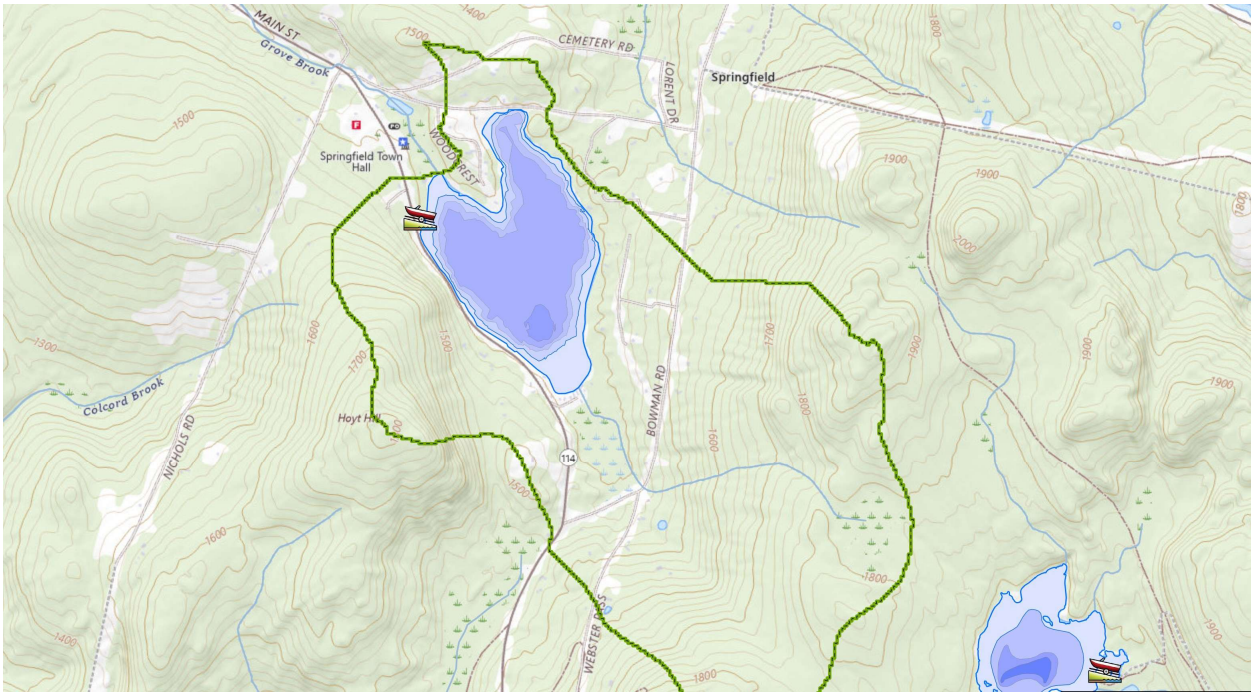
KOLELEMOOK LAKE PROTECTIVE ASSOCIATION

CASE FOR COMPREHENSIVE WATERSHED PLAN



October 17, 2025

The Kolelemook Lake Protective Association (KLPA) is a non-profit entity dedicated to the preservation of Kolelemook Lake water quality and stewardship of its watershed and surrounding lake shore.

Over the past few years, the KLPA Board have met with fellow lake associations representing Tucker Pond, Greg Lake and Kezar Lake to learn from their experiences in developing and funding a watershed management plan. We have also attended numerous seminars at the annual Lake Congress and webinars sponsored by NH Lakes regarding these issues. The following leans heavily on what we have learned from these organizations.

Section 1: Why a Watershed Management Plan?

Brief Overview of Kolelemook Lake Watershed

The Environmental Protection Agency (EPA) defines a Watershed as a land surface area that drains to a common waterway, such as a stream, lake, estuary, wetland, aquifer or even an ocean.

As depicted on the cover page, the Kolelemook Lake watershed predominately flows from the southern tip towards the northern end, with additional runoff from high ground on the southeastern and western borders. Kolelemook Lake is part of the Sugar River watershed, which is a sub-watershed of the larger Connecticut River watershed. The Sugar River flows into the Connecticut River, and Kolelemook Lake is one of many water bodies within the Sugar River's drainage area.

Kolelemook Lake Water Quality Testing Results

Monthly water observation and sampling are completed by KLPA volunteers usually between June and September of each year. Volunteers use a Secchi Disk to measure water transparency and take water samples at two different depths to be analyzed.

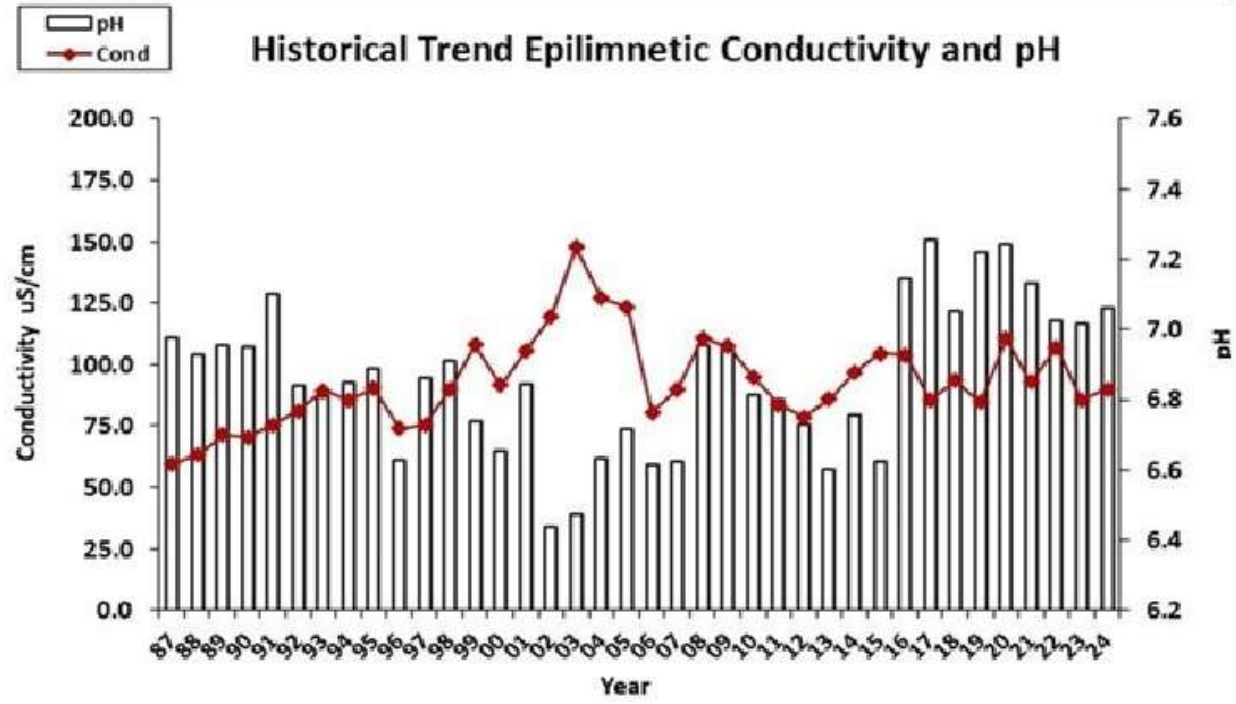
Information and samples are sent to the Lake Sunapee Protective Association (LSPA)Water Quality Lab at Colby Sawyer College, a satellite lab of the New Hampshire Department of

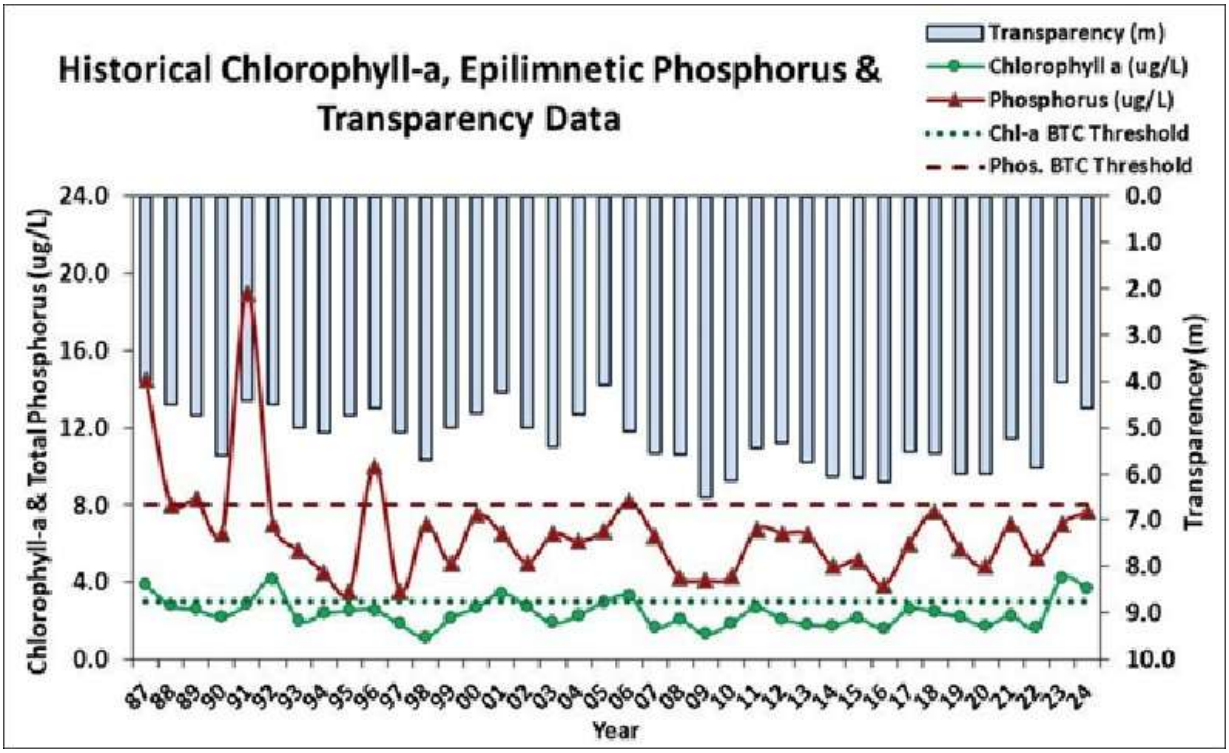
Environmental Services (NHDES) for analysis. We receive spreadsheets showing results on key data points and an annual Data Summary report from the NHDES as part of our participation in their Volunteer Lake Assessment Program (VLAP). Results are compared to median values of other NH lakes as well as various standard thresholds. Trend analysis is also performed as well as a narrative of observations and recommendations. Our trend analysis reports cover 35 years worth of data. See the full 2024 VLAP report for Lake Kolelemook in Appendix 1.

The following is taken from the Recommended Actions section of the 2024 VLAP Report for Kolelemook Lake, with ***emphasis added***:

> *Lake phosphorus levels remained representative of oligotrophic, or high-quality conditions, however,* ***algal growth was above the threshold for oligotrophic lakes and phytoplankton population data indicate cyanobacteria were dominant in the sample****.* ***Epilimnetic phosphorus levels were elevated in September following a significant storm event****. This highlights the importance of managing stormwater runoff, maintaining septic systems, establishing and maintaining shoreline buffers, and minimizing fertilizer use within the watershed. While conductivity has significantly increased since monitoring began, it appears to have stabilized since 2010.* ***Consider developing a watershed management plan to protect high quality waters.***

The graphs below were also taken from the 2024 VLAP report. They show high and worsening conductivity trend (red line on first graph) which is over twice the State median of 42.3 and recent higher trends of phosphorous and chlorophyll-a (solid red and green lines on the second graph, respectively) , reaching or exceeding thresholds (red dashed line and green dotted line).


pH
Cond
Historical Trend Epilimnetic Conductivity and pH
Conductivity uS/cm
pH
Year


Historical Chlorophyll-a, Epilimnetic Phosphorus & Transparency Data
Transparency (m)
Chlorophyll a (ug/L)
Phosphorus (ug/L)
Chl-a BTC Threshold
Phos. BTC Threshold
Chlorophyll-a & Total Phosphorus (ug/L)
Transparency (m)
Year

Cyanobacteria Threat

Cyanobacteria (formerly called blue-green algae) are photosynthetic bacteria that naturally occur in lakes, ponds, and rivers around the world. A cyanobacteria “bloom” is the name given to the excessive growth of cyanobacteria which can “pool” at the surface. Cyanobacteria can produce one or more types of cyanotoxins.

When cyanobacteria multiply to form a bloom, they can produce enough cyanotoxins to affect human and animal health. Exposure occurs through ingestion, inhalation or skin contact. Symptoms of exposure to cyanobacteria vary but can include skin irritation, stomach cramps, vomiting, nausea, diarrhea, fever, sore throat, headache, muscle and joint pain, mouth blisters, and acute liver damage. Long-term exposure can harm the liver and central nervous system.

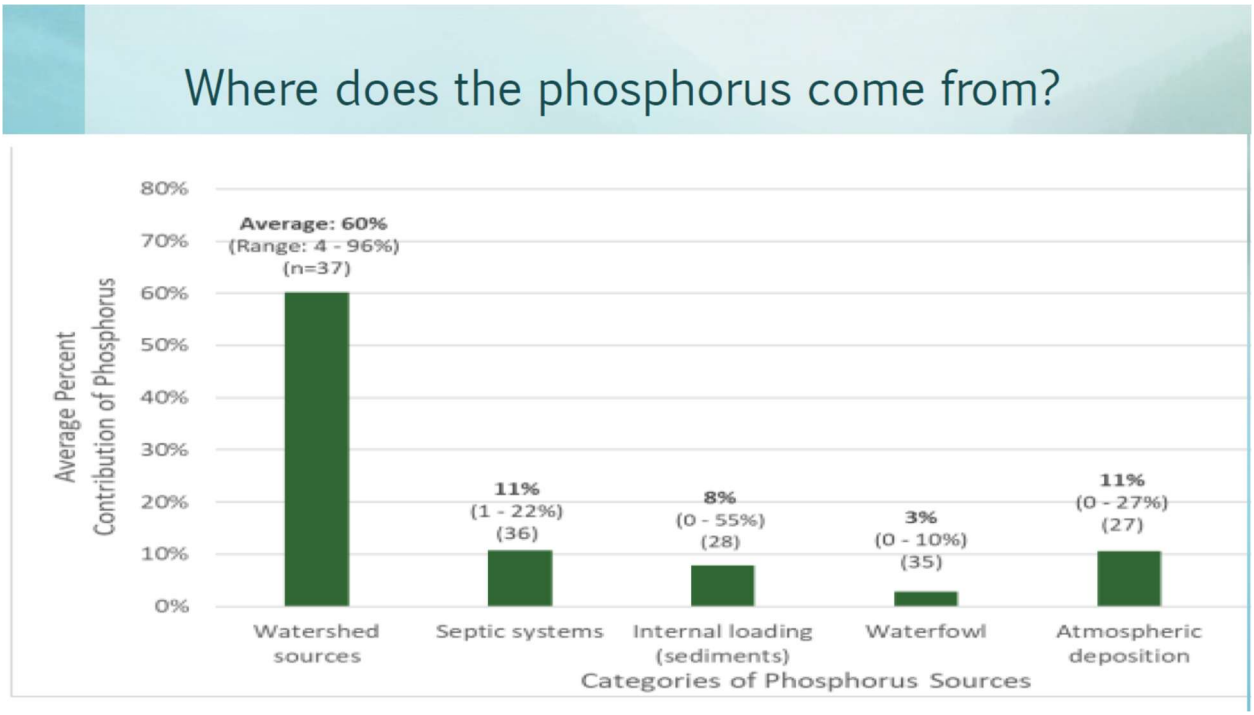
Cyanobacteria thrive in warm, nutrient-rich (predominately phosphorus and nitrogen) waters, with little water movement. Climate change and increased nutrient runoff are making blooms more frequent and severe in many lakes.

A look at the Healthy Swimmer map on 8/18/2025 shows observed cyanobacteria blooms on Kezar Lake, Lake Winnisquam, Squam Lake and Lake Winnipesaukee. Recent bloom reports have occurred on Little Sunapee, Pleasant and Sunapee Lakes. While every bloom is different, history has shown that toxic blooms could result in closure of affected areas from anywhere between 2 to 6 weeks.

Addressing Lake Kolelemook’s Lake Health

As noted in Lake Kolelemook’s 2024 VLAP Report, phosphorous, conductivity (measure of dissolved solids and minerals such as salts) and chlorophyll-a are generally increasing, and in some cases reaching thresholds. While we have been fortunate not to have observed any toxic blooms, current water condition trends are moving in a concerning direction. There is little we can do to adequately address the general warming of the lake’s ecosystem, which leaves management of the nutrients in our lake the best option to mitigate the potential for cyanobacteria blooms and other threats to maintaining a healthy, oligotrophic (a body of water that exhibits low nutrients, high oxygen content, and clear water) lake.

The following slide from a NHDES presentation shows the source of phosphorus in NH lakes:



The first two items represent 71% of the source of phosphorus in NH Lakes and is the most controllable by the actions of individuals, associations and local government. The Town of Springfield has begun to address the septic system source through its septic pumping and visual inspection health ordinance. This is a welcome and important step to address 11% of the source. However, we need to also address the watershed sources if we are to meaningfully manage the nutrients finding their way into Kolelemook Lake. The KLPA proposes to address the watershed sources two ways. First, expand our outreach to landowners of property abutting the lake to participate in the NHLakes Lake Smart program and achieve the individual LakeSmart Award for lake-friendly living. Second, as recommended in our 2024 VLAP report, commission a professional watershed study to produce a watershed management plan. The study will provide us with a better understanding of Kolelemook Lake's watershed, where the sources of nutrient runoff are, and how to best address nutrient reduction or remediation.

A comprehensive study will provide valuable information to the KLPA and town management. A clear map of the watershed can reveal vulnerabilities and recommend and prioritize remediation efforts. The plan also usually includes a build-out analysis. A build-out analysis is a planning tool that identifies areas with development potential and projects future development based on a set of conditions (e.g., zoning regulations, environmental constraints to

development) and assumptions (e.g., population growth rate). The results of the build-out analysis can be used for planning purposes to help guide future development activities in the watershed, as well as target specific areas for conservation.

Section 2: Funding a Watershed Study

We have not solicited a full request for proposal from qualified firms to obtain a hard cost for preparing a watershed management plan (WMP). We have reached out to a couple of firms to receive range estimates based on the size and nature of our known watershed and the VLAP information we already have. The small size of our lake and corresponding watershed along with our lengthy participation in VLAP will help mitigate the cost. One firm estimated $25,000 to $40,000 to produce a good watershed management plan. A second firm, recommended applying for the full $100,000 Clean Water State Revolving Fund (CWSRF) Loan to maximize value by going beyond the watershed management plan and anticipate other work, such as additional water quality monitoring and/or development of conceptual engineering designs for any stormwater or erosion issues found in the watershed, which can help support next phase grants to start implementing the watershed management plan.

Grant Sources

The NHDES administers two grant programs for projects addressing nonpoint source pollution (NPS) in which watershed management plan development are eligible. Nonpoint source pollution is considered contamination of water that does not originate from a single discrete source. These grants have limited amounts of annual funding and prioritize lakes with the greatest need.

Watershed Assistance 319 Grants

Funds for this grant are appropriated through the U.S. Environmental Protection Agency under Section 319 of the Clean Water Act. Approximately $500,000 of total grant money

is available. The grants are highly competitive and projects that restore impaired waters or protect high quality waters are usually prioritized. No match is required.

EPA Section 604(b) Water Quality Planning Grants

Between $60,000 to $150,000 is made available each year through a competitive application process (usually only one of two plans are selected each year) managed by the NHDES NPS Management Program. Funds are made available to NHDES through EPA pursuant to Section 603 (b) of the Clean Water Act. No match is required.

The New Hampshire Nonpoint Source Management Program is delaying the release of the 2026 Requests for Pre-proposals for Section 319 Watershed Assistance Grants and Section 604(b) Water Quality Planning Grants. This delay will remain in effect until NHDES has more certainty in the grant awards that will be provided by the Environmental Protection Agency (EPA) under Sections 319 and 604(b) of the Clean Water Act.

Clean Water State Revolving Fund (CWSRF)

The CWSRF provides low-cost financial assistance for planning, design and construction projects to protect public health and improve and protect water quality. Per the NHDES 2025 Intended Use Plan, the estimated funds available for this program was over $70.8 million. One of the stated short term goals of the CWSRF is to:

> *Offer Additional Subsidy (grants or forgivable loans) at or near 100% for asset management, and up to $100,000 for planning. Provide technical assistance and support for communities to develop projects and build the pipeline for future implementation of water quality improvements.*

Funding of Watershed Management Plans is covered under this program. The local municipality has to apply for the forgivable loan. If we were successful in obtaining a forgivable loan, we would only be required to pay interest on the loan amount. The current interest rate is 2%. The KLPA would be responsible for raising the funds and paying the interest due.

The CWSRF is a low cost, low risk method for towns to complete a Watershed Management Plan. Per the NHDES, the table below is a current list of NH towns taking advantage of the CWSRF program:

Below is a list of the Watershed Plans that have been selected for CWSRF funding. They are at various levels of completion; the completed projects are marked with an x in the completed column. The FY PPL column shows the year that the pre-application was selected. Some of these projects are updates to an existing plan, those projects are noted as such. Also note that they are called Watershed Management Plans (WMP), Watershed-based Plans (WBP) and Watershed Restoration Plans. These are all recognized as EPA nine element (a-i) plans.

Town	Project	FY PPL	Completed
Bedford	Sebbins Pond WMP	24	
Chesterfield	Spofford Lake Watershed Restoration Project Phase III (addition to an existing plan)	22	x
Derry	Big Island Pond WBP	22	very close
Derry	Hoods Pond WBP and Lake Phosphorus Control Plan	22	x
Hollis	Silver Lake WBP	23	
Kingston	Kingston Lake WBP	22	x
Lebanon	Macsoma Lake WBP	23	
Littleton	Partridge Lake WBP	19	x
Madison	Silver Lake WBP	24	
Meredith	Lake Waukewan Watershed Restoration Plan Update	24	
Pelham	Long Pond WBP	24	
Raymond	Governors Lake WBP	23	
Salem	Captain Pond WMP Update	23	
Sunapee	Perkins Pond WMP	23	
Sutton	Kezar Lake WBP	23	
Tuftonboro	Mirror Lake WBP Update	24	
Wolfeboro	Wolfeboro Bay Watershed Management Plan	21	x

The steps to obtain a CWSRF forgivable loan are broadly itemized as follows (per conversation with NHDES staff):

1. Obtain town support
2. Town proposes warrant article to approve full $100,000 loan plus interest. Lake Association provides education and outreach to voters in support of approving warrant article. While a passed warrant article is not required before the pre-application is submitted, it is highly recommended since it increases the score on the pre-application.
3. Pre-Application – Due May 31st. Includes a ranking criteria to help NHDES prioritize submissions.

4. NHDES ranks projects and prepares Project Priority List – usually released in June or July and how and when you find out if you are granted funding
5. If granted funding under step 4, town prepares loan application.
6. Loan agreement is prepared by NHDES and signed by town
7. Project starts

Section 3: Recommendation

Thus far, Kolelemook Lake's overall water quality has been very good and shows many signs as a healthy lake. However, water sampling trends and emerging issues in surrounding lakes such as the emergence of cyanobacteria blooms, have heightened the importance of managing the nutrient pollution entering the lake. A comprehensive Watershed Management Plan with actionable remediation recommendations is the first step to attaining this goal.

While the good news is that Kolelemook Lake is better off than most of other NH lakes, the bad news is that when applying for grants and other limited funding, Kolelemook Lake will most likely find itself low on the priority list. The CWSRF appears to be our best option, even though we are not guaranteed to be included in the NHDES Project Priority List.

It is worth the effort to apply for a forgivable loan sooner rather than later and get the process started. We should not wait until we observe Cyanobacteria blooms on the lake. KLPA recommends we start the effort to reduce this likelihood now, rather than wait and play catch up. It may take a few iterations to get approved but the sooner the better.