BANTAM LAKE – STATE OF THE LAKE

May 2025

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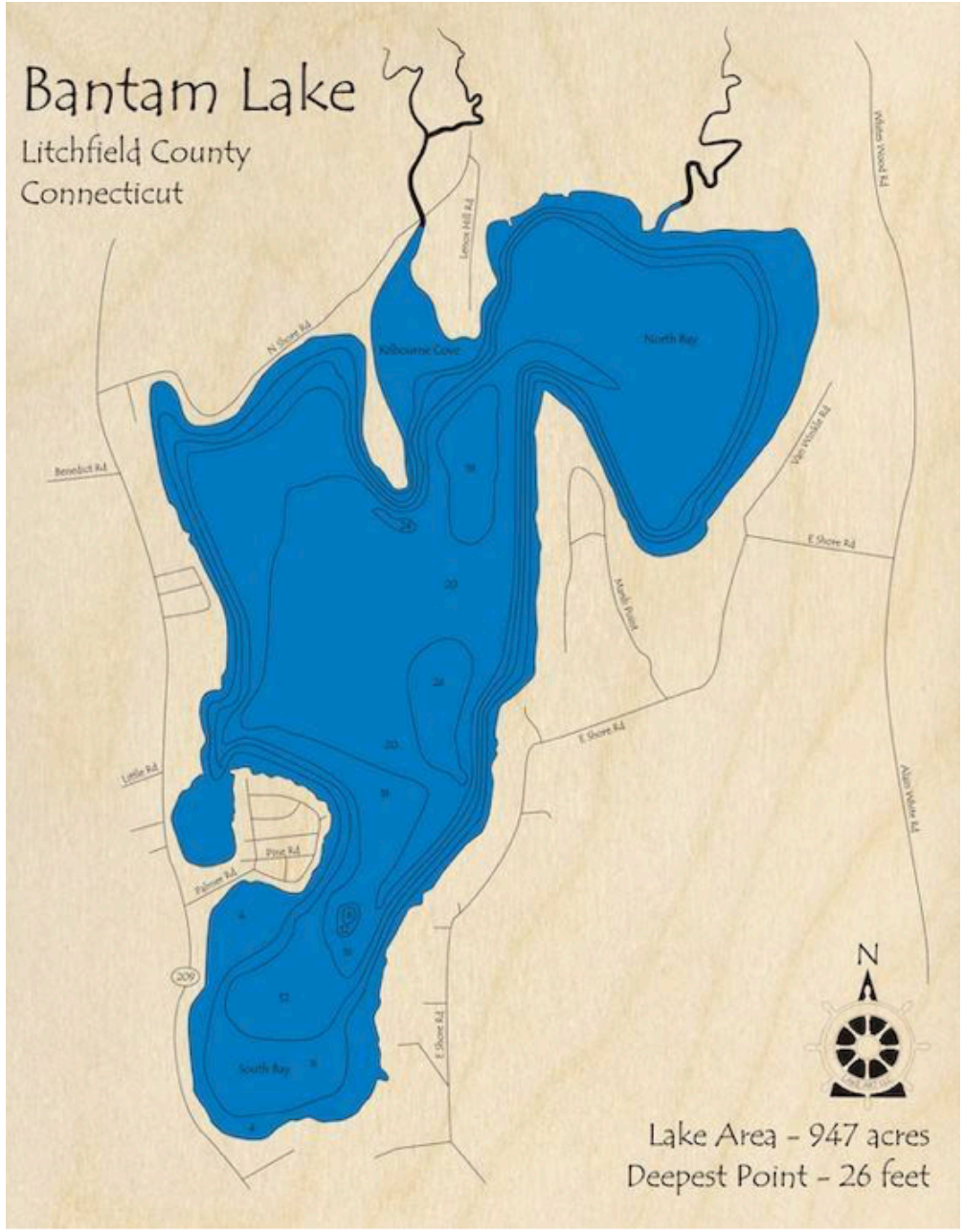


BANTAM LAKE PROTECTIVE ASSOCIATION - MISSION

Dedicated to the preservation of Bantam Lake, to maintain the beauty of Connecticut's largest natural lake

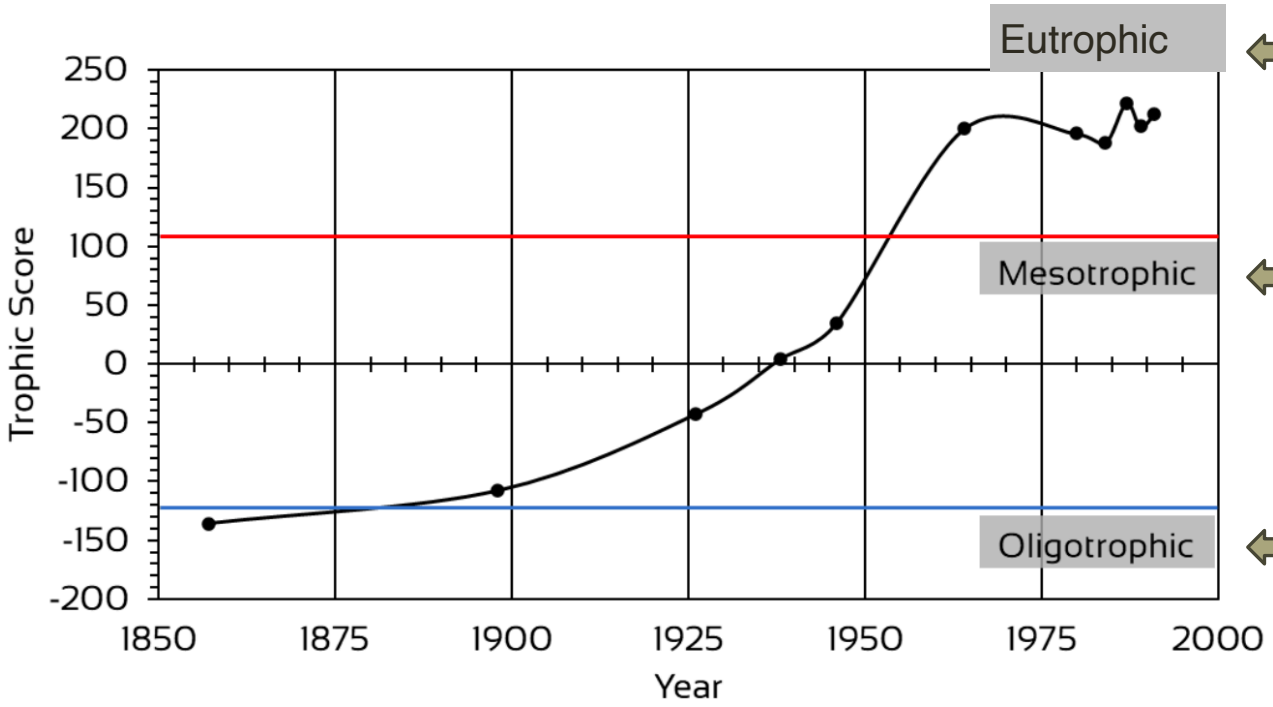
Encouragement of maintaining the highest practical water quality for swimming, fishing, boating and all water/ice sports

Control invasive weeds

Assess detrimental nutrients both in-lake and through the watershed with the goal of reducing nutrient load and improving water quality

Provide essential education for proper stewardship of the lake and watershed

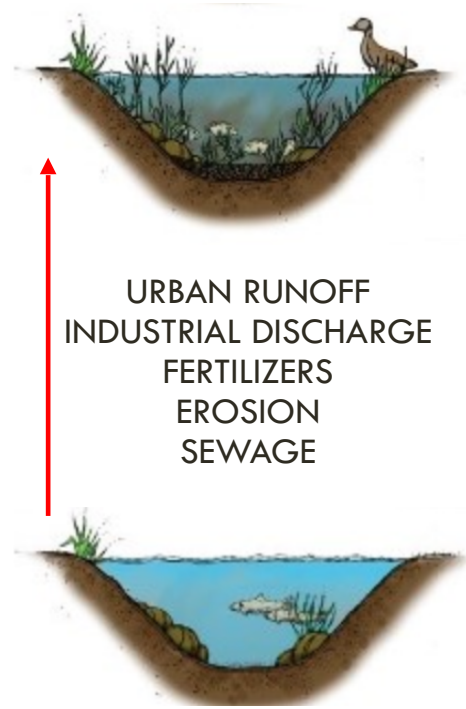
BANTAM LAKE EVOLUTION TO EUTROPHIC STATE



Abundance of phosphorus and nitrogen and plant growth/algae

Clear water with submerged aquatic plants: Medium-level of nutrients

Drinking quality clear water: low nutrient levels, oxygen rich bottom and low algae growth



URBAN RUNOFF
INDUSTRIAL DISCHARGE
FERTILIZERS
EROSION
SEWAGE

LOSS OF DISSOVLVED OXYGEN AT BOTTOM OF THE LAKE CREATING ABUNDANCE OF NUTRIENTS (PHOSPHOROUS) = ALGAE BLOOMS

FOCUS AREAS FOR BLPA

- Data collection and analysis; in lake and in watershed
  - Informs treatment decisions and remediation efforts
  - Significant focus on cyanobacteria and phosphorus / algae blooms
- Monitor and treat invasive weeds and cyanobacteria
- Advocacy with key stakeholders to influence support for the lake/watershed efforts
- Education and Outreach
  - *Take the Pledge*

INVASIVE / NON-NATIVE WEEDS

SŌLITUDE: 2024 ACTIVITY

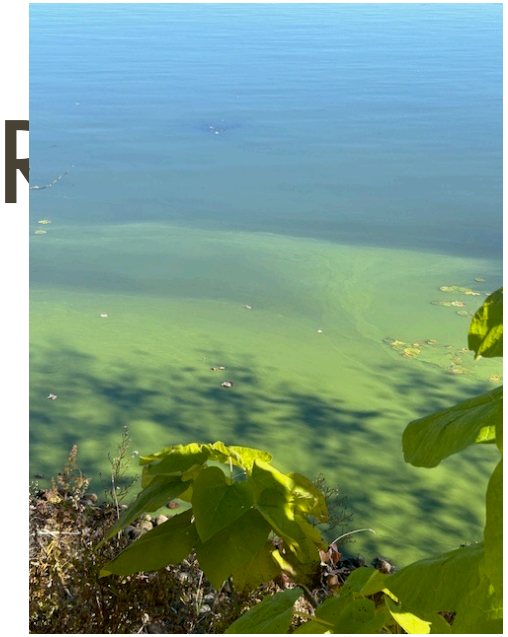
- Aquatic mgmt. program is working well to control non-native species and reduce density of other nuisance species
- No herbicide treatments were required 2022 or 2023!
- 2024 Three rounds of plant surveys:

Survey Date	Findings
May 2nd	Eurasian milfoil: Morris boat ramp, Nic's Cove, Outlet Cove, North Shore/Southern point of North Bay and White Memorial Marina. Curley Leaf pondweed near Stateboat ramp & outlet cove
July 11th	No fanwort and the only Eurasion milfoil were in treatment exclusions zones. Trace Curley Leaf near Marsh Point
Sept 17th	Eurasion Milfoil only non-native species, density limited and sparse but in several areas of the lake

- One diquat herbicide treatment June 18th to control Curly Leaf pondweed and Eurasian Milfoil
- Ongoing monitoring is important to the success of the lake: allows for quick identification and remediation
- Sept survey indicated increase in milfoil that will likely require mgmt / May 2025 treatment

ALGAE, CYANOBACTERIA & PHOSPHORUS

2024 CYANOBACTERIA SUMMAR



High concentrations of cyanobacteria can form harmful algae blooms with public health risks due to toxins produced

Cyanobacteria cell concentrations and risk levels
- 0 – 20,000 cells/mL lowest risk of toxic algae blooms
- 20,000 – 100,000 cells/mL moderate risk of toxic algae blooms
- >100,000 cells/mL highest risk of toxic algae blooms

GreenClean PRO algaecide (hydrogen peroxide) treatment deployed proactively on May 1, 2024 to reduce cyanobacteria cells in sediment and limit algae growth rates
- We expected 2-3 years of benefit from this treatment; unclear if this will happen

2024 Cyanobacteria cell concentrations results: (measured in-lake, bi-weekly throughout the season)
- April – July: conditions better than 2020 – 2023 historical comparisons at <5,000 cells/mL*
- August – early Sept: 38,000 – 89,000 cells/mL
- Late Sept – early October: 200,000-400,000 cells/mL

Hydrogen peroxide treatment showed benefits early in the season; not sustained in Sept/Oct likely due to: warming temperatures, destratification, anoxic conditions = increased phosphorus levels

* milliliter

REDUCING PHOSPHOROUS IS A SIGNIFICANT PRIORITY
SOURCES OF PHOSPHOROUS

- Fertilizers and manure (farms, lawns, golf courses, etc)
- Stormwater runoff from roads and lawns
- Wastewater treatment plants
- Soil erosion can transport phosphorus-containing sediments into lakes
- Sediments within the lake; internal phosphorous loading

Many recent/new sources of information starting to inform priorities for reducing phosphorus:

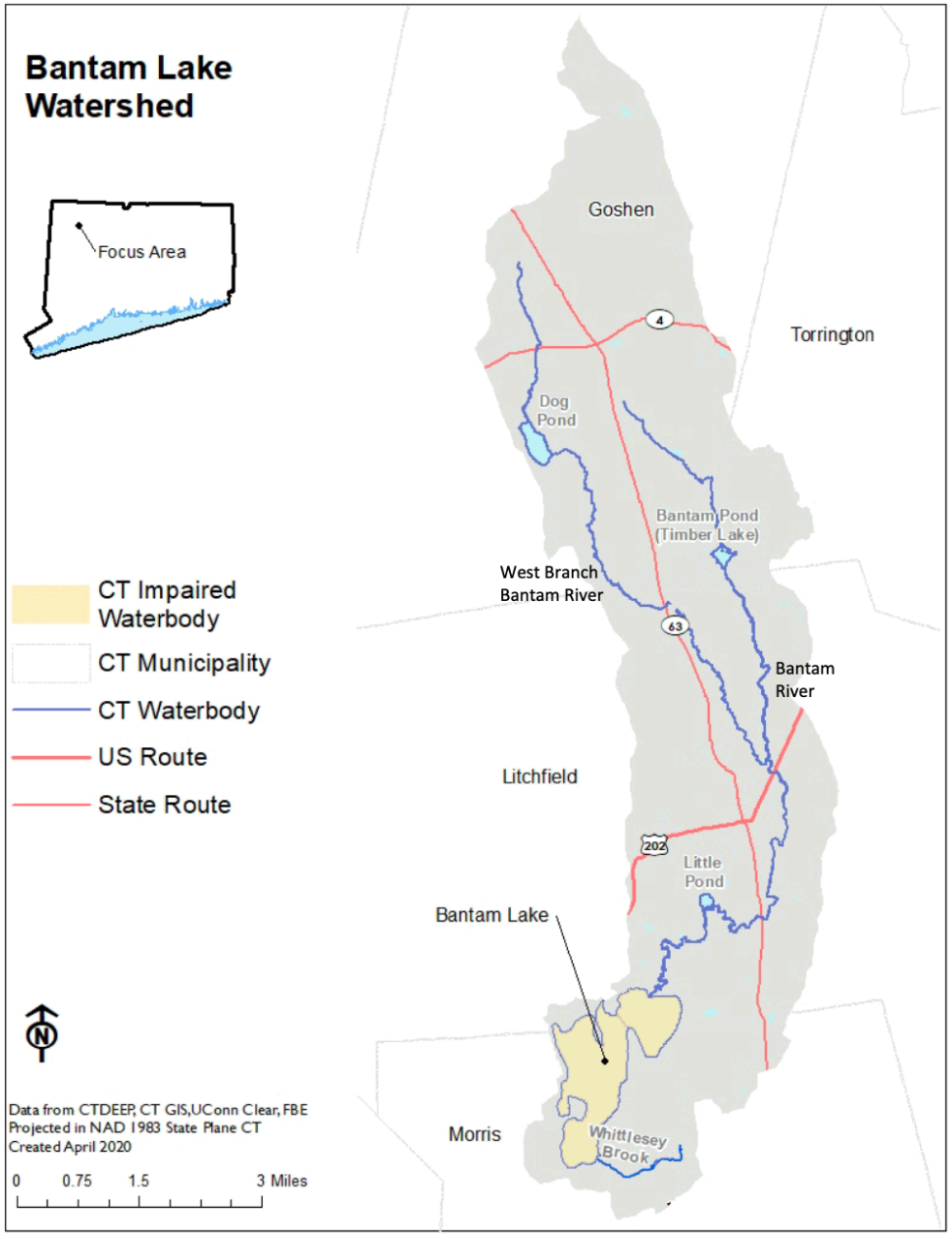
- *CT DEEP Bantam Lake TMDL (2021)*
- *Lake Sediment Analysis (2023)*
- *Watershed Data Collection (2023-2024)*
- *In-Lake Data Collection (Decades of Data)*

There is no "ONE source" – but there are clear areas of priority for improvements, you can help by taking The Pledge!

BANTAM LAKE WATERSHED

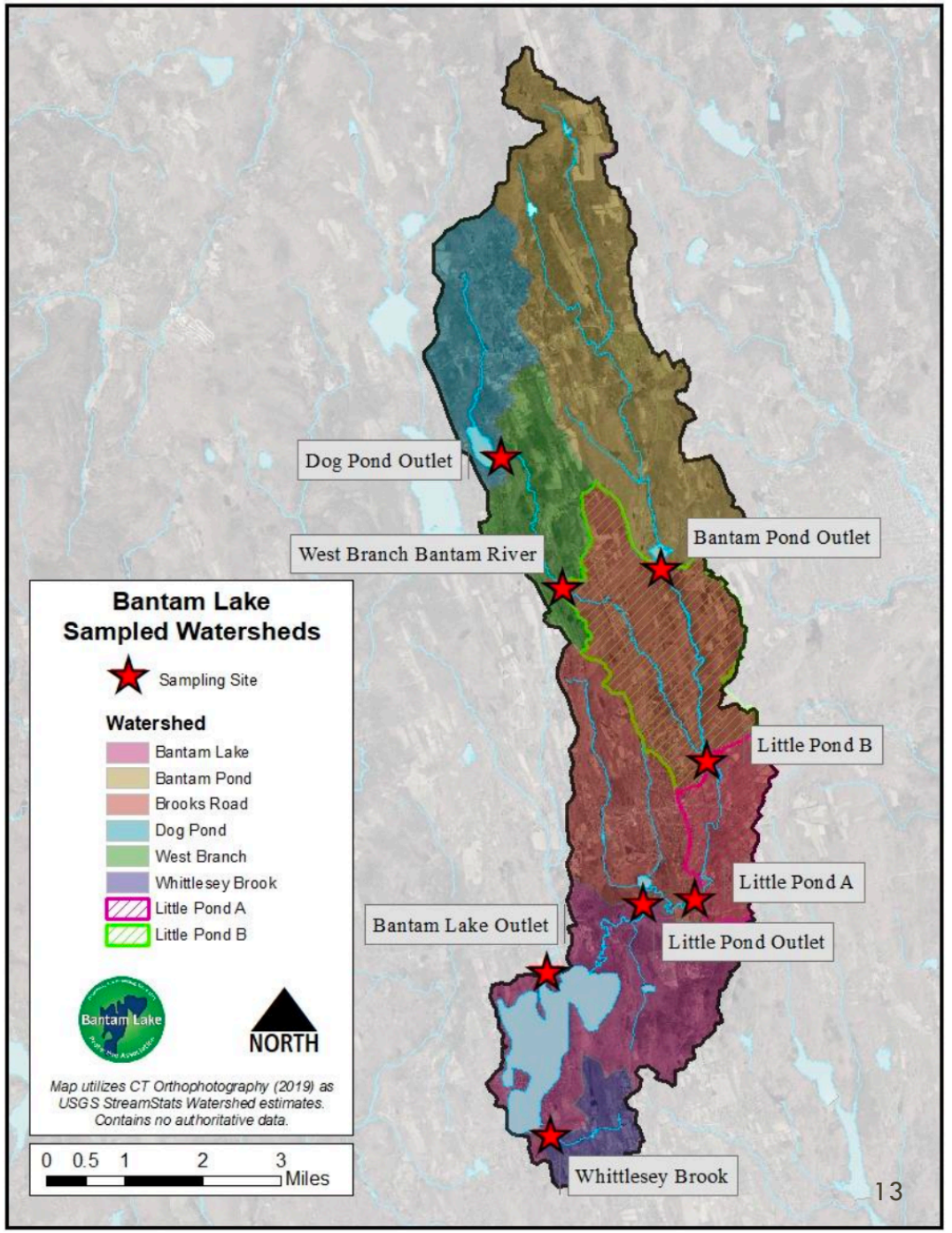
BANTAM LAKE WATER

- 21,000 acres
- Morris, Litchfield, Goshen and Torrington
- Watershed contributes 7.6 trillion gallons of water from April – October
- Nutrients from the watershed impact water quality of Bantam Lake
- CT DEEP listed the lake as an impaired water body and set goals for restoration focused on nutrient loading (TMDL Report) and data collection throughout the watershed



WATERSHED DATA

- Initiated Watershed data collection in 2023; following recommendation from the TMDL report
- Started with 6 sites
  - Recently added 2 additional sites
- Helps to identify sources of nutrient loading in the watershed and ultimately the lake
- Requires 3-4 years of data collection for robust data analysis
- Early trends on phosphorus and nitrogen loading:
  - Little Pond Outlet statistically higher average
  - Bantam Pond Outlet statistically higher than other sites
  - West Branch statistically higher when corrected for acreage



BANTAM WATERSHED COALITION

- White Memorial Foundation
  - Lukas Hyder, Executive Director
  - Michael Berry, Forest Manager
- Northwest Conservation District
  - Cynthia Rabinowitz (previous Exec Director)
  - Kelsey Sudol, Natural Resource Specialist
- Sustainable Litchfield
  - Dean Birdsall, Litchfield Land Trust
- Rivers Alliance of CT
  - Alicea Charamut, Executive Director
- Housatonic Valley Association
  - Michael Jastremski, Watershed Conservation Director
  - Jillian Gunderson, NY/CT Restoration Coordinator
- Bantam Lake Protective Association
  - Connie Trolle
  - Emily Lupinacci
  - Debi Smiley

BANTAM WATERSHED COALITION OBJECTIVES

1. Collect and understand watershed data on nutrients and invasive weeds and how they impact water quality of Bantam Lake and Bantam Lake Watershed

2. Work with key stakeholders to align objectives and priorities for improving water quality within the watershed; identify and prioritize structural improvements, funding, grants, etc.

3. Education across all stakeholders and community members to foster an understanding of best practices and projects that can help to improve water quality in the watershed and in Bantam Lake

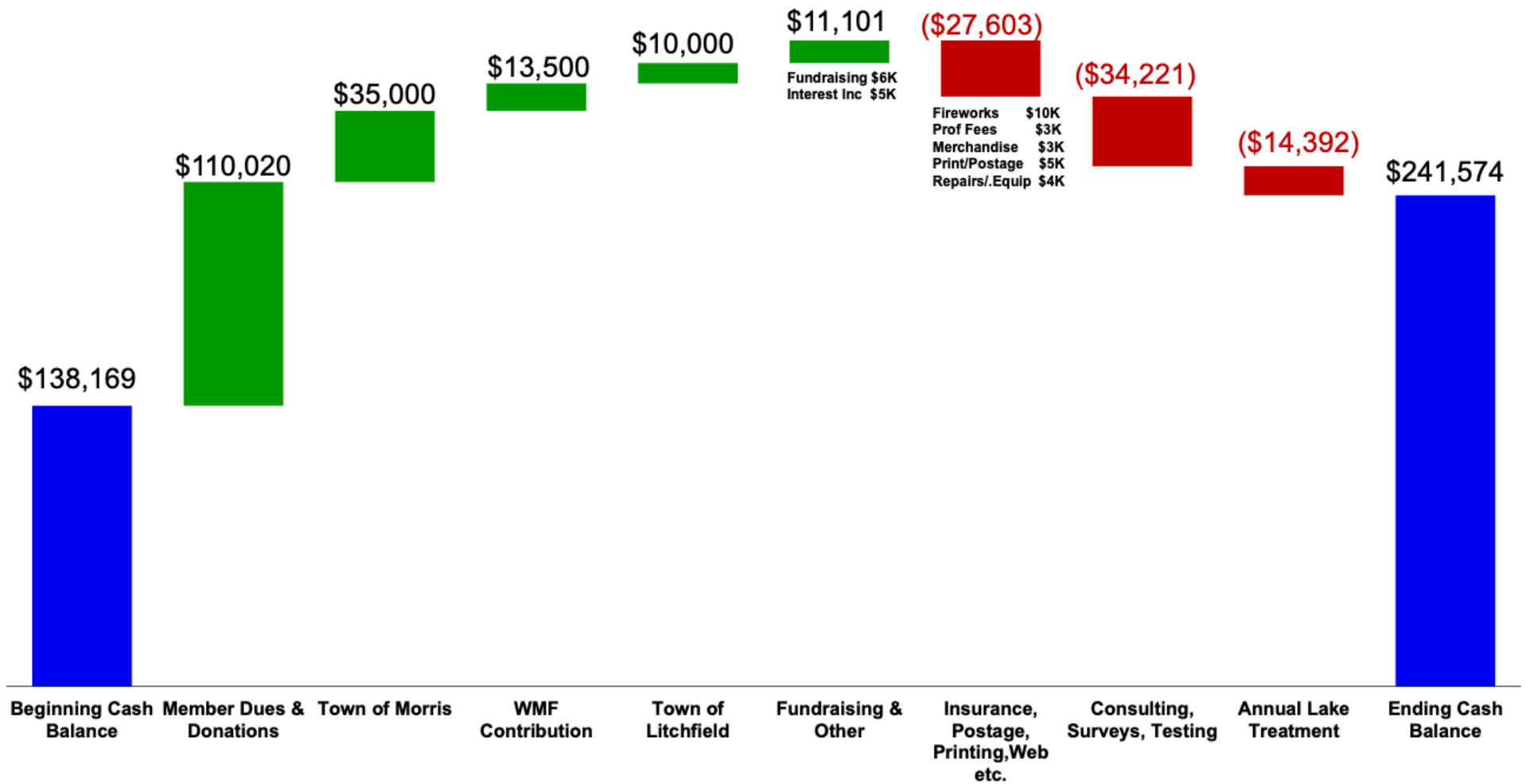
WATERSHED COALITION PRIORITIES 2025

- Watershed Survey/analysis to identify opportunities/priorities for improvements in the watershed
  - TMDL identified 20 sites for structural improvements – many projects/grants in process
  - Original focus was on the Southern end of the Watershed, new survey will expand across the full watershed
- Coordination with DEEP – regular meetings to share data, efforts, priorities and funding opportunities
- Advocate for change at potential phosphorus loading locations including sewer plants/systems, country clubs, etc.
- Education

BANTAM LAKE PROTECTIVE ASSOCIATION

6/29/24 to 5/31/25 - Financial Activity

($)



WHAT YOU CAN DO

- Advocate: help us spread the word about membership, donations and sponsor opportunities
- Take the Pledge!
  - https://www.bantamlakect.com/bantam-watershed-protection-pledge
- Plant buffers on the edge of property lines that connect with the lake and watershed
- Stay informed: Follow-us on Instagram and on our website for updates especially cyanobacteria information throughout the summer

- In the event of dangerous algae blooms; stop sign will be posted and sent via email to our membership list
- Chemical treatments and lake advisory also shared through social media, website and member emails

Limit use of fertilizer in your lawn or garden.

Increase vegetation along shorelines (streams, ponds or lakes) or add native plants to your yard.

Learn to identify CT's aquatic invasive species and prevent the spread by thoroughly checking your boat & equipment.

Keep litter out of your yard and "leave no trace" when visiting lakes, streams, rivers & trails.

Reduce water usage during times of drought.

Prevent septic system pollution with regular maintenance, inspection & pumping.

Allow water to soak into the ground, where it can be filtered before returning to the waterbody.

Dispose of pet waste properly.

Deter geese populations from your shoreline property.

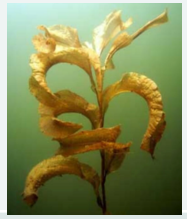
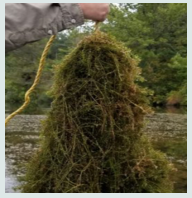
Stay informed!

APPENDIX

BLPA DATA COLLECTION AND REPORTS

Reports/Data	Date	Contractor	Purpose
In-Lake Data Collection *Annual data collection past decade plus*	April – Oct	Brawley Consulting Group	• Collects key nutrients (phosphorus/nitrogen etc, chlorophylly, alkalinity, Secchi transparency and Cyanobacteria cells and other key data • informs real-time safety of the water quality for recreational use
2024 Bantam Lake Water Quality Monitoring Report *Annual Report from annual in-lake data collection*	Feb 2025	Brawley Consulting Group	• Summary of data collected in-lake, annual Trophic Assessment • Historical comparisons, cyanobacteria growth and evaluation of treatments • Conditions vs TMDL Goals
Bantam Lake 2024 Annual Report *Annual report of invasive/non-native plants and treatments*	Jan 2025	SŌLitude	• Summary of in-lake surveys and treatments throughout the season to assess invasive and non-native weeds (including algae/cyanobacteria) • Recommendations for future planning and treatments for following season
CT Statewide TMDL Core Document *Federal Clean Water Act requires states to have a plan and implementation process for restoring clean waters*	Dec. 2021	CT DEEP	• Water quality standards, point and non–point source pollution, total maximum daily load of nutrients, watershed-based plans/implementation and BMPs (Best Mgmt Practices)
CT TMDL Appendix 1: **Bantam Lake Watershed TMDL** *CT largest lake; designated impaired, State required to have a plan to address water quality*	Dec. 2021	CT DEEP	• Potential Sources of nutrients within Bantam Lake Watershed impacting the lake • Nutrient load goals & reduction targets for the lake • Recommendations on additional monitoring/data collection (in-lake/watershed)
Bantam Lake Sediment Study *One time study to determine if Alum would be an appropriate treatment for in-lake nutrient loading*	April 2023	Aquatic Ecosystems Research	• Analysis of internal loading of nutrients from within the lake; confirmed significant internal loading of phosphorus • Recommended a two-tiered treatment with very high alum dosage of 75-100 g/m3 to achieve a target phosphorus level of < 50 mg/k @ $2.6M
Watershed Collection *Started in 2023 based on TMDL recommendation to collect watershed data*	April – Oct 2023 April – Oct 2024	Brawley Consulting Group	• 2023 collected data from 6 sites within the watershed • 2024 collected data from 8 sites within the watershed
2024 Watershed Water Quality Monitoring Report *New Annual report based on initiating watershed data collection in 2023*	April 2025	Brawley Consulting Group	• Summary of all data collected and informs on significant trends related to nutrient loading from various sites within the watershed • Provides insights into potential sites for remediation/nutrient reductions • State recommended at least 3 year's worth of data for accurate analysis

INVASIVE WEEDS OVERVIEW

How to Identify	Weed	Location	Treatment
	Eurasion Milfoil *(non-native)*	Morris Boat Ramp, Nic's Cove, Outlet Cove, North Bay and White Memorial Marina	Herbicide *(Hard to treat due to proximity of endangered water marigold)*
	Curley-leaf pondweed *(non-native)*	State Boat Ramp and Outlet Cove	Herbicide
	Fanwort	No Fanwort observed in 2024 survey	Herbicide *(usually sourced from river)*
	Large-leaf pondweed *(native)*	Throughout the lake	Herbicide
	Hydrilla	Currently not seen in Bantam Lake; HIGHLY INVASIVE typically starts with boats carrying from other water bodies	No known treatment; efforts need to focus on prevention

TREATMENTS TO ADDRESS ALGAE & PHOSPHORUS

Treatment	Details	Cost
Storm water mgmt., shoreline stabilization	Implement stormwater best mgmt. practices (BMPs) to reduce the speed and volume of runoff and clean pollutants.	Simple and inexpensive; plant vegetation next to waters edge to protect water quality, rain gardens, etc.
Copper Sulfate	Widely used algaecide for treating algae. Effective in reducing density of algae and improving water quality. Can accumulate in lake sediments and have negative long-term impacts.	$18K per treatment; typically applied 1-2x per season
Hydrogen Peroxide	Studies have shown it to be effective in reducing algae blooms, works by oxidizing and damaging the cells walls of algae suppressing growth. Does not address the underlying cause of nutrient pollution.	$150K per treatment, benefit expected to last 3 years
Aluminum sulfate (alum)	Forms a floc that binds with phosphorus, settles to lake bottom and prevents phosphorus from being recycled into the water column (limits internal loading).	$2.6M – lasts 5-20 years or longer
Dredging	Highly effective for reducing phosphorus levels in lakes by removing sediment containing high concentrations of phosphorus.	$2M plus