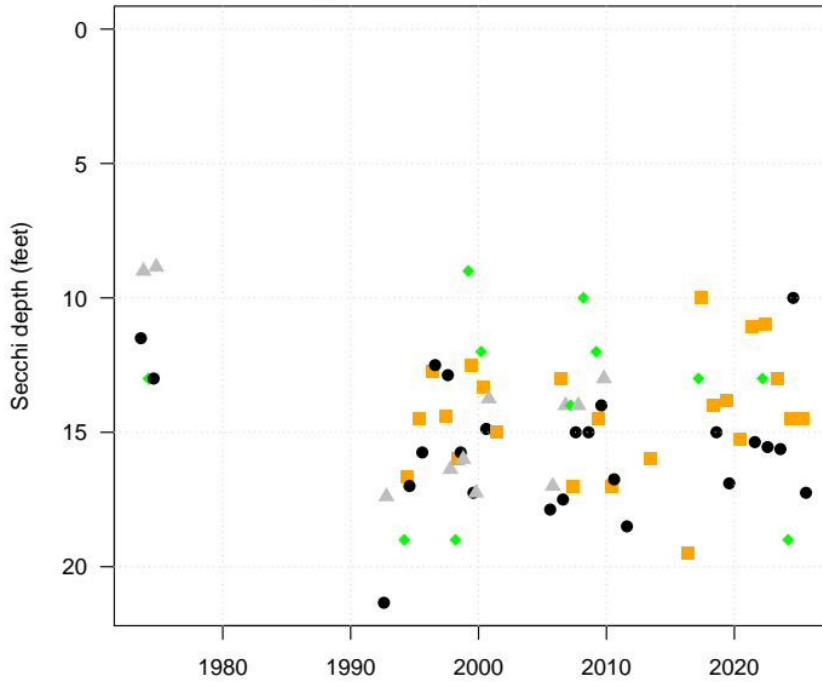


Secchi depth by time of year



```
## Warning: 'xfun::attr()' is deprecated.  
## Use 'xfun::attr2()' instead.  
## See help("Deprecated")
```

Long Lake – Deep Hole – 353122



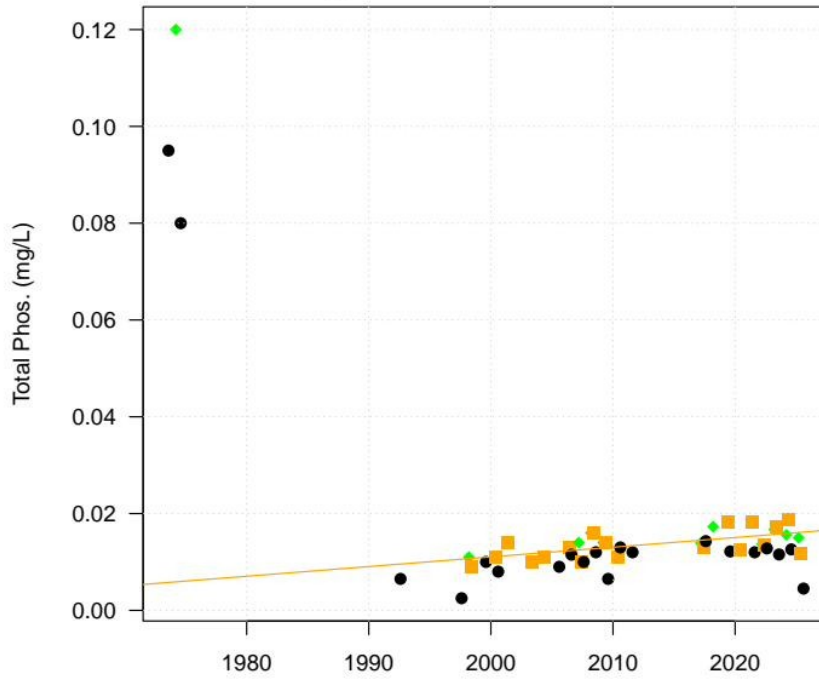
◆ spring (Jan 01 – May 14)
■ early summer (May 15 – Jul 14)
● late summer (Jul 15 – Sep 14)
▲ fall (Sep 15 – Dec 31)
 solid lines appear if there is a trend over time
 points represent seasonal averages

```

## Warning: 'xfun::attr()' is deprecated.
## Use 'xfun::attr2()' instead.
## See help("Deprecated")
  
```

season	no. years	no. results	slope low ci	slope estimate	slope upper ci	intercept	p-value
spring	12	12	-0.167	0.014	0.214	-14.882	0.675
early_summer	23	41	-0.135	-0.042	0.062	98.250	0.474
late_summer	24	53	-0.069	0.032	0.103	-47.909	0.551
fall	11	17	-0.273	-0.030	0.177	73.732	0.815

Long Lake – Deep Hole – 353122



◆ spring (Jan 01 – May 14)
■ early summer (May 15 – Jul 14)
● late summer (Jul 15 – Sep 14)
 solid lines appear if there is a trend over time
 points represent seasonal averages

```

## Warning: 'xfun::attr()' is deprecated.
## Use 'xfun::attr2()' instead.
## See help("Deprecated")
  
```

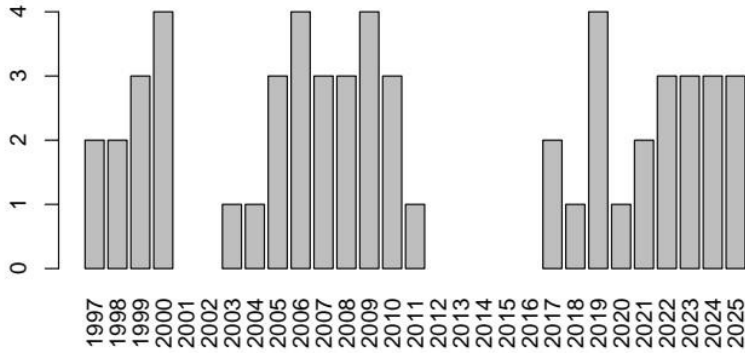
season	no. years	no. results	slope low ci	slope estimate	slope upper ci	intercept	p-value
spring	11	12	-0.00061	0e+00	0.00019	0.01500	1.00000
early_summer	18	19	0.00005	2e-04	0.00035	-0.38895	0.01343
late_summer	20	39	-0.00022	6e-05	0.00021	-0.11445	0.47405

Chlorophyll- α

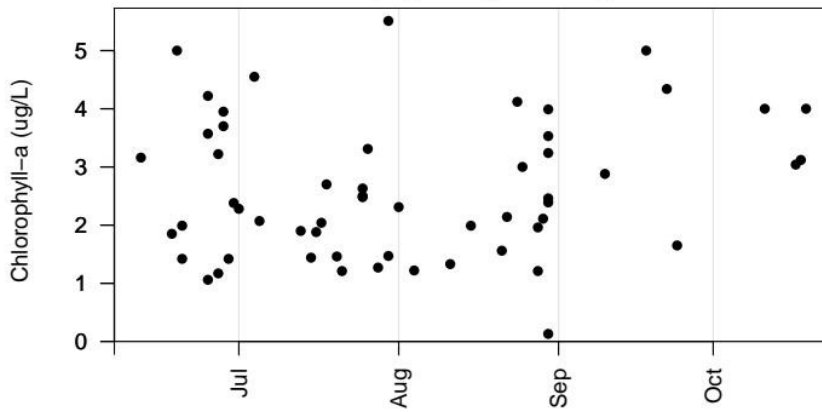
No. of chlorophyll- α samples: 56

1 non-detects (2%) substituted for 1/2 the reported detection limit.

Count of Total Chlorophyll- α readings by year

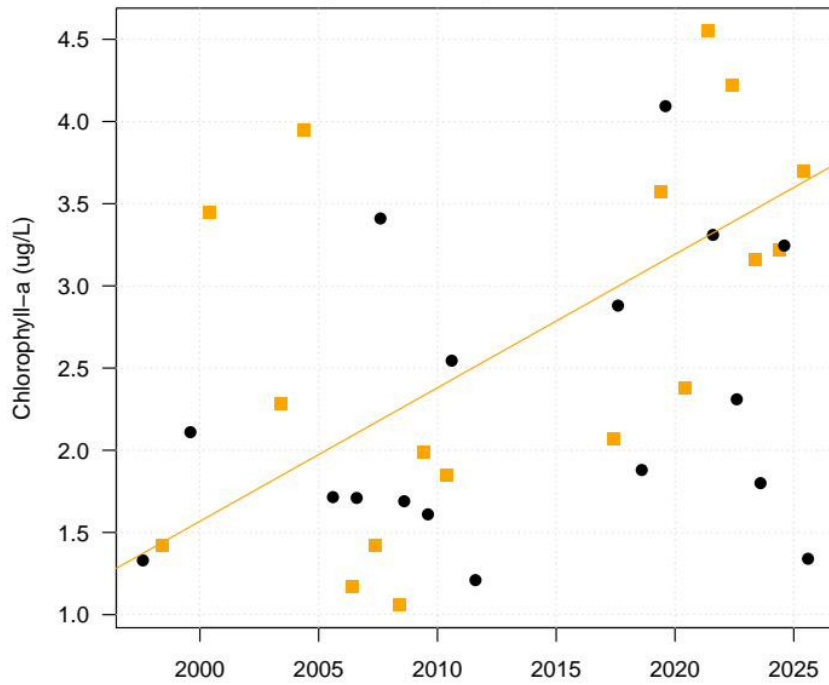


Chlorophyll-a by time of year



```
## Warning: 'xfun::attr()' is deprecated.  
## Use 'xfun::attr2()' instead.  
## See help("Deprecated")
```

Long Lake – Deep Hole – 353122



■ early summer (May 15 – Jul 14)
● late summer (Jul 15 – Sep 14)
 solid lines appear if there is a trend over time
 points represent seasonal averages

```

## Warning: 'xfun::attr()' is deprecated.
## Use 'xfun::attr2()' instead.
## See help("Deprecated")
  
```

season	no. years	no. results	slope low ci	slope estimate	slope upper ci	intercept	p-value
early_summer	17	19	0.0060	0.0812	0.1358	-160.8754	0.0393
late_summer	17	39	-0.0214	0.0185	0.0799	-35.4008	0.4338

WBIC: 969600

Period of Record: 1979-2025 (46 years)

Report Generated: January 21, 2026

Parameter	Years of Data	Samples	Key Finding
Secchi Depth	46	363	Late summer DECLINING ($p=0.010$)
Total Phosphorus	28	111	Early & late summer INCREASING ($p=0.003$, $p=0.0005$)
Chlorophyll- α	28	82	Early & late summer increasing ($p=0.006$, $p=0.018$)

Full 7-page report follows

Trophic Status Trend Report for Bass Lake - Deep Hole

Waterbody Name: Bass Lake

WBIC: 969600

County: Lincoln

Station ID: 353077

Downloaded on 2026-01-21

Starting Year for trend analysis: 1979

Ending Year for trend analysis: 2025

About this report

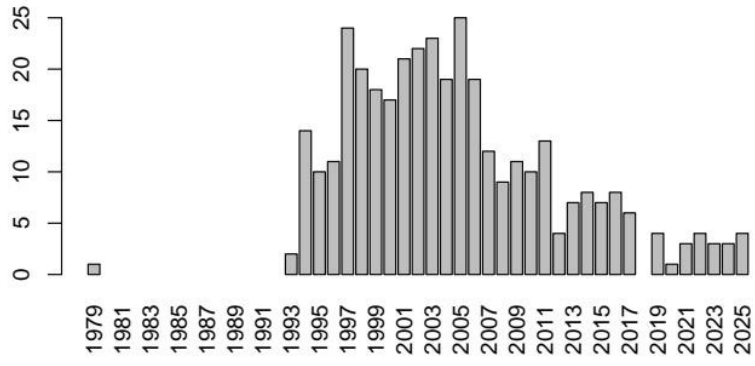
This trend report is automatically produced from data found in the Surface Water Integrated Monitoring System (SWIMS). In most cases, trend analysis should be carried out on "deep hole" stations - located at roughly the deepest point in the lake or the point considered to be representative of whole-lake conditions.

Total phosphorus and chlorophyll- α collected from more than 7 feet below the surface are excluded. Other samples are grouped by season and then averaged. Trends are then estimated for each season with at least 10 years of data. Kendall's tau is used to test for the presence of a trend, and the slope estimate is the Theil-Sen line. Both methods are appropriate for non-normal data, but may fail to detect the presence of a non-monotonic trend (like a U-shaped curve or more complex behavior).

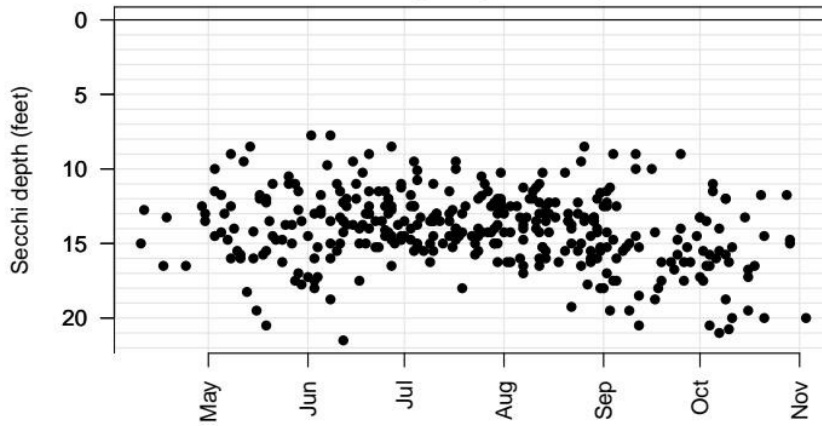
Secchi Depth

No. of Secchi readings: 363

Count of Secchi depth readings by year

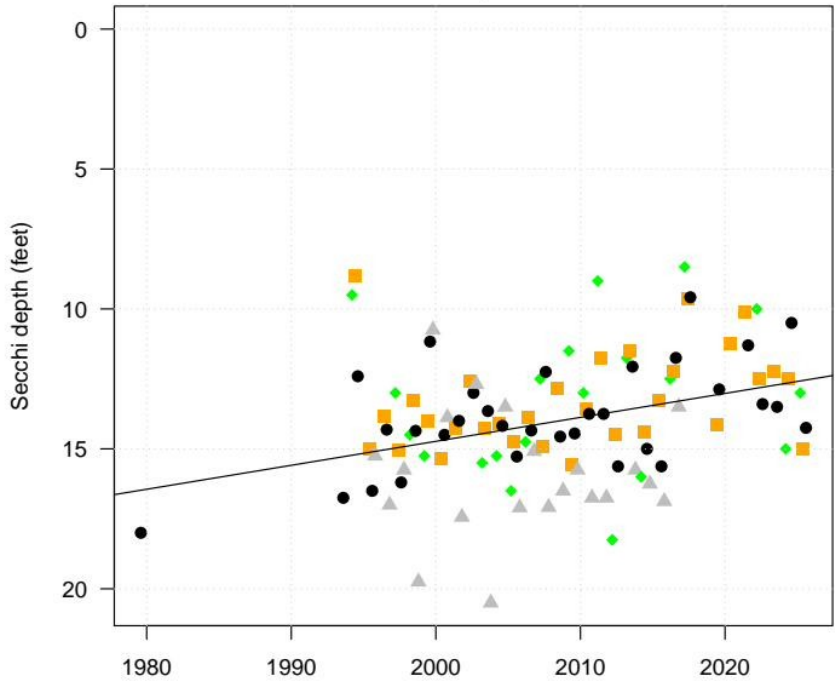


Secchi depth by time of year



```
## Warning: 'xfun::attr()' is deprecated.  
## Use 'xfun::attr2()' instead.  
## See help("Deprecated")
```

Bass Lake – Deep Hole – 353077



◆ spring (Jan 01 – May 14)
■ early summer (May 15 – Jul 14)
● late summer (Jul 15 – Sep 14)
▲ fall (Sep 15 – Dec 31)
 solid lines appear if there is a trend over time
 points represent seasonal averages

```

## Warning: 'xfun::attr()' is deprecated.
## Use 'xfun::attr2()' instead.
## See help("Deprecated")
  
```

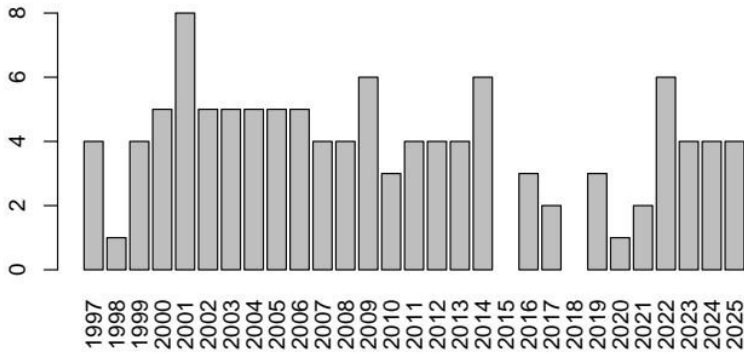
season	no. years	no. results	slope low ci	slope estimate	slope upper ci	intercept	p-value
spring	20	25	-0.250	-0.063	0.114	140.587	0.474
early_summer	31	133	-0.125	-0.073	0.000	160.340	0.057
late_summer	32	152	-0.148	-0.086	-0.026	185.972	0.010
fall	21	53	-0.136	0.000	0.169	16.250	1.000

Total Phosphorus

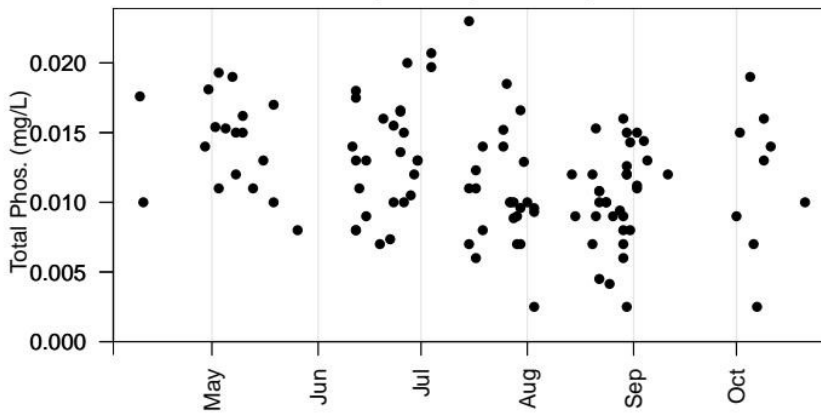
No. of total phosphorus samples: 111

4 non-detects (4%) substituted for 1/2 the reported detection limit.

Count of Total phosphorus readings by year

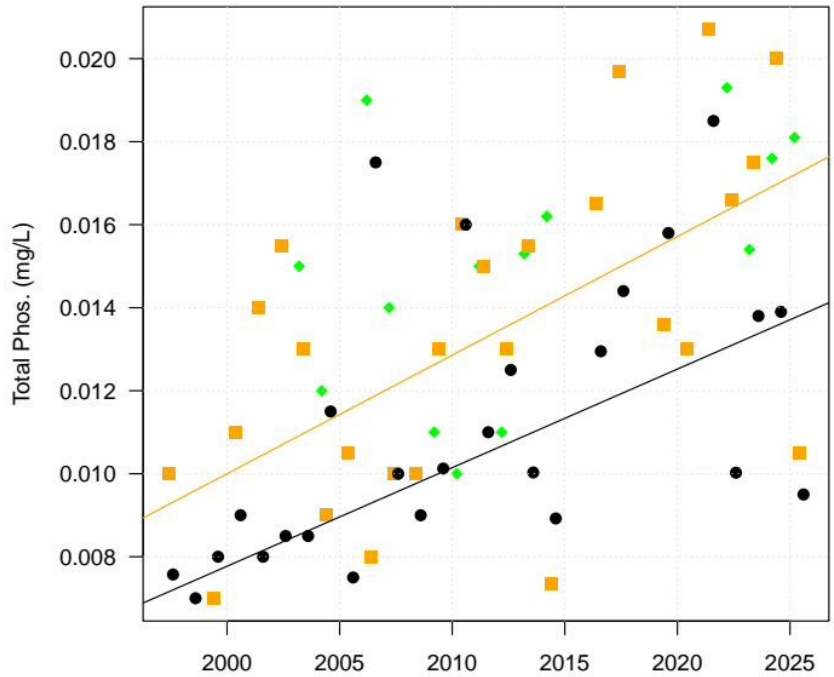


Total phos. by time of year



```
## Warning: 'xfun::attr()' is deprecated.  
## Use 'xfun::attr2()' instead.  
## See help("Deprecated")
```

Bass Lake – Deep Hole – 353077



◆ spring (Jan 01 – May 14)
■ early summer (May 15 – Jul 14)
● late summer (Jul 15 – Sep 14)
 solid lines appear if there is a trend over time
 points represent seasonal averages

```

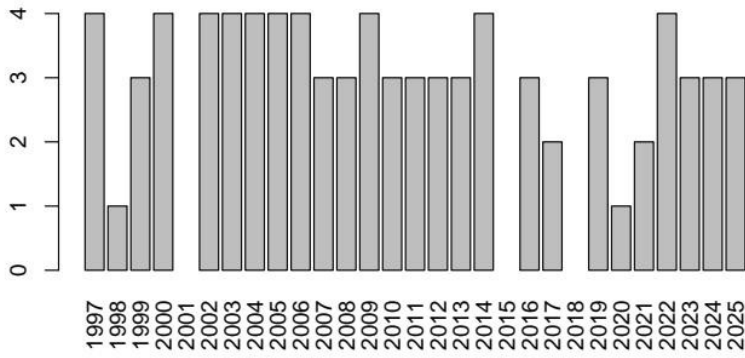
## Warning: 'xfun::attr()' is deprecated.
## Use 'xfun::attr2()' instead.
## See help("Deprecated")
  
```

season	no. years	no. results	slope low ci	slope estimate	slope upper ci	intercept	p-value
spring	14	14	-0.00002	0.00022	0.00042	-0.42067	0.06191
early_summer	26	30	0.00010	0.00029	0.00045	-0.56143	0.00304
late_summer	26	58	0.00011	0.00024	0.00034	-0.46723	0.00053

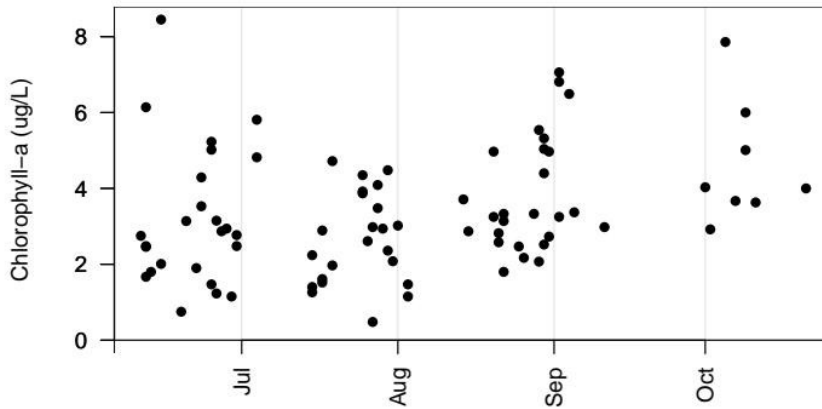
Chlorophyll- α

No. of chlorophyll- α samples: 82

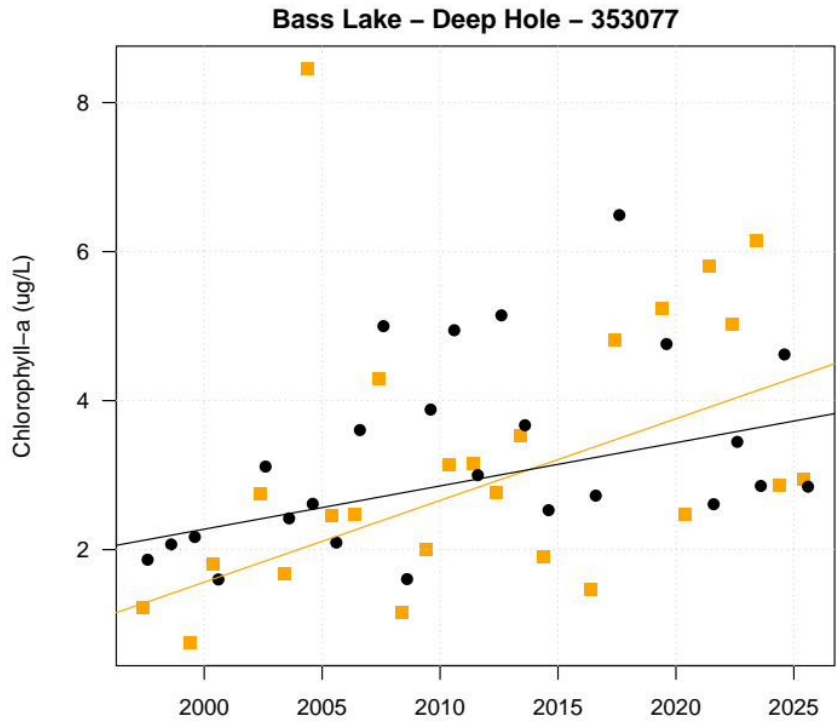
Count of Total Chlorophyll- α readings by year



Chlorophyll-a by time of year



```
## Warning: 'xfun::attr()' is deprecated.  
## Use 'xfun::attr2()' instead.  
## See help("Deprecated")
```



■ early summer (May 15 – Jul 14)
● late summer (Jul 15 – Sep 14)
 solid lines appear if there is a trend over time
 points represent seasonal averages

```

## Warning: 'xfun::attr()' is deprecated.
## Use 'xfun::attr2()' instead.
## See help("Deprecated")
  
```

season	no. years	no. results	slope low ci	slope estimate	slope upper ci	intercept	p-value
early_summer	25	30	0.0343	0.1097	0.1818	-217.8415	0.0058
late_summer	25	58	0.0127	0.0581	0.1225	-113.8367	0.0183

A.2 Data Source Information

Wisconsin Water Explorer (WEX): <https://dnr.wisconsin.gov/topic/Lakes/WEx>

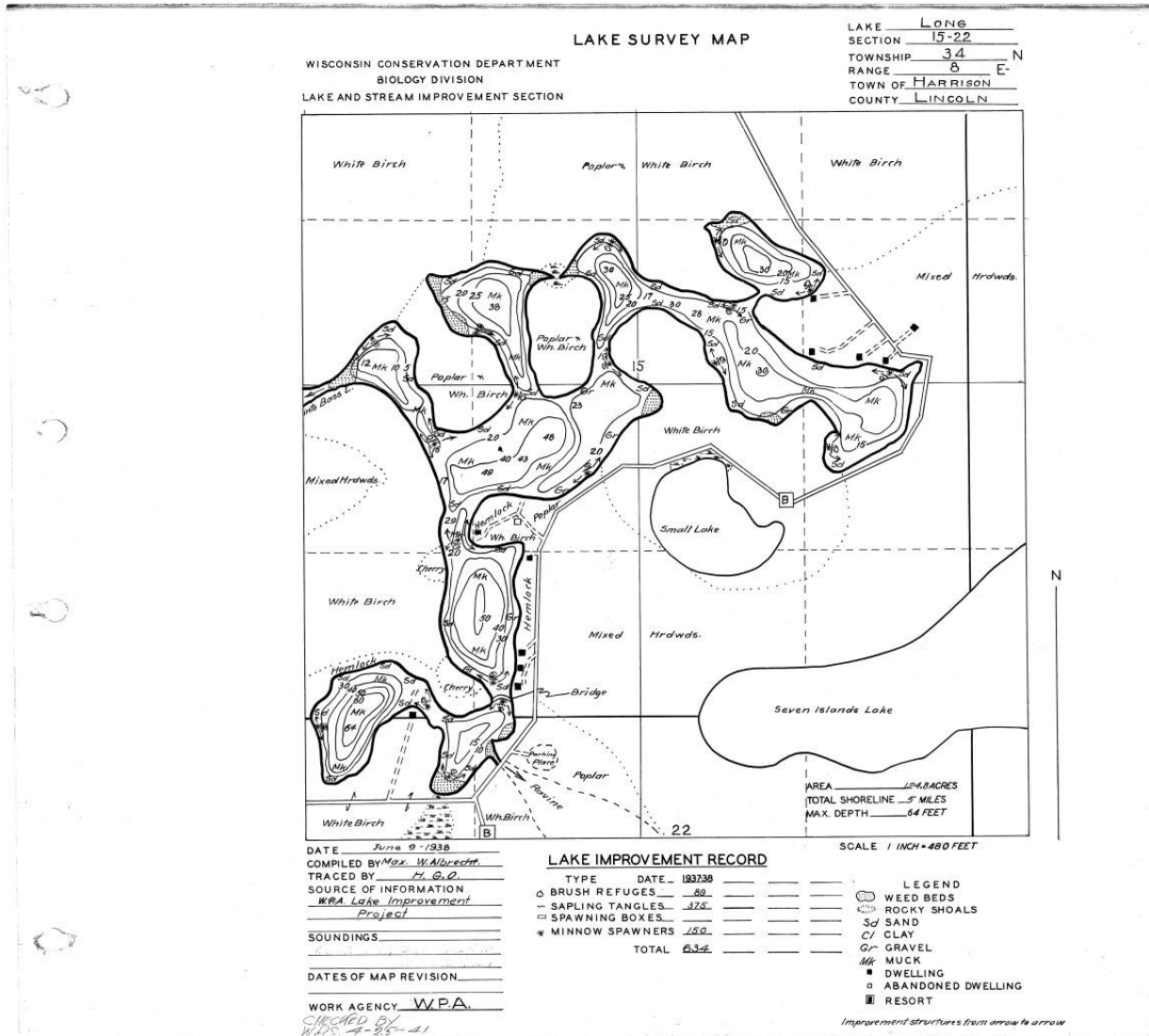
SWIMS Database: Surface Water Integrated Monitoring System maintained by Wisconsin DNR

Methodology: Trends estimated using Kendall's tau test with Theil-Sen slope estimator. Methods are appropriate for non-normal data. A p-value < 0.05 indicates a statistically significant trend.

Appendix B: Bathymetric Maps

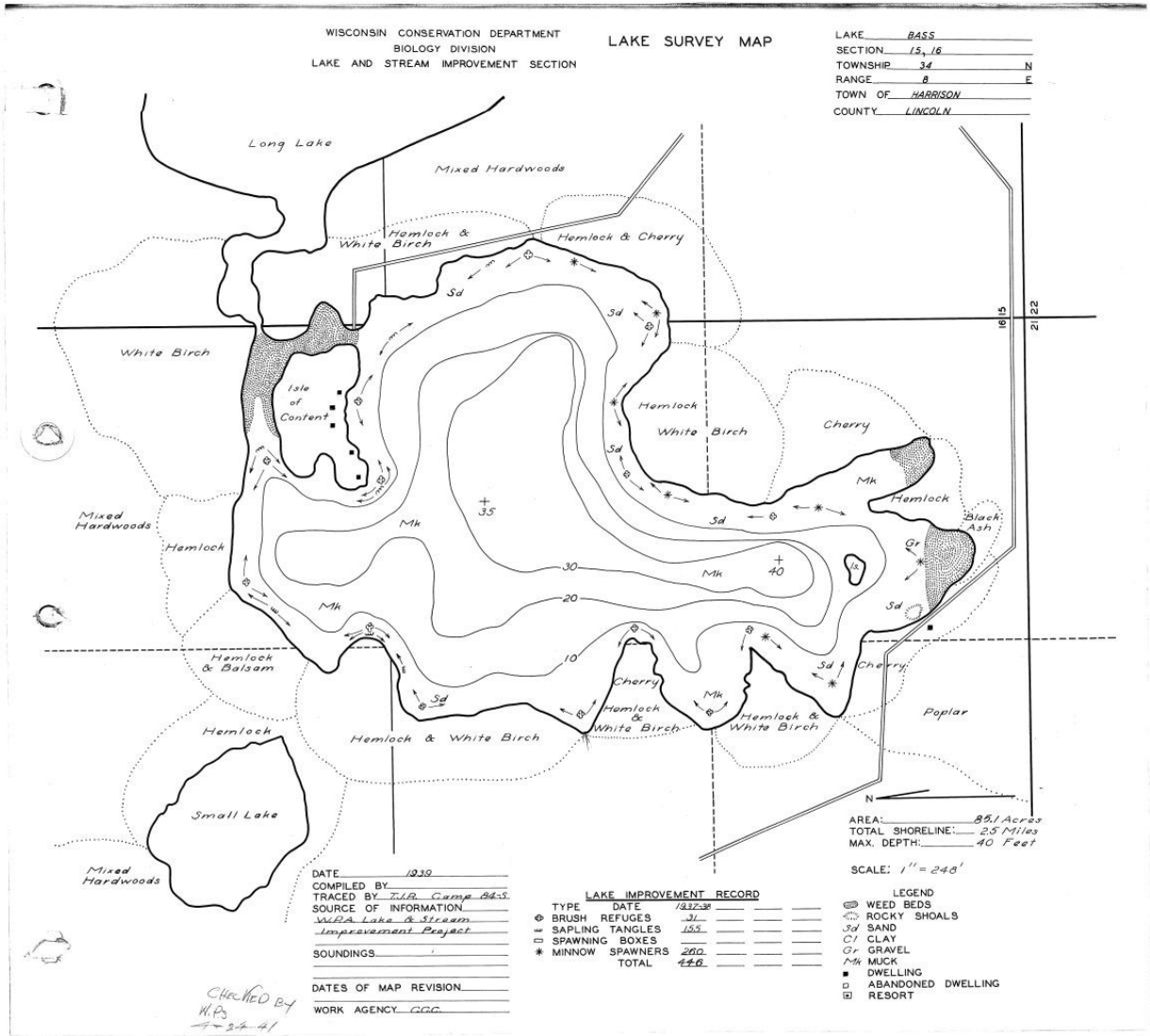
Lake depth contour maps from Wisconsin DNR Lake Maps.

Long Lake (WBIC 1001000)



Source: Wisconsin Department of Natural Resources 608-266-2621
Long Lake (T34N R8E Sec.15,22) - Lincoln County, Wisconsin DNR Lake Map
Date - June 1938 - Historical Lake Map - Not for Navigation
A Public Document - Please Identify the Source when using it.

Bass Lake (WBIC 969600)



Source: Wisconsin Department of Natural Resources 608-266-2621
Bass Lake (T34N R8E Sec15,16) - Lincoln County, Wisconsin DNR Lake Map
Date April 1941 - Historical Lake Map - Not for Navigation
A Public Document - Please Identify the Source when using it.

Appendix C: Member Survey Results

[To be added after survey completion - anticipated Spring 2026]

Long and Bass Lake Association Member Survey

Help Shape Our Lake Management Plan

Purpose: Your input will guide our Comprehensive Lake Management Plan and support grant applications to the Wisconsin DNR for lake protection projects. Your responses are confidential and will be reported only in aggregate.

Deadline: [DATE]

Return options: Online at [URL], by mail to [ADDRESS], or drop off at [LOCATION]

SECTION 1: YOUR PROPERTY

1. Which lake is your property on?

- Long Lake
- Bass Lake
- Both (channel area)
- Neither (within Association area but not lakefront)

2. How do you use your property?

- Year-round residence
- Seasonal/vacation home
- Vacant lot
- Other: _____

3. How long have you owned property here?

- Less than 5 years
- 5–10 years
- 11–20 years
- More than 20 years

4. If lakefront, approximately how many feet of shoreline do you have?

- Less than 100 feet
- 100–200 feet
- 200–300 feet
- More than 300 feet
- Not sure
- N/A – not lakefront

SECTION 2: WHAT YOU VALUE ABOUT THE LAKES

5. How important are the following to you? (1=Not Important, 5=Very Important)

	1	2	3	4	5
Water clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fishing quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Swimming	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wildlife and natural habitat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Peace and quiet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Natural/undeveloped scenery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boating/paddling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Property values	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loons and waterfowl	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. What do you value MOST about Long Lake and Bass Lake? (Select up to 3)

- Clear, clean water
- Good fishing
- Quiet, peaceful atmosphere
- Natural beauty and scenery
- Wildlife
- Family tradition/memories
- Safe swimming
- Small, uncrowded feel
- Other: _____

SECTION 3: YOUR CONCERNS

7. How concerned are you about the following? (1=Not Concerned, 5=Very Concerned)

	1	2	3	4	5	?
Aquatic invasive species (e.g., Eurasian milfoil, zebra mussels)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Declining water clarity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Algae growth	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Shoreline erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sediment runoff from roads/culverts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boat traffic levels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wake boats and large wakes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Septic system impacts	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Declining fish populations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loss of natural shoreline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increasing development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climate change effects on the lake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Lawn chemicals/fertilizers reaching the lake	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Have you observed any of the following problem areas? (Check all that apply)

- Road culverts that discharge sediment into the lake or nearby wetlands
- Shoreline erosion on your property
- Shoreline erosion elsewhere on the lakes
- Stormwater runoff carrying sediment toward the lake
- Algae blooms
- Unusual aquatic plants you don't recognize
- Chinese Mystery Snails (large, round snails with a "trapdoor" — confirmed present in both lakes)
- None observed

9. If you checked any boxes above, please describe the location(s):

10. Which of the following do you practice when bringing watercraft to or from the lakes? (Check all that apply)

- Inspect boat, trailer, and equipment for attached plants and animals
- Remove all attached plants and animals before leaving the landing
- Drain all water from boat, livewell, and bilge
- Dry equipment for at least 5 days before entering another waterbody
- Dispose of unwanted bait in the trash (not in the water)
- I don't bring watercraft to the lakes
- Not familiar with these steps

11. Chinese Mystery Snails have been confirmed present in both Long Lake and Bass Lake. Have you observed them on your property or shoreline?

- Yes, frequently
- Yes, occasionally
- No
- Not sure what they look like

If yes, where have you observed them?

SECTION 4: YOUR PROPERTY PRACTICES (Lakefront owners only)

If you are not a lakefront owner, skip to Section 5.

12. Which of the following describe your shoreline? (Check all that apply)

- Lawn extending to the water's edge
- Natural vegetation buffer (native plants, shrubs, no-mow zone)
- Sandy beach area
- Rock/riprap
- Retaining wall or seawall
- Dock
- Boat lift
- Woody debris (fallen trees/branches in water)

13. Do you use fertilizer on your lawn?

- No
- Yes, phosphorus-free fertilizer
- Yes, regular fertilizer (may contain phosphorus)
- Not sure what type

14. Do you have rain gutters/downspouts on your home?

- Yes, they discharge onto lawn/ground
- Yes, they discharge into a rain garden or infiltration area
- Yes, they connect to underground drainage
- No rain gutters
- Not sure

15. When was your septic system last inspected?

- Within the last 3 years
- 3–5 years ago
- More than 5 years ago
- Never / Don't know
- Connected to holding tank (no septic)

16. Approximately how old is your septic system?

- Less than 10 years
- 10–20 years
- 20–30 years
- More than 30 years
- Don't know

SECTION 5: SUPPORT FOR LAKE PROTECTION ACTIONS

17. How strongly do you support the Association pursuing the following? (1=Do Not Support, 5=Strongly Support)

	1	2	3	4	5	?
Applying for grants to fund lake protection projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Watercraft inspections at the boat landing (Clean Boats, Clean Waters)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Educational programs on lake-friendly practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Working with Lincoln County on culvert improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Encouraging shoreline restoration with native plants	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Installing loon nesting platforms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Monitoring for aquatic invasive species	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Septic system education/inspection programs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Advocating for responsible boating practices	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

18. Large wakes from wake boats and wake-enhancing devices can affect shallow areas, shorelines, and aquatic habitat. Which approach do you most support for managing wake boat activity on these lakes?

- No action needed at this time
- Education and voluntary guidelines (e.g., keep large wakes away from shore and shallow areas)
- Formal voluntary slow-no-wake zones near shorelines
- Pursue a regulatory ordinance through the Town of Harrison and WDNR
- I need more information before deciding

19. The Association can apply for state grants that cover up to 75% of project costs, but a 25% local match is required. How would you feel about the Association supporting grant-matching for lake protection projects through the following? (Check all that apply)

- Use existing Association funds
- Increase annual dues modestly (e.g., \$10–\$25)
- Request voluntary contributions from members for specific projects
- Pursue donations from local businesses or organizations
- I need more information before deciding
- Do not support additional financial commitments

SECTION 6: HEALTHY LAKES PROGRAM INTEREST

The Wisconsin Healthy Lakes & Rivers Program provides grants of up to \$1,000 per practice (75% cost-share) for property owners who install projects that protect water quality. The Association can apply for grants on behalf of multiple property owners.

Eligible practices include:

- Native Plantings — A 350+ sq ft garden of native plants that filters runoff
- Rain Gardens — Shallow planted depressions that capture runoff
- Diversion Practices — Redirect runoff away from the lake
- Rock Infiltration — Gravel trenches that capture and infiltrate runoff
- Fish Sticks — Bundles of trees/branches anchored in water for fish habitat

20. Are you interested in installing any with grant assistance? (Check all that apply)

- Native plantings
- Rain garden
- Diversion/runoff management
- Rock infiltration
- Fish sticks (in-water habitat)
- I'd like to learn more before deciding
- Not interested at this time
- Already have similar practices in place

21. Would you like a free site visit from the Lake Steward Program?

- Yes
- Maybe later
- No

22. What might prevent you from participating? (Check all that apply)

- Cost (even with 75% grant coverage)
- Don't want to change my shoreline
- Unsure what's involved
- Concerned about maintenance
- Rental property / don't make decisions
- Nothing — I'm interested!
- Other: _____

SECTION 7: VOLUNTEER OPPORTUNITIES

23. Would you be willing to volunteer for any of the following? (Check all that apply)

- Clean Boats, Clean Waters inspector — Greet boaters, educate about AIS (training provided; 2–4 hr shifts)
- Aquatic invasive species monitor — Check shoreline areas periodically (training provided)
- Water quality monitoring assistant — Help with Secchi readings or sample collection
- Lake education events — Help organize or host educational programs
- Shoreline planting workdays — Help neighbors install native plantings
- Board or committee participation — Serve on Association board or committees
- Other skills to offer: _____
- Unable to volunteer at this time

SECTION 8: ADDITIONAL INPUT

24. What is your single biggest concern about the future of Long Lake and Bass Lake?

25. Is there anything else you'd like the Association to know as we develop the Lake Management Plan?

CONTACT INFORMATION (Optional)

Providing your contact information helps us follow up on Healthy Lakes interest, volunteer opportunities, and site-specific observations. This information will be kept confidential.

Name _____

Property Address

Email _____

Phone _____

26. How do you prefer to receive Association information? (Check all that apply)

- Email
- U.S. Mail
- Association website
- Facebook/social media
- At the Annual Meeting
- Word of mouth from neighbors

- I'd like to receive Association updates by email
- Please contact me about Healthy Lakes
- Please contact me about volunteer opportunities

Thank you for completing this survey!

Your input is essential to protecting Long Lake and Bass Lake for future generations.

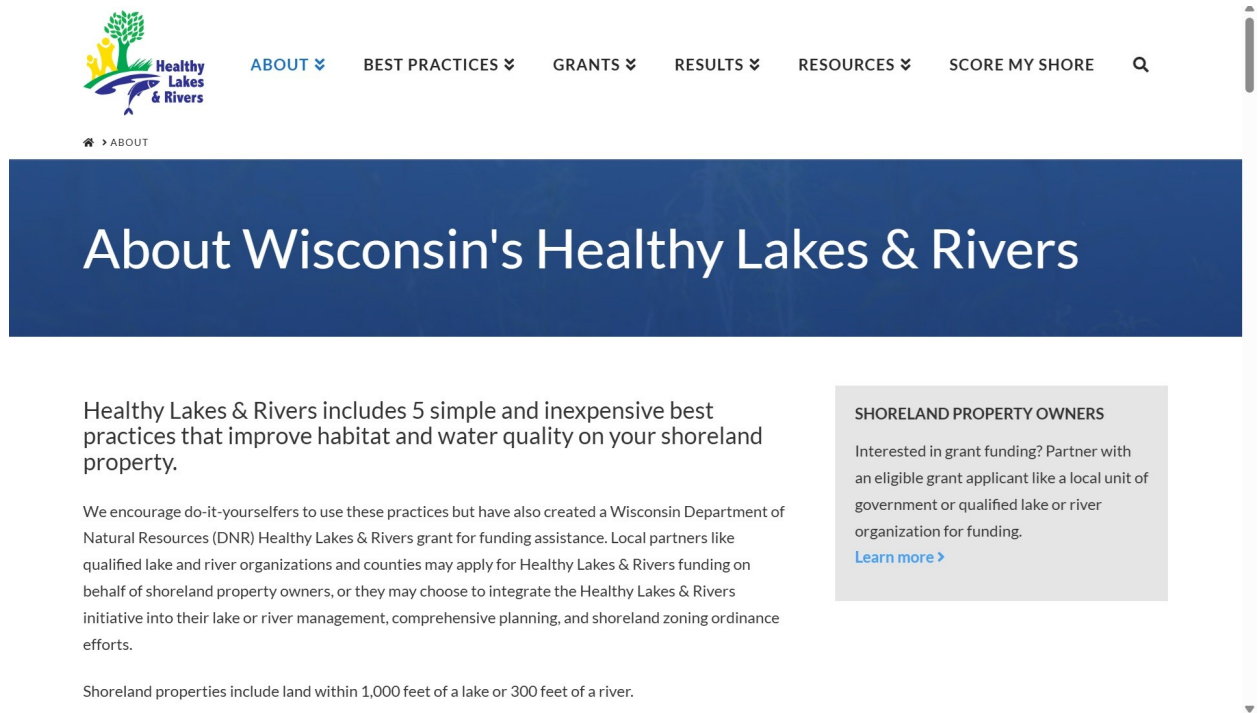
Survey results will be shared at the Annual Meeting in May 2026.

Questions? Contact the Association at entireboard@longandbasslakeassociation.com

Appendix D: Healthy Lakes & Rivers Program

Wisconsin's Healthy Lakes & Rivers program provides grants and technical assistance for shoreland best practices.

Website: <https://healthylakeswi.com>



The screenshot shows the homepage of the Wisconsin Healthy Lakes & Rivers program. At the top left is the logo, which features a stylized tree, a fish, and a sun. To the right of the logo is a navigation menu with the following items: ABOUT, BEST PRACTICES, GRANTS, RESULTS, RESOURCES, and SCORE MY SHORE. A search icon is located to the right of the menu. Below the navigation menu is a dark blue banner with the text "About Wisconsin's Healthy Lakes & Rivers" in white. Underneath the banner, there is a main content area. On the left, there is a paragraph of text: "Healthy Lakes & Rivers includes 5 simple and inexpensive best practices that improve habitat and water quality on your shoreland property." Below this is another paragraph: "We encourage do-it-yourselfers to use these practices but have also created a Wisconsin Department of Natural Resources (DNR) Healthy Lakes & Rivers grant for funding assistance. Local partners like qualified lake and river organizations and counties may apply for Healthy Lakes & Rivers funding on behalf of shoreland property owners, or they may choose to integrate the Healthy Lakes & Rivers initiative into their lake or river management, comprehensive planning, and shoreland zoning ordinance efforts." At the bottom of this section, it says "Shoreland properties include land within 1,000 feet of a lake or 300 feet of a river." On the right side of the main content area, there is a grey box titled "SHORELAND PROPERTY OWNERS" with the text: "Interested in grant funding? Partner with an eligible grant applicant like a local unit of government or qualified lake or river organization for funding." Below this text is a blue link that says "Learn more >".

The program includes five best practices: native plantings, rain gardens, diversion practices, rock infiltration practices, and fish sticks. Property owners within 1,000 feet of a lake are eligible. The Long and Bass Lake Association can apply for grants on behalf of participating property owners.

Appendix E: AIS Monitoring Report (2024)

Lincoln County Land Services Department Aquatic Invasive Species Monitoring Survey

Survey conducted July-August 2024 by Tom Boisvert, AIS Coordinator

LONG & BASS LAKE AIS MONITORING REPORT

Long Lake Water Body Identification Code (WBIC): 1001000
Bass Lake Water Body Identification Code (WBIC): 969600
SWIMS Station ID Long Lake: 10022931
SWIMS Station ID Bass Lake: 10003477



Previously Known AIS: Chinese Mystery Snails
New AIS Findings: None
Field Crew: Sam Coates – AIS LTE, Hayley Djupstrom – AIS LTE
Long Lake Field Dates: July 19th, 2024 & July 22nd, 2024
Bass Lake Field Dates: July 31st, 2024 & August 2nd, 2024

We would like to thank the Smallish family for their generosity of allowing Lincoln County staff the opportunity to use their driveway and waterfront to launch County kayaks on the two monitoring dates for Bass Lake.

Long Lake:

Long Lake is located in Lincoln County, WI and has one public boat landing that is located on County Road B. Long Lake is a 119 acre lake with a maximum depth of 64 feet. The Wisconsin Department of Natural Resources (WDNR) classified the bottom substrate for Long Lake to be composed of 65% Sand, 15% Gravel, 0% Rock, and 20% Muck.

Bass Lake:

Bass Lake is located in Lincoln County, WI and it shares one public boat landing with Long Lake that is located on County Road B. Bass Lake is a 106 acre lake with a maximum depth of 40 feet. The Wisconsin Department of Natural Resources (WDNR) classified the bottom substrate for Bass Lake to be composed of 65% Sand, 14% Gravel, 1% Rock, and 20% Muck.

AIS Surveys:

Lincoln County staff followed all WDNR early detection monitoring protocols and all data was submitted into the Surface Water Integrated Monitoring System (SWIMS) database. Throughout the monitoring process, staff stopped at targeted search sites and completed rake tosses to examine aquatic plants. There were 25 targeted search sites selected on Long/Bass Lakes. The target site locations were all recorded with GPS coordinates, and are illustrated in Figure 2. At each target site visual scanning and the throw rake were utilized extensively. Plants caught on the rake were scanned for any possible AIS. Each targeted search site was surveyed for approximately 20 minutes, or until the area was adequately sampled. In between the targeted search sites a meander survey with visual scanning was conducted along the edge of the lake. Once again, the throw rake was utilized extensively, and plants were examined. There was no adverse weather to impede our survey. Overall, Long/Bass Lakes appeared to be healthy, and no new AIS were observed. These observations remain consistent with the WDNR's reporting of all known AIS on these lakes. The AIS sign that was present was up to date with the current WDNR postings.

Secchi Disk Readings:

Long Lake:

Sample Location Depth: 68 ft.
Secchi Disk Depth: 13.5 ft.

Bass Lake:

Data was not taken due to excessive wind.

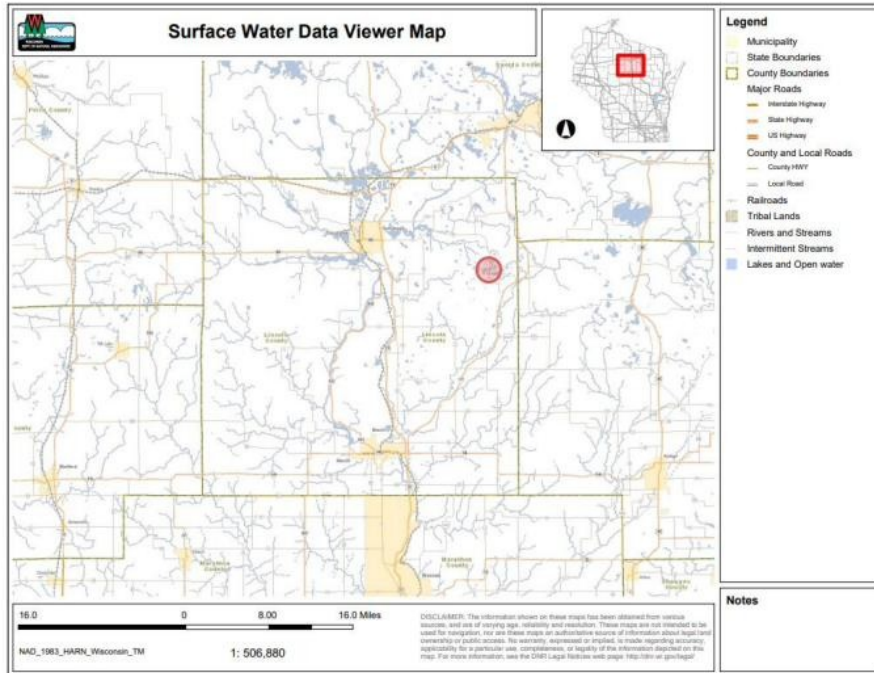


Figure 1: Map of Lincoln County, WI with the location of Long & Bass Lake circled in red.

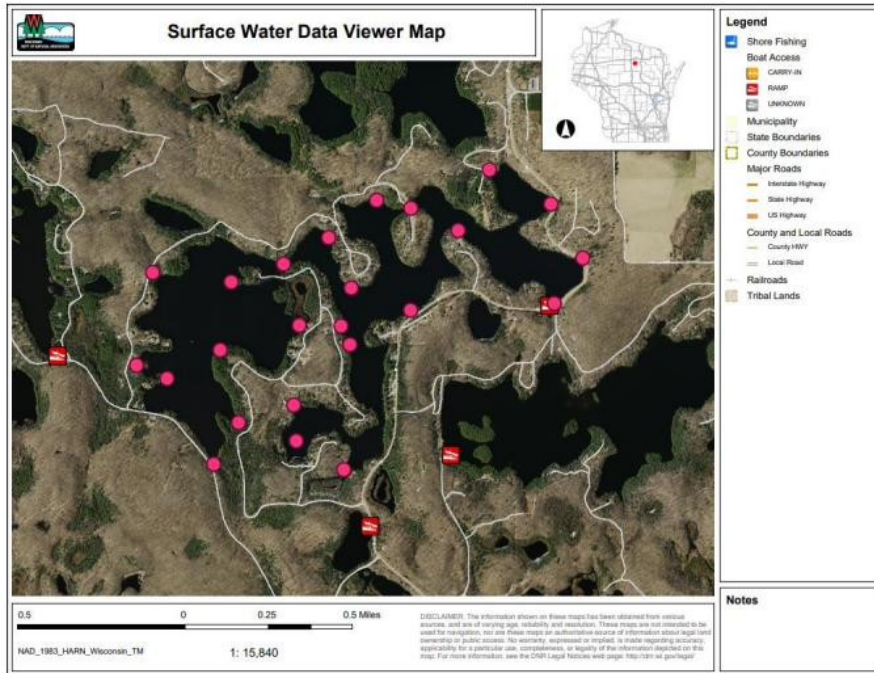










Figure 2: Search Sites on Long & Bass Lakes, Lincoln County, WI.

Table 1: Common plants found in Long & Bass Lakes

<p>Common Bladderwort (<i>Utricularia macrorhiza</i>)</p> <p>Description: This plant can be rooted or free floating. It is carnivorous and has special bladders to trap prey and ingest it. Leaves are finely divided, branching 3-9 times, alternate or opposite. Has tiny hairs on leaflet margins that trigger the bladders. Flowers look like snapdragons, and are either yellow or purple, they appear in clusters of 6-20 on stalks. Flowers are 5 parted, 2 lipped, and either have a straight or hooked spur below lower lip.</p> <p>Status: Native</p> <p>Photograph: Sam Coates</p>	
<p>Watershield (<i>Brasenia schreberi</i>)</p> <p>Description: Stem attached to center of leaf underside. Stems and underside of the leaf are usually covered in a clear, slimy coating. Veins radiating outward from the center of the leaf. Leaves are mainly floating, 5-15cm long, and football shaped. Flower 6-8 parted, red-purple, 2 cm wide.</p> <p>Status: Native</p> <p>Photograph: Sam Coates</p>	
<p>White Water Lily (<i>Nymphaea odorata</i>)</p> <p>Description: Large, round, green-purple leaves with a narrow notch from the leaf edge to near center. The leaves are floating and can grow up to 30 cm in diameter. It has white floating flowers with a yellow center. Within Bass and Long Lake the pads were well into the 30 cm length.</p> <p>Status: Native</p> <p>Photograph: Sam Coates</p>	
<p>Pickerel weed (<i>Pontederia cordata</i>)</p> <p>Description: Usually an emergent plant, but can be found on shore. Submerged leaves are alternate, thin, bright green and tapering to a pointed tip; 3-7 dark veins are evident and prominent. Hard seeds may be found and attached to young plants under the substrate. Emerged plants have lance to arrow shaped leaves with parallel veins. Flowers are blue to violet with a yellow spot on the top petal with six petals total. Flowers are produced on an emerged flower spike.</p> <p>Status: Native</p> <p>Photograph: Sam Coates</p>	

<p>Creeping Bladderwort (<i>Utricularia gibba</i>)</p> <p>Description: Alternate leaves up to $\frac{3}{8}$ inch long and forked 1-2 times. Stems are up to 10 inches in length and can either be free floating, submerged, or creeping along the lake bottom. Flowers are bright yellow, snapdragon-like, and can be in groups of up to three flowers. Lower and upper lip of the flower are generally the same length. Large inflated pouch with an indent at the tip and a red spot in the indent along with streaks of red on the top of the pouch. Thick curved spur underneath lower lip that is less than or equal in length as lower lip. Fruit is a round capsule about $\frac{1}{8}$ inch in diameter with the remnants of the style at the tip.</p> <p>Status: Native Photograph: Sam Coates</p>	
<p>Bur-reed (<i>Sparganium spp.</i>)</p> <p>Description: An aquatic plant that can be found anywhere where there is moist soil. Stems can either be floating, emergent, or originate from rhizomes. Flowers are spherical heads and the fruit of the flowers turn the spherical head into spiked balls.</p> <p>Status: Native Photograph: Sam Coates</p>	
<p>Alternate-Flowered Milfoil (<i>Myriophyllum alterniflorum</i>)</p> <p>Description: Stems are very slender, often heavily branched, with internodes and leaves usually less than 1 cm in length. Leaves in whorls of 3-4, with each leaf divided into 3-10 pairs of leaflets. Flower Spikes are emergent, with toothed alternate upper bracts and flowers. No turions are produced.</p> <p>Status: Native Photograph: Hayley Djupstrom</p>	
<p>Arrowhead (<i>Sagittaria spp.</i>)</p> <p>Description: The arrowhead species are characterized by a large arrow shaped leaf that can either have very thin and pointed segments or have very thick and rounded segments. Their flowers are on a separate stem from the leaves and have three white petals surrounding either a cluster of yellow pollen bearing stamens or around numerous flattened pistils.</p> <p>Status: Native Photograph: Sam Coates</p>	

Water Smartweed (*Persicaria amphibia*)

Description: An emergent plant with swollen leaf nodes that spreads over the water. Leaves smooth, alternate, rounded or slightly pointed. Leaves have prominent midvein and branching side veins. Flowers are a pink spike and raised above the surface of the water. Plant often starts on land where it is larger and dark green, and may be very hairy in upland sites.

Status: Native

Photograph: Hayley Djupstrom



Jewelweed (*Impatiens capensis*)

Description: This plant can get 2-5 ft tall. Its leaves vary between 1 and 3 inches in length and about 1-½ inches wide, they are hairless and generally oval or egg shaped with wide spacing between the edge serrations. Leaves are alternately placed and the stem is heavily branched with light green to nearly translucent in color. The flowers can be in groups of 1-3 in the upper parts of the plant. Looks like a tube or a funnel with a long narrow spur on the back that curves underneath the tube. The flower contains two round broad lower lobes and a smaller upper lobe. The flowers are typically orange with red dots. The fruit is a thin pod that can get to one inch in length and will launch its seeds when the pod is jostled.

Status: Native

Photograph: Hayley Djupstrom



Needle Spikerush (*Eleocharis acicularis*)

Description: Looks like thin grass that creeps across the substrate by underground rhizomes. The thin straight stems are 3-12 cm tall and are either in small rosettes or singular plants. Plants may be on wet shorelines or in shallow water. Spikelets are wider than the stem and produced above the water, and are 2.5-7 mm long with a greenish midrib.

Status: Native

Photograph: Sam Coates



Pipewort (*Eriocaulon aquaticum*)

Description: Small rosettes of Pipewort are commonly 5-8 cm across, with 3-9 veins per leaf and many cross veins. Leaves are widest at the base and taper to a fine point at the top. Roots are segmented and unbranched. Small, white, button-like flowers are produced on a long emergent stalk. Stalks are commonly 10-15 cm tall, but can be much longer if in deep water.

Status: Native

Photograph: Hayley Djupstrom



Small Duckweed (*Lemna minor*)

Description: Free-floating, round leaves, green above and below, less than 5mm long. May have several fronds in a cluster, but each frond has only one root. Can be very abundant in nutrient-rich waters.

Status: Native

Photograph: Sam Coates



Coontail (*Ceratophyllum demersum*)

Description: Plant often heavily branched, light green to brown. Leaves whorled, delicate, with some leaves branching two to three times. The tip of the plant is very bushy. Flowers, if present, are small and located in the leaf axils in early summer. Fruits are rarely produced. Commonly found adjacent to bogs.

Status: Native

Photograph: Hayley Djupstrom



Water Arum (*Calla palustris*)

Description: Large heart-shaped leaves, 5-10 cm, on a sturdy stalk, 10-20 cm. It has a leathery creamy white flower with a single petal that wraps and emerges directly from the stem. It has a compact floral spike wrapped in the flower. Produces bright red berries that hold a few seeds.

Status: Native

Photograph: Hayley Djupstrom



Fireweed (*Chamaenerion angustifolium*)

Description: At first glance it can be confused for Purple Loosestrife. Ranges from 1-6 ft in length. Flowers are a purple pink with four paddle shaped petals with 4 narrow darker sepals that are shorter. When in bloom it blooms from bottom of the spike upwards. Leaves are 2-8 inches long and up to 2 inches wide. Mostly toothless and somewhat wavy around the edges ending in a pointed tip. It contains a creamy white midrib with little to no leaf stalk. Early Spring leaves are narrow with prominent horizontal grooved veins. Fruit is a slender upright pod that turns purplish red as it ripens.

Status: Native

Photograph: Lynn Pyle, Texas Wildflower Center Digital Library







<p>Common Hops (<i>Humulus lupulus</i>)</p> <p>Description: A creeping plant that can grow to be 25 feet in length. Stems are branched and green. Stems and leaf stalks have scattered downward-pointing hairs that grab onto structures and allow the vine to climb. Leaves are opposite, 1-6 inches long and can be nearly as wide. Leaves 3-7 lobes have sharply pointed tips and edges of the leaves are serrated. Separate male and Female flowers on separate plants. Floral bracts enlarge and create a cone-like structure up to 3 inches long, holding the yellowish, gland-dotted seeds. Cones ripen to straw-colored then brown and persist through winter.</p> <p>Status: Native</p> <p>Photograph: Peter M. Dziuk, Minnesota Wildflowers</p>	
<p>Broad-leaved Cattail (<i>Typha latifolia</i>)</p> <p>Description: Can get 3-10 ft. in height. Stems are single, erect, stout, light green and unbranched. Large colonies are formed from rhizomes. Leaves are basal and alternate, stiff, flat, 1/2-3/4 inches wide, blue-green when alive. Male Flowers form in a spike above the female flower spike. Male flowers are yellowish and can be up to 10 inches long. Female flowers are light green at flowering and turn reddish-brown to blackish when fruiting. There is usually no gap in between the male and female flowers if there is it will not typically be larger than 1/3 inches of separation.</p> <p>Status: Native</p> <p>Photograph: Peter M. Dziuk, Minnesota Wildflowers</p>	
<p>Bullhead Pond Lily (<i>Nuphar variegata</i>)</p> <p>Description: An aquatic plant with heart-shaped leaves, floating on the surface, that can have leaves up to 40 cm long. It has stems winged in the cross section. This plant has a yellow, cup-shaped flower, 3-6cm wide.</p> <p>Status: Native</p> <p>Photograph: Peter M. Dziuk, Minnesota Wildflowers</p>	

Table 2: Aquatic invasive species found in Long/Bass Lakes

<p>Chinese Mystery Snail (<i>Cipangopaludina chinensis</i>)</p> <p>Description: Small animals with a coiled spiral shell. They grow up to three inches tall and are olive, brown, or black colored. The shell opening is on the right when the shell is pointed up. By the opening of their shell there is a ridge on the shell that can be felt by running your thumb across. They reproduce rapidly.</p> <p>Status: Invasive</p> <p>Photograph: Hayley Djupstrom</p>	
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Resources:

Wisconsin Department of Natural Resources' Find a Lakes Page:

<https://dnr.wi.gov/lakes/lakepages/LakeDetail.aspx?wbic=990100>

Wisconsin Department of Natural Resources' Surface Water Data Viewer:

https://dnrmaps.wi.gov/H5/?viewer=SWDV&runWorkflow=search¶m=LAKE,WATERBODY_WBIC,990100

Wisconsin Department of Natural Resources' Wisconsin Water Page:

<https://dnr.wi.gov/water/waterDetail.aspx?key=128803>

Lincoln County Conservation Program:

<https://co.lincoln.wi.us/land-services/page/conservation>

For more information, please contact:

Tom Boisvert, Conservation Program Manager
Lincoln County Land Services Department
801 North Sales Street, Merrill, WI 54452
Phone (715) 539-1054

Appendix F: Sensitive Area Survey (2002)

Wisconsin DNR Integrated Sensitive Area Survey Report and Management Guidelines

Survey conducted July 17, 2001 - Published 2002

**LONG AND BASS LAKES
SENSITIVE AREA SURVEY REPORT
AND MANAGEMENT GUIDELINES
2002**



This document is to be used
with its companion document
"Guidelines for protecting, maintaining,
and understanding lake sensitive areas"



Wisconsin Department of Natural Resources

Long and Bass Lakes (Lincoln County, Wisconsin) Integrated Sensitive Area Survey Report

Date of Survey: July 17th, 2001

Number of Sensitive Areas: 10

Site Evaluators: Dave Seibel, Fisheries Biologist (Antigo)
Laura Herman, Aquatic Plant Specialist (Rhinelander)
Rick Wissink, Wildlife Biologist (Merrill)
Gary Bartz, Water Management Specialist (Antigo)
Jennifer Wudi, Water Resources Biologist (Rhinelander)

Authors: Rick Jirsa, Assistant Water Resources Specialist (Rhinelander)
Jennifer Wudi, Water Resources Specialist (Rhinelander)

General Lake Information

Long Lake in Lincoln County (Township 34 North, Range 8 East Section 13) is 132 acres with a maximum depth of 62 feet. Bass Lake in Lincoln County (Township 34 North, Range 8 East, Section 16) is 100 acres with a maximum depth of 43 feet. A navigable channel connects these two lakes. For the purposes of this designation the two lakes were treated as one system.

These lakes have slightly acidic water with good transparency based on water quality information from the 1982 Surface Water Resources Inventory of Lincoln County. Both lakes are seepage lakes. Seepage lakes receive water from precipitation, limited watershed runoff, groundwater, and have no outlet.

These lakes provide good fisheries. Gamefish species present include largemouth bass, northern pike, walleye and a few brown trout remaining from stockings prior to 2000. Panfish species are primarily bluegill and black crappie, with fewer numbers of yellow perch, pumpkinseed and rock bass.

Undeveloped shorelines and shallow water communities provide habitat for a wide variety of wildlife including eagles, ospreys, loons and otters. This report will identify important wildlife habitat on Long and Bass Lakes.

There is not a lot of aquatic plant diversity (number of species) on Long and Bass Lakes. Generally plant densities were low, with only a few large plant beds on the lake. Aquatic plant beds should be protected. Aquatic plant management permits are required for plant control in areas with any species of concern and for any chemical control and mechanical harvesting. A permit is not required for manual removal of aquatic plants in an area less than 30' wide along the shoreline. Please contact your aquatic plant management specialist before conducting any aquatic plant control on Long or Bass Lakes.

There is a boat landing with parking spots across and along County Highway B. This landing serves both Long and Bass Lakes.

Special Concern Species

Farwell's watermilfoil, a species of special concern in Wisconsin's Natural Heritage Inventory (NHI), was found at 4 sensitive area designations within Long and Bass Lakes. Special concern species are those species in which some problem of abundance or distribution is suspected but not yet proven. The main purpose of this category in the NHI is to focus attention on certain species before they become threatened or endangered. Threatened species may in the future become endangered and a problem of abundance or distribution has been proven.

Common Name	Scientific Name	Last Observed/Class
Farwell's Watermilfoil	Myriophyllum farwellii	2001 Special Concern

Introduction

This survey was conducted on July 17th, 2001 using the Wisconsin Department of Natural Resources protocol guidelines for conducting and implementing sensitive area surveys. Surveys of this type are an integrated team approach to resource management, utilizing the expertise of many DNR resource managers. As a team, resource experts collaborate to identify locations around a lake which are critical to the future health and balance of the lake's ecosystem. Sensitive area surveys will provide lake organizations, owners of shoreline property, county zoning officials, DNR personnel, and other interested individuals with specific management recommendations that can be used to help protect and improve the overall health of lakes.

The companion document "**Guidelines for protecting, maintaining, and understanding lake sensitive areas**" (contact local WDNR lakes coordinator for a copy) may be used for additional information to help understand lake sensitive area reports. This document contains information that will help people understand the important factors that determine the health of lake ecosystems. The material focuses on areas that include aquatic plant sensitive areas, shoreline land use and lakeshore buffers, gravel and coarse rock rubble habitat, large woody cover, various water regulations and zoning concerns and management recommendations for protecting valuable habitat.

Ten sites identified on Long and Bass Lakes contain critical habitat and were designated as sensitive areas (refer to *Appendix A* for site locations). Natural resource managers identified these areas, and highly recommend additional protection for the future.

Overview of Sensitive Area Designations

Sensitive areas are often located in areas that consist of aquatic/wetland vegetation, terrestrial vegetation, gravel/rubble lake substrate, or areas that contain downed woody cover (fallen trees or logs). These areas provide water quality benefits to the lake, reduce shoreline erosion, and provide habitat that is necessary for seasonal or life stage requirements of fish, invertebrates and wildlife. A 'designated sensitive area' alerts interested individuals (ie. DNR personnel, county

zoning personnel, lake associations, etc.) that the area contains critical habitat vital to sustaining a healthy lake ecosystem and/or features an endangered plant or animal. Consequently, permit reviews and decisions regarding water-based actions within a sensitive area should be highly scrutinized by management personnel, and information presented in a sensitive area report may discourage certain permits from being approved within these sites. Although only ten specific areas have been designated as sensitive areas, this entire body of water is unique and should be considered sensitive to development and loss of habitat.

Exotics

During this survey there were no documented occurrences of exotic species. Invasion of Purple Loosestrife is always a concern and should be dealt with immediately. Methods for control are to remove the entire plant before it produces seeds or by cutting the flower head and spraying the remaining plant stem with an approved herbicide. The flower head should be burned or disposed of in an appropriate landfill. Do not compost the flower head, as the seeds will germinate in your compost bin. You should contact the Department before any of these methods are implemented.

Many aquatic exotics, such as Eurasian watermilfoil, curly-leaf pondweed and zebra mussels are brought in by human activity (boating, fishing, etc). Exotics have a better chance of establishing in areas where the bed of the lake has been disturbed and/or where native plants are sparse. Protection of native plant beds will help slow the spread of exotics if exotics enter this system.

Shoreland Management

Wisconsin's Shoreland Management Program, a partnership between state and local government, works to protect clean water, habitat for fish and wildlife, and natural scenic beauty. The Program establishes minimum standards for lot sizes, structural setbacks, shoreland buffers, vegetation removal and other activities within the shoreland zone. The shoreland zone includes land within 1000 feet of lakes, 300 feet of rivers, and floodplains. With research demonstrating that current standards may be inadequate to protect water resources and the fish and animals that depend on them, many communities have chosen to go beyond the minimum standards to ensure our natural resources are adequately protected. This report will provide management guidelines for activities within the lake and in the immediate shoreland area. Before any recommendations in this report are completed, please check with the DNR or local government for required approvals.

A vital step in protecting our water resources is to maintain an adequate buffer. A shoreland buffer should extend from the water onto the land at least 35 to 50 feet. Studies have shown that buffers less than 35 feet are not effective at preventing water pollution. Deeper buffers of 50 feet or more can help provide important wildlife habitat for songbirds, turtles, frogs, and other animals, as well as help to filter out pollutants from runoff. In general, no mowing should occur in the buffer area, except perhaps in a viewing access corridor. This buffer should match the typical ecosystem in Northern Wisconsin, and include the following three layers; herbaceous, shrub and tree layers.

In addition, the reader should also investigate other innovative ways to reduce the impacts of runoff flowing into the lake while improving critical shoreline habitat. This may include using

phosphorus-free fertilizer, installing rain gardens, setting the lawnmower at a higher mower height, restoring aquatic plant communities and reducing the area of impervious surfaces.

Whole Lake Recommendations:

There were several recommendations that resources managers commented on for both lakes. These recommendations are for the whole lake rather than a specific sensitive area.

1. Aquatic plant species in the lakes are not abundant, therefore all aquatic plant beds should be protected and maintained.
2. Prevent the establishment of exotic species (signs, education, etc).
3. One special concern (SC) plant species that is listed in Wisconsin's Natural Heritage Inventory was found in Long and Bass Lakes. No removal-this species must be protected.
4. Compliance with Shoreland Zoning standards including maintaining no-cut buffers, setbacks, removal of old nonconforming buildings that are in disrepair and limiting impervious surfaces.
5. Restoring the shoreland buffer or maintaining existing buffers.
6. Walleye spawning habitat has been lost in the lakes. A habitat project along CTH B next to the boat launch provides a good area to create walleye spawning habitat.
7. Monitor water quality for early detection of change or degradation.

Resource Value of Site 1

This site is located on Bass Lake and is a large shallow bay including open water habitat and wetland habitat (start point 45.25.74 N, 89.29.13 W; end point 45.25.80 N, 89.29.23 W). This bay provides distinctly unique aquatic vegetation, terrestrial vegetation, wildlife habitat and water quality benefits. Site length is approximately 360 feet and has an average water depth of approximately 1.5 feet. The important habitat of the sensitive area is located within the littoral zone, shoreline and near-shore terrestrial area. The majority of the substrate is muck and detritus however near the open water there is also gravel substrate. The shoreland buffer consists of wetland and hardwood/conifer forest upland. A large area of wetland is located below the Ordinary High Water Mark, herein referred to as OHWM. Trees dominate the shoreland buffer from the water's edge to 35 feet inland. Large woody cover was abundant at the site (more than 6 pieces/30 meters shoreline). There is only one developed parcel near the site; it is located on the very edge of the site and therefore Natural Scenic Beauty, herein referred to as NSB, rated average compared to other areas of the lake. There is a significant wetland complex and exotic species prevention educational opportunity at this site because a majority of it is wadable and below the OHWM.

This site's unique characteristics provide water quality benefits to the lake. The area is a nutrient, biological and physical buffer zone. The aquatic and emergent vegetation and shallow areas provide many benefits to the lake. Vegetation filters and stores nutrients, protects native plant communities from the establishment of exotics, reduces the likelihood of erosion and plant fragmentation, and provides micro-habitats.

Although fisheries was not a primary reason for site selection there are fishery resource values. This area provides spawning areas, nursery areas, feeding areas, and protective cover for game and non-game species.

The emergent vegetation, floating leaf vegetation, shrubs, brush, and snag trees in this area provide important habitat for a variety of upland wildlife, furbearers, birds, amphibians and reptiles. Deer, raccoon, muskrat and mink use the site. This area provides shelter and cover, nesting areas and feeding areas for ducks, songbirds, frogs and toads. Turtles will find shelter and cover in the area as well. It is a potential loon nesting area.

The aquatic plant community was quite diverse. Farwell's watermilfoil, a plant species of special concern, was found at this site. The following table lists all species present at this site:

PRESENT	COMMON	ABUNDANT	DOMINANT
Rushes Juncus effusus (Soft rush)	Emergents Scirpus sp. (bul-rush)	Sedges Eleocharis ovata (spike-rush)	Shrubs Chamaedaphne sp. (leatherleaf)
Herbs Lobelia sp. (great blue lobelia)	Floating Leaf Nymphaea sp. (water lily) Brasenia sp. (watershield) Polygonum sp. (smartweed)	Turf Formers/Rosettes Isoetes sp. (quillwort) Littorella (plantain shoreweed) Lobelia sp. (water lobelia)	Emergents Sparganium sp. (bur-reed)
Emergents Sagittaria sp. (arrowhead) Pontederia sp. (pickerelweed) Calla palustris (water arum)	Turf Formers/Rosettes Juncus paleocarpus (brown fruited rush) Elatine minima (waterwort)	Potamogetons P. natans (floating leaf pondweed)	
Sedges Dulichium sp. (3-way sedge)			
Floating Leaf Nuphar sp. (water lily)			
Submergents Utricularia vulgaris (common bladderwort) Myriophyllum farwellii (Farwell's watermilfoil) Myriophyllum sibiricum (northern watermilfoil)			
Turf Formers/Rosettes Eriocaulon sp. (pipewort) Myriophyllum tenellum (dwarf) Sagittaria sp. (arrowhead)			
Potamogetons P. epihydrus (ribbon leaf pondweed)			

Management Recommendations:

1. Protect snag trees, coarse woody cover and live den trees in the upland and near-shore habitat.
2. No dredging and minimize disturbance of substrate.

3. Minimize shoreline disturbance (grading, cutting, mowing, placement of structures, etc) below the OHWM, 35-foot shoreland buffer and within the shoreland zone.
4. Protect existing spawning substrate from sedimentation; no pea gravel/sand blankets.
5. Aquatic plants should be protected. No chemical, physical or mechanical treatments.
6. Farwell's watermilfoil, a plant species of special concern was found at this site. This species must be protected. No chemical, physical or mechanical treatments.
7. Protect existing vegetation along the shoreline for erosion control. No hard armoring such as riprap or seawalls should be permitted in the area.
8. Maintain boats and piers in the current location. Seasonally moving these structures would damage additional habitat.
9. The boardwalk currently running from the upland developed site to the open water pier should be minimized and open to allow water movement.
10. All local zoning regulations should be strictly adhered to for any lots adjacent to this area.
11. Minimize wetland encroachment and maintain buffers where possible.

Resource Value of Site 2

This site is located to the east of the public boat landing (45.25.88 N, 89.28.08 W). Fisheries was the primary reason for site selection. This area consists of coarse woody cover and a future walleye spawning habitat restoration project. Site length is approximately 690 feet and is from the OHWM to the 6 foot depth contour. The important habitat of this sensitive area is located within the littoral zone and bottom substrate consists mostly of rubble. The shoreland buffer consists of sparse vegetation on the bank and the highway shoulder. Shrubs and trees are present and make up the shoreland buffer character from the waters edge to 35 feet inland. Large woody cover was abundant at the site (more than 6 pieces/30 meters shoreline), and the NSB rating ranked very poor compared to other areas of the lake. There is a significant fisheries and exotic species prevention educational opportunity at this site due to the proximity to the road and boat launch.

This area provides distinctly unique habitat for walleye, northern pike, largemouth bass, perch, sucker and Centrarchid (sunfish family) fish species. Boulder, rubble and gravel substrate provides potential spawning habitat for sucker, walleye, and largemouth bass. Woody cover and floating leaf vegetation provide a feeding area and protective cover for walleye, northern pike, largemouth bass, perch and Centrarchids. Wildlife species would most likely not use this area due to the proximity of the highway.

The aquatic plant community wasn't very diverse. The following table is a list of aquatic plants found at this site:

PRESENT	COMMON	ABUNDANT	DOMINANT
Emergents Sparganium sp. (bur-reed)	Sedges Eleocharis ovata (spike-rush)		
Floating Leaf Nymphaea sp. (water lily)	Floating Leaf Brasenia sp. (watershield)		
Turf Formers/Rosettes Isoetes sp. (quillwort) Juncus paleocarpus (brown fruited rush) Lobelia sp. (water lobelia) Elatine minima (waterwort)			
Potamogetons P. epiphydus (ribbon-leaf)			

Management Recommendations:

1. Placement of a rock/rubble/gravel reef would improve the quality of the area as a spawning grounds.
2. Efforts should be taken for the prevention of shoreline erosion and pollutant transfer into the lake.
3. Aquatic plants should be protected; no chemical, physical or mechanical treatments.
4. Do not remove or cover coarse woody cover.

Resource Value of Site 3

This site is located along County Highway B on a bay on Long Lake (start point 45.25.88 N, 89.28.25W; end point 45.25.88N, 89.28.25W). Fisheries was the primary reason for site selection. This area consists of coarse woody cover that is distinctly unique for these waterbodies. The lake association put in several tree drops for fish habitat at this site. Site length is approximately 1,000 feet and is from the OHWM to the 11 foot depth contour. The important habitat of the sensitive area is located within the littoral zone; dominant bottom substrate is sand and muck although there is some rubble/rock habitat. The shoreland buffer consists of wooded upland with a mixture of herbaceous vegetation, shrubs and trees. Large woody cover was abundant at the site (more than 6 pieces/30 meters shoreline), and the NSB rating was average compared to other areas of the lake. This site provides a visual and audible buffer from the nearby highway.

This site provides excellent fish spawning and rearing habitat for largemouth bass, Centrarchids and suckers. The area also provides feeding grounds and protective cover for game and non-game species. Rock/rubble substrate near the ending point of the area provides possible walleye spawning habitat.

This area also provides water quality benefits and wildlife habitat. The shoreland area above the OHWM provides a buffer for nutrients from stormwater and other human influences. The buffer also provides upland soil stabilization therefore reducing the amount of sediment entering the

lake. This area does not provide more valuable habitat than any other area on the lake for wildlife species such as songbirds, raccoon, upland wildlife. Potentially ducks would utilize the well established wooded areas including oak, birch and cherry.

The aquatic plant community was somewhat diverse at this site. The following table lists all plants present at this site:

PRESENT	COMMON	ABUNDANT	DOMINANT
Rushes Juncus effusus (soft-rush)	Sedges Eleocharis ovata (spike-rush)		
Emergents Sparganium sp. (bur-reed)	Floating Leaf Nymphaea sp. (water lily) Brasenia sp. (watershield)		
Floating Leaf Nuphar sp. (water lily)	Turf Formers/Rosettes Eriocaulon sp. (pipewort)		
Turf Formers/Rosettes Isoetes sp. (quillwort)			

Management Recommendations:

1. Protect existing coarse woody cover. No removal of woody cover.
2. Minimize shoreline disturbance (grading, cutting, mowing, placement of structures, etc) below the OHWM, 35-foot shoreland buffer and within the shoreland zone.
3. Protect existing spawning substrate near the end of sensitive area from sedimentation; no pea gravel/sand blankets.
4. Aquatic plants should be protected; no chemical, physical or mechanical treatments.

Resource Value of Site 4

This site is located on Long Lake (start point 45.26.12 N, 89.28.34 W; end point 45.26.12 N, 89.28.34 W). Fisheries was the primary reason for site selection. This area provides distinctly unique bluegill spawning habitat for the lakes. Site extends from the OHWM to approximately the 10-foot depth contour under normal water conditions. The important habitat of this sensitive area is located within the littoral zone; dominant bottom substrate is sand and silt. The shoreland buffer consists of wooded upland with a mixture of herbaceous vegetation, shrubs and trees. Large woody cover was abundant at the site (more than 6 pieces/30 meters shoreline), and the NSB rating was good compared to other areas of the lake. This site provides an educational opportunity on the lakes for comparison of high quality habitat versus degraded habitat. The shoreline on the other side of the lake from this site is of lower habitat quality.

The rubble, gravel, coarse woody cover, submerged and floating leaf vegetation provides excellent fish habitat. The east end of this site provides excellent bluegill spawning habitat. On the west end of the site there is more gravel and rubble which provides walleye spawning habitat. Throughout the entire site there is a lot of woody cover. Species such as walleye, largemouth bass, Centrarchids, perch and suckers would use this area for a variety of life stage requirements.

The upland vegetation provides habitat that songbirds and furbearers would utilize for shelter, nesting and/or feeding. This site has limited wildlife habitat because of the "island-like" land formation. This area has an excellent shoreland buffer that reduces nutrient loads of surrounding upland areas. The existing near-shore vegetation also protects against erosion and thereby acts as a physical buffer zone.

The area has minimal plant diversity and abundance. The following table lists wet edge and aquatic plant species that were found:

PRESENT	COMMON	ABUNDANT	DOMINANT
Rushes Juncus effusus (soft-rush)	Emergents Sparganium sp. (bur-reed)		
Floating Leaf Nymphaea sp. (water lily)	Potamogetons P. epihydrus (ribbon-leaf)		
Turf Formers/Rosettes Eriocaulon sp. (pipewort)			

Some of the surrounding upland species include cedar, birch, maple, oak, ostrich leaf fern, hemlock, red pine and jewel weed.

Management Recommendations:

1. Create a slow-no-wake zone through the narrow portion of the waterbody on either end of the sensitive area to protect aquatic plants and spawning grounds.
2. Limit activities that impact the bottom substrate. No pea gravel/sand blankets.
3. Minimize shoreline disturbance (grading, cutting, mowing, placement of structures, etc) below the OHWM, 35-foot shoreland buffer and within the shoreland zone.

Resource Value of Site 5

This site is located on Long and Bass Lakes including the channel connecting the two lakes and the similar habitat on the Bass Lake side of the peninsula of land that creates the channel (channel start point 45.25.88 N, 89.29.14W; channel end point 45.25.87N, 89.29.19W/ Bass Lake start point 45.25.87N, 89.29.27W; Bass Lake end point 45.25.87N, 89.29.27W). This site was selected for distinctly unique wildlife habitat and aquatic vegetation. The average water depth is approximately 2 feet. The nearshore terrestrial, shoreline, and littoral zone are all critical habitat areas. In general the substrate is comprised of rubble and muck with sand underlying. The shoreland buffer consists of wetland and upland dominated by shrub species with a mix of herbaceous and tree species. Large woody cover was common at the site (3-6 pieces/30 meters shoreline), and the NSB rating was poor due to extensive development on one side of the channel. This site provides a buffer to invasive non-native species because of dense native plant communities. This site has a high level of boat traffic, as it is a confined area that connects the two lakes.

The shallow nature of this area with extensive aquatic plant beds provide many water quality attributes for the lakes. In an area with fairly high boat traffic the aquatic plants are stabilizing

the sediments and shoreline to prevent nutrient recycling within the lakes. The large amounts of plants also act as a nutrient buffer utilizing any recycling of nutrients that occurs. The plant species also provide a biological buffer from the invasion of exotic species. This site's unique characteristics provide a micro-habitat that increases the likelihood of higher biodiversity in the area and lake.

This site is important for the fisheries of the lake because it maintains free passage between the lakes and to different habitat types provided in the two lakes. The submerged and floating leaf vegetation and rubble substrate provide good habitat for game and non-game species.

This site provides some of the best wildlife habitat on the lakes. Many species will use the area for nesting, shelter and/or feeding area, including upland wildlife species, mink, ducks, loons, eagles, frogs, toads, painted turtles and snakes. The upper canopy of white pines provide perching and nesting habitat for eagles.

Aquatic vegetation was a primary reason for site selection. The aquatic plant community was quite diverse. This was one of the larger plant beds on the two lakes. The following table lists all aquatic plant species found:

PRESENT	COMMON	ABUNDANT	DOMINANT
Shrubs Chamaedaphne sp. (leatherleaf) Salix sp. (willow)	Emergents Sparganium sp. (bur-reed)	Free Floating Nymphaea sp. (water lily) Brasenia sp. (watershield)	Turf Formers/Rosettes Eriocaulons sp. (pipewort) In spots
Sedges Eleocharis ovata (spike-rush)	Turf Formers/Rosettes Eriocaulon sp. (pipewort) Elatine minima (waterwort)	Turf Formers/Rosettes Eriocaulons sp. (pipewort)	Potamogetons P. epihydrus (ribbon-leaf)- near boat channel
Emergents Sagittaria sp. (arrowhead)	Potamogetons P. natans (floating leaf)	Potamogetons P. epihydrus (ribbon-leaf)	
Turf Formers/Rosettes Juncus paleocarpus (brown fruited rush) Lobelia sp. (water lobelia) Sagittaria sp. (arrowhead)			

Management Recommendations:

1. Maintain channel as slow no wake.
2. Manage uplands for white pines and protect existing white pine sites.
3. Protect aquatic plant beds; no chemical, physical or mechanical treatments of aquatic plants unless minimum required for navigation.
4. Minimize shoreline disturbance (grading, cutting, mowing, placement of structures, etc) below the OHWM, 35-foot shoreland buffer and within the shoreland zone.

Resource Value of Site 6

This site is located on Bass Lake (start point 45.25.68 N, 89.29.54W; end point 45.25.64N, 89.29.62W). The aquatic plant community was the primary reason for this site's selection. This site is the entire bay with an average depth of approximately 4 feet. The bottom substrate in the area is predominantly muck and detritus. The shoreland buffer includes wetland, wooded upland and developed properties. Trees and herbaceous species make up the shoreland buffer character from the waters edge to 35 feet inland. Large woody cover was present at the site (1-2 pieces/30 meters shoreline). The NSB rating scored very poor due to houses encroaching on the shoreland buffer and loss of native buffer in many areas.

Similar to the other bays that have shallow water and good aquatic plant communities this site provides a nutrient, biological, and physical buffer against nutrient and sediment loads into the lake. Reducing the amount of nutrients and sediment that enter the lake can reduce nuisance algae blooms. The water quality attributes of this site have been diminished by the disturbance of the shoreland area including the 35-foot shoreland buffer.

This area is one of the few spawning areas for northern pike and perch. Other species that would take advantage of the submerged and floating leaf vegetation include walleye, largemouth bass, Centrarchids, perch and non-game species. With sufficient submerged aquatic plant beds and smartweed this area contains quality duck habitat. Other species that would utilize the emergent vegetation, floating leaf vegetation, shrubs and brush include mink, loons, eagles, frogs, toads and turtles.

The bays on these lakes are all distinctly unique in that the majority of aquatic plants are found in these areas. Farwell's watermilfoil, a plant species of special concern, was found at this site. The following table lists aquatic and wet edge plants found at this site:

PRESENT	COMMON	ABUNDANT	DOMINANT
Floating Leaf Nuphar sp. (water lily)	Floating Leaf Polygonum sp. (smartweed)	Floating Leaf Brasenia sp. (watershield)	Floating Leaf Nymphaea sp. (water lily) Polygonum sp. (smartweed)
Emergents Sagittaria sp.	Potamogetons P. epihydrus (ribbon-leaf)		
Submergents Utricularia vulgaris (common bladderwort) Myriophyllum farwellii (Farwell's water milfoil)			
Turf Formers/Rosettes Juncus sp. (rush)			
Potamogetons P. natans (floating-leaf)			

Management Recommendations:

1. Restore the shoreland buffer to at least 35-feet from the OHWM.

2. If possible combine access to open water via one pier/boardwalk. If separate accesses must be maintained reduce the width and length of all structures below the OHWM to the minimum required for access.
3. No disturbance of bottom substrate (i.e. dredging, pea gravel/sand blankets, riprap and seawalls).
4. No chemical, physical or mechanical treatment of aquatic plants.
5. Farwell's watermilfoil, a plant species of special concern was found at this site. This species must be protected. No chemical, physical or mechanical treatments.

Resource Value of Site 7

This site is located on Bass Lake and is a large shallow bay including open water habitat and wetland habitat (start point 45 25.64 N, 89 29.62 W; end point 45 25.48 N, 89 29.42 W). Primary reasons for site selection include submerged aquatic vegetation and providing a buffer against nutrients and sediments from entering the lake, which protects water quality. Average water depth throughout the bay is approximately 3 feet. The substrate is comprised mainly of sand, silt, clay and muck. The shoreland buffer is wetland habitat below the OHWM and woodland habitat above the OHWM. Coarse woody cover is present at the site (1-2 pieces/30 meters shoreline). Since this site has no human influence the NSB rating is outstanding compared to other areas of the lake.

This site is one of the few areas on the lake with significant submerged vegetation. This area is most important for northern pike and perch spawning habitat. The area also provides great nursery, feeding and protective cover for walleye, northern pike, largemouth bass, Centrarchids and suckers.

This area also provides water quality benefits and wildlife habitat. The wetland area below the OHWM provides a buffer to trap nutrients and sediments, thus protecting water quality. This area also protects native plant communities from the establishment of exotic species. The area provides great shelter, nesting and feeding for mink, ducks, loons, song birds, turtles and snakes. Floating leaf vegetation and snag trees that have fallen into the water provide much of this valuable wildlife habitat.

Due to the extensive submerged vegetation, aquatic vegetation was a primary reason for site selection. Farwell's watermilfoil, a plant species of special concern, was found at this site. The following table lists all species present at this site:

PRESENT	COMMON	ABUNDANT	DOMINANT
Sedges Eleocharis ovata (spike-rush)	Emergents Sparganium sp. (bur-reed)	Potamogetons P. natans (floating-leaf)	Floating Leaf Nymphaea sp. (water lily) Brasenia sp. (watershield)
Rushes Juncus effusus (soft rush)	Potamogetons P. epihydrus (ribbon-leaf)		Turf Formers/Rosettes Juncus paleocarpus (brown-fruited rush)
Emergents Sagittaria sp. (arrowhead)			

Floating Leaf			
Nuphar sp. (water lily)			
Polygonum sp. (smartweed)			
Submergents			
Myriophyllum farwellii (Farwell's water milfoil)			
Turf Formers/Rosettes			
Eriocaulon aquaticum (pipewort)			
Myriophyllum tenellum (dwarf watermilfoil)			
Eleocharis acicularis (needle spike rush)			

Management Recommendations:

1. Protect existing aquatic vegetation. No chemical, physical or mechanical treatments.
2. Farwell's watermilfoil, a plant species of special concern was found at this site. This species must be protected. No chemical, physical or mechanical treatments.
3. Protect snag trees and coarse woody cover in the upland and near-shore habitat.
4. Minimize shoreline disturbance (grading, cutting, mowing, placement of structures, etc) below the OHWM, 35-foot shoreland buffer and within the shoreland zone.

Resource Value of Site 8

This site is located on Bass Lake (start point 45 25.46 N, 89 29.42 W; end point 45 25.39 N, 89 29.42 W). Aquatic vegetation and natural scenic beauty were the primary reasons for selecting this site as a sensitive area. Average water depth throughout this site is approximately 3 feet. Location of important habitat is found mostly in the littoral zone with the majority of the substrate comprised mainly of sand, silt and clay. The entire shoreland buffer is wooded with oak and birch trees. Coarse woody cover is quite common throughout this site. The NSB rating is good compared to other areas of the lake.

Fisheries was not the primary reason this site was selected as a sensitive area, however with a rock, rubble, gravel point on the west end of the site, this could be a possible location for walleye spawning. Submergent and floating leaf vegetation creates possible spawning habitat for northern pike also. This area also provides nursery, feeding, and protective cover for walleye, northern pike, largemouth bass, Centrarchids, perch and suckers.

From a wildlife standpoint, this area provides great cover, nesting and feeding area for upland wildlife, amphibians and song birds. Mink, ducks and turtles also utilize the site for cover and feeding. Oak and birch trees above the OHWM provide habitat for deer and other game species.

Aquatic vegetation was a primary reason for site selection. The following table lists all aquatic plant species found at this site:

PRESENT	COMMON	ABUNDANT	DOMINANT
Floating Leaf Nymphaea sp. (water lily)	Emergents Sparganium sp. (bur-reed)	Potamogetons P. epihydrus (ribbon-leaf)	
Turf Formers/Rosettes Myriophyllum tenellum (dwarf) Lobelia sp. (water lobelia) Elatine minima (waterwort) Sagittaria sp. (arrowhead)	Floating Leaf Brasenia sp. (watershield)		
Potamogetons P. natans (floating-leaf) P. pusillus (small pondweed)	Turf Formers/Rosettes Isoetes sp. (quillwort) Eriocaulon sp. (pipewort) Juncus paleocarpus (brown fruited rush)		

Management Recommendations:

1. Protect the existing but limited rock, rubble, gravel on the point at the west end of the site for potential walleye/sucker spawning habitat.
2. Protect existing aquatic vegetation in this shallow bay. No chemical, physical or mechanical removal.
3. Minimize shoreline disturbance (grading, cutting, mowing, placement of structures, etc) below the OHWM, 35-foot shoreland buffer and within the shoreland zone.

Resource Value of Site 9

This site is located in a bay on Long Lake (45 25.39 N, 89 29.42 W). Primary reasons for site selection include aquatic vegetation, wildlife, water quality and natural scenic beauty. Site offers a nutrient, biological and physical buffer zone. Vegetation provides a sink for nutrients, reduces the likelihood of exotic invasion and reduces erosion by stabilizing soils. The aquatic plant beds also provide a micro-habitat which fluctuates water temperature and creates higher biodiversity at the site. Average water depth in this bay is approximately 1 foot with much of the substrate comprised of muck with underlying sand, silt and clay. Above the OHWM the shoreland buffer is 90% wooded with an understory of shrubs and herbaceous plants, and 10% developed which contains a lawn. Below the OHWM the bay contains a tamarack bog, which is unique to the lake. Coarse woody cover is present with 1-2 pieces/30meters of shoreline. At this site the NSB rating is outstanding compared to other areas of the lake.

Fisheries was not one of the primary reasons for site selection, however there are unique habitat features beneficial to fisheries. A large native milfoil bed provides unique perch and northern pike spawning habitat that is not common in other parts of the lake. Largemouth bass and Centrarchids will utilize this site for spawning, nursery, feeding and cover. Walleye and suckers will also use this site for nursery, feeding and a protective cover area.

Wildlife was one of the primary reasons for site selection due to the unique tamarack bog. Mink, otters and song birds all use this area for cover, nesting and feeding. Upland wildlife also rely on this area for cover and feeding.

Aquatic vegetation was a primary reason for site selection. Farwell's watermilfoil, a species of special concern, was found at this site. There is a fairly diverse population of wet edge and aquatic plants. The following table lists wet edge and aquatic plants found at this site:

PRESENT	COMMON	ABUNDANT	DOMINANT
Sedges Scirpus sp. (bul-rush) Carex sp. (sedge)	Emergents Sparganium sp. (bur-reed)		Submergents Myriophyllum farwellii (Farwell's watermilfoil)
Rushes Juncus effusus (rush)	Floating Leaf Brasenia sp. (watershield)		
Floating Leaf Nuphar sp. (water lily) Nymphaea sp. (water lily) Polygonum sp. (smartweed)	Potamogetons P. epihydrus (ribbon-leaf)		
Algae Nitella sp. (stonewort)			
Potamogetons P. natans (floating-leaf) P. pusillus (small pondweed)			

Management Recommendations

1. Protect/maintain native aquatic plant populations. No chemical, physical or mechanical removal.
2. Farwell's watermilfoil, a plant species of special concern was found at this site. This species must be protected. No chemical, physical or mechanical treatments.
3. Minimize shoreline disturbance (grading, cutting, mowing, placement of structures, etc) below the OHWM, 35-foot shoreland buffer and within the shoreland zone.

Resource Value of Site 10

This site is located on Bass Lake (start point 45 25.5582 N, 89 29.3858 W; end point 45 25.6282 N, 89 29.1496 W). Primary reason for site selection was wildlife. Site offers a nutrient buffer zone where upland vegetation provides a buffer against nutrients and sediments, and a stabilized bank, which reduces the likelihood of erosion. Approximate site length is 480 feet with the location of important habitat at the near-shore terrestrial zone. The entire shoreland buffer is wooded with a healthy understory of herbs and shrubs. Coarse woody cover is present with 1-2 pieces/30 meters shoreline. The NSB rating is outstanding compared to other areas of the lake.

Fisheries was not a primary reason for site selection, however there is woody cover and overhanging vegetation providing habitat. Walleye, northern pike, perch and suckers all utilize this site for rearing, feeding and protective cover areas. Largemouth bass and Centrarchids use

this area for all of the same reasons plus as a potential spawning area due to the floating leaf and over-hanging vegetation that is present.

Wildlife was the primary reason this site was selected as a SAD. Due to the significant length of undeveloped shoreline, upland wildlife relies on this area for cover, nesting and feeding. Mink, fisher, raccoon, song birds and eagles also use this area for cover, nesting and feeding.

Aquatic plants were very sparse at this site. *Brasenia* sp. (watershield) and *Sparganium* sp. (bur-reed) were the only plants present.

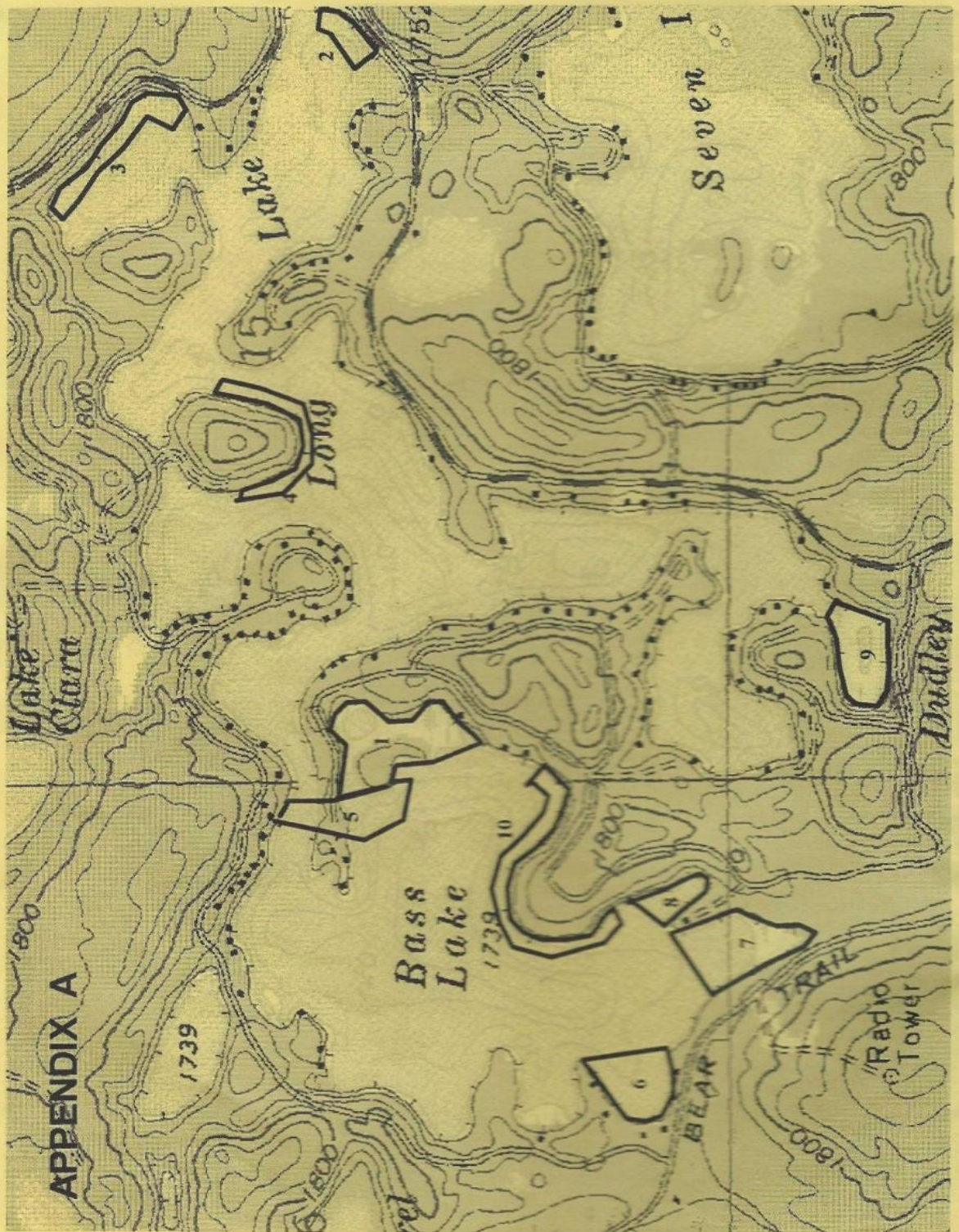
Management Recommendations:

1. Do not remove any coarse woody cover.
2. Minimize shoreline disturbance (grading, cutting, mowing, placement of structures, etc) below the OHWM, 35-foot shoreland buffer and within the shoreland zone.

Conclusion

Ten sensitive areas were designated on Long and Bass Lakes. This report identified important areas of habitat and management recommendations for each site. Shoreline development has increased over 200% in the last 35 years on Northern Wisconsin lakes (Northern Initiatives Lakes and Shorelands-1999). Lakes are one of the state's most valuable resources and without proper protection the water quality in our lakes will quickly deteriorate, thus decrease the quality of fish and wildlife habitat. All lake ecosystems are sensitive to change and man's impact. It is critical that we protect and restore these valuable resources.

All the data that was used to complete this report can be obtained at the Rhinelander DNR Service Center.



Appendix G: Fish Stocking Records

Historical fish stocking data from Wisconsin DNR Fisheries Management database and Association records.

Long Lake Stocking History

Year	Species	Strain	Age Class	Number	Avg Length	Source
1972	Muskellunge	Wisconsin	Fingerling	275	10.0"	DNR
2001	Walleye	Mississippi R	Fingerling	750	7.0"	DNR
2002	Walleye	Mississippi R	Fingerling	600	1.5"	DNR
2003	Walleye	Not Recorded	Large Fingerling	1,135	7.0"	DNR
2005	Walleye	Not Recorded	Large Fingerling	476	7.0"	Private
2006	Walleye	Not Recorded	Large Fingerling	595	-	Private
2007	Walleye	Not Recorded	Large Fingerling	595	-	Private
2008	Walleye	Not Recorded	Large Fingerling	833	-	Private
2019	Walleye	Not Recorded	Large Fingerling	833	8.0"	Private
2020	Walleye	Not Recorded	Large Fingerling	833	8.0"	Private
2021	Walleye	Not Recorded	Large Fingerling	1,190	8.0"	Private
2022	Walleye	Not Recorded	Large Fingerling	1,190	8.0"	Private
2023	Walleye	Not	Large	1,428	8.0"	Private

		Recorded	Fingerling			
2024	Walleye	Not Recorded	Large Fingerling	1,900	8.0"	Private

Long Lake Total: 12,633 fish stocked (1972-2024)

Association Investment: Estimated \$25,000-\$30,000 (2005-2024)

Bass Lake Stocking History

All Bass Lake stocking was DNR-funded. No private stocking and no stocking since 2001.

Year	Species	Age Class	Number
1972	Muskellunge	Fingerling	150
1978-1987	Brown Trout	Fingerling/Yearling	42,300
1988-2000	Brown Trout	Various	39,680
1993	Walleye	Large Fingerling	1,000
2001	Walleye	Large Fingerling	2,190

Bass Lake Total: 85,320 fish stocked (1972-2001)

Combined Total Both Lakes: 97,953 fish stocked (1972-2024)

Appendix H: Authorizing Resolution

RESOLUTION OF THE BOARD OF DIRECTORS LONG AND BASS LAKE ASSOCIATION, INC.

ADOPTION OF COMPREHENSIVE LAKE MANAGEMENT PLAN

WHEREAS, the Long and Bass Lake Association, Inc. is a Qualified Lake Association organized under Wisconsin Statute 281.68, dedicated to the protection and preservation of Long Lake (WBIC 1001000) and Bass Lake (WBIC 969600) in the Town of Harrison, Lincoln County, Wisconsin; and

WHEREAS, the Association has prepared a Comprehensive Lake Management Plan that establishes goals, objectives, and actions for the protection and enhancement of water quality, aquatic habitat, and recreational values of Long Lake and Bass Lake; and

WHEREAS, this Plan is based on over 50 years of water quality monitoring data, scientific assessments from the Wisconsin Department of Natural Resources, and input from Association members; and

WHEREAS, the Association wishes to pursue Wisconsin DNR Surface Water Grant funding to implement the actions identified in the Plan;

NOW, THEREFORE, BE IT RESOLVED that the Board of Directors of the Long and Bass Lake Association, Inc. hereby:

1. **Adopts** the Comprehensive Lake Management Plan for Long Lake and Bass Lake, dated February 2026, as the official management plan for these lakes;

2. **Authorizes** the President and Treasurer, or their designees, to submit applications for Wisconsin DNR Surface Water Grants, Healthy Lakes grants, and other funding opportunities consistent with the Plan;
3. **Commits** the Association to provide required matching funds for approved grants from Association reserves, member contributions, or in-kind services;
4. **Directs** the Board to review progress toward Plan goals annually and report to the membership at each Annual Meeting.

ADOPTED by the Board of Directors of the Long and Bass Lake Association, Inc.

on this ____ day of _____, 2026.

Jackie Leonhard, President

Marnie Kranik, Secretary

Appendix I: Contact Information

Organization	Contact	Phone/Email
Long & Bass Lake Association	Board	entireboard@longandbasslakeassociation.com
Lincoln County Land Services Dept.	Tom Boisvert	715-539-1087 thomas.boisvert@co.lincoln.wi.us
Lake Steward Program	Ted Rulseh	trulseh@tjrcommunications.com
WI DNR - Lakes	Lakes Mailbox	DNRLakes@Wisconsin.gov
Healthy Lakes & Rivers Program	-	healthylakeswi.com

- End of Plan -