

Bow Lake | Shoreline Survey Results



TO: Lisa Murphy, Strafford Regional Planning Commission
FROM: Mindee Goodrum, FB Environmental Associates
SUBJECT: **Bow Lake Shoreline Survey Results**
DATE: September 29, 2026
CC: Tim Kirsten, FB Environmental Associates

FB Environmental Associates (FBE) was contracted by the Strafford Regional Planning Commission (SRPC) to conduct a shoreline survey of Bow Lake as part of the first phase in developing a watershed management plan. The survey was completed on July 1, 2026, by FBE Project Manager Mindee Goodrum and FBE Technical Staff Tim Kirsten, alongside volunteers Roger Belanger and Howard Hansen who provided boating assistance for surveying the waterfront parcels. Roger Belanger surveyed an additional 32 parcels by himself from a canoe; these sites were inaccessible by motorized boat because of the obstructions of Bennett Bridge Road and Bow Lake East Road. FBE staff provided quality assurance review of the scoring of these additional parcels to ensure consistency.

FBE staff documented the condition of the shoreline for each parcel using a scoring system that evaluates vegetated buffer, presence of bare soil, extent of shoreline erosion, distance of structures to the lake, and slope. These scores were summed to generate an overall "Shoreline Disturbance Score" (scores ranging from 3-12) and "Shoreline Vulnerability Score" (scores ranging from 1-6) for each parcel, with high scores indicating poor or vulnerable shoreline conditions. Photos were taken at every parcel where feasible, and were cataloged by tax map-lot number. These photos will provide project stakeholders with a valuable tool for assessing shoreline conditions over time. It is recommended that a shoreline survey be conducted in mid-summer every five years to evaluate changing conditions.

RESULTS

A total of 375 parcels were evaluated along the shoreline of Bow Lake in Strafford and Northwood, NH. The average Shoreline Disturbance Score (based on vegetated buffers, amount of bare soil, and visible shoreline erosion) for the entire study area was 5.84 (Table 1). About 37% of the shoreline (or 137 parcels) scored 7 or greater (Figure 1). A disturbance score of 7 or above indicates shoreline conditions that may be detrimental to lake water quality. These shoreline properties tended to have inadequate buffers, evidence of bare soil or use of lawn fertilizer, and shoreline erosion. The average Shoreline Vulnerability Score (based on structure distance and slope of the land) was 3.50 (Table 1). About 60% (or 226 parcels) scored 4 or greater (Figure 2). A vulnerability score of 4 or greater indicates that the parcel may have a home less than 150 feet from the shoreline and a moderate or steep slope to the shoreline. Parcels with a vulnerability score of 4 or greater are more prone to erosion issues whether or not adequate buffers and soil coverage practices are maintained. Many parcels are particularly prone to erosion for having a house close to the shoreline, with 177 parcels (47%) having a house within 75 feet of the shoreline. In summary, the overall average shoreline condition of Bow Lake is relatively good (average

disturbance score below 6), but it is on the borderline of poor conditions with an average shoreline disturbance of 5.84. Improvements can be made with 137 properties (37%) needing to address erosion or runoff issues that are impacting the lake. Refer to the end of this document for a map of the scores by parcel.

Note: when evaluating the shoreline condition of each parcel, we consider the entire length of each parcel's shoreline. Because of this approach, the same shorefront home would score better on a parcel with a long shoreline that was mostly natural buffer compared to on a parcel with a short shoreline that consisted mostly of the developed area.

The pollutant loading estimates are based on the Shoreline Disturbance Scores. The 137 parcels with scores 7-12 are contributing approximately 106 lbs of phosphorus annually¹. Remediation efforts on all properties using a 50% Best Management Practices (BMP) efficiency rate could result in an annual reduction of 53 lbs of phosphorus. **The annual phosphorus contribution is moderate, indicating that the shoreline properties on Bow Lake are relatively good but significant improvements can be made and nutrient loads reduced to help meet water quality targets.**

Table 1. Average scores for each evaluated condition criterion and the average Shoreline Disturbance Score and average Shoreline Vulnerability Score for Bow Lake. Lower values indicate shoreline conditions that are effective at reducing erosion and keeping excess nutrients out of the lake. Note: the numbers in parentheses are the range of possible scores for that variable.

Score Type	Evaluated Condition	Average Condition	Score Type Average
Shoreline Disturbance Score (3-12)	Buffer (1-5)	2.85	5.84
	Bare Soil (1-4)	1.81	
	Shoreline Erosion (1-3)	1.18	
Shoreline Vulnerability Score (1-6)	Distance (0-3)	2.07	3.50
	Slope (1-3)	1.43	

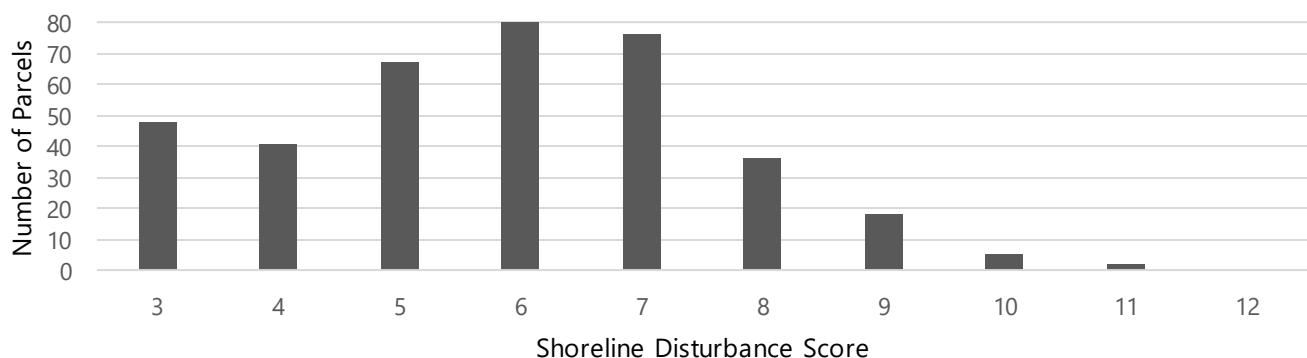


Figure 1. Histogram showing the number of parcels by Shoreline Disturbance Score for Bow Lake. The possible range of Shoreline Disturbance Scores is 3-12.

¹ Based on PLET model bank stabilization estimate for fine sandy loams, using 50 ft or 100 ft or 200 ft (length) by 3 ft (height) and moderate lateral recession rate of 0.1 ft/yr.

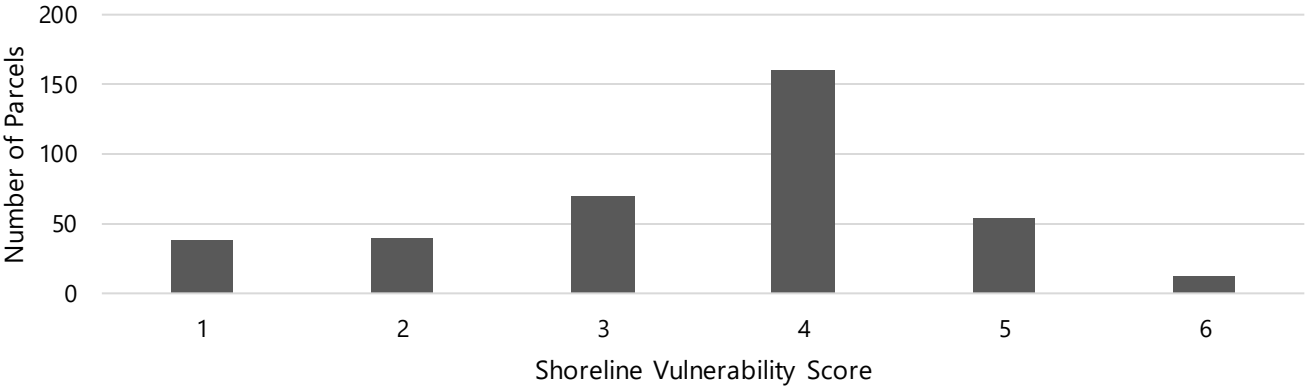
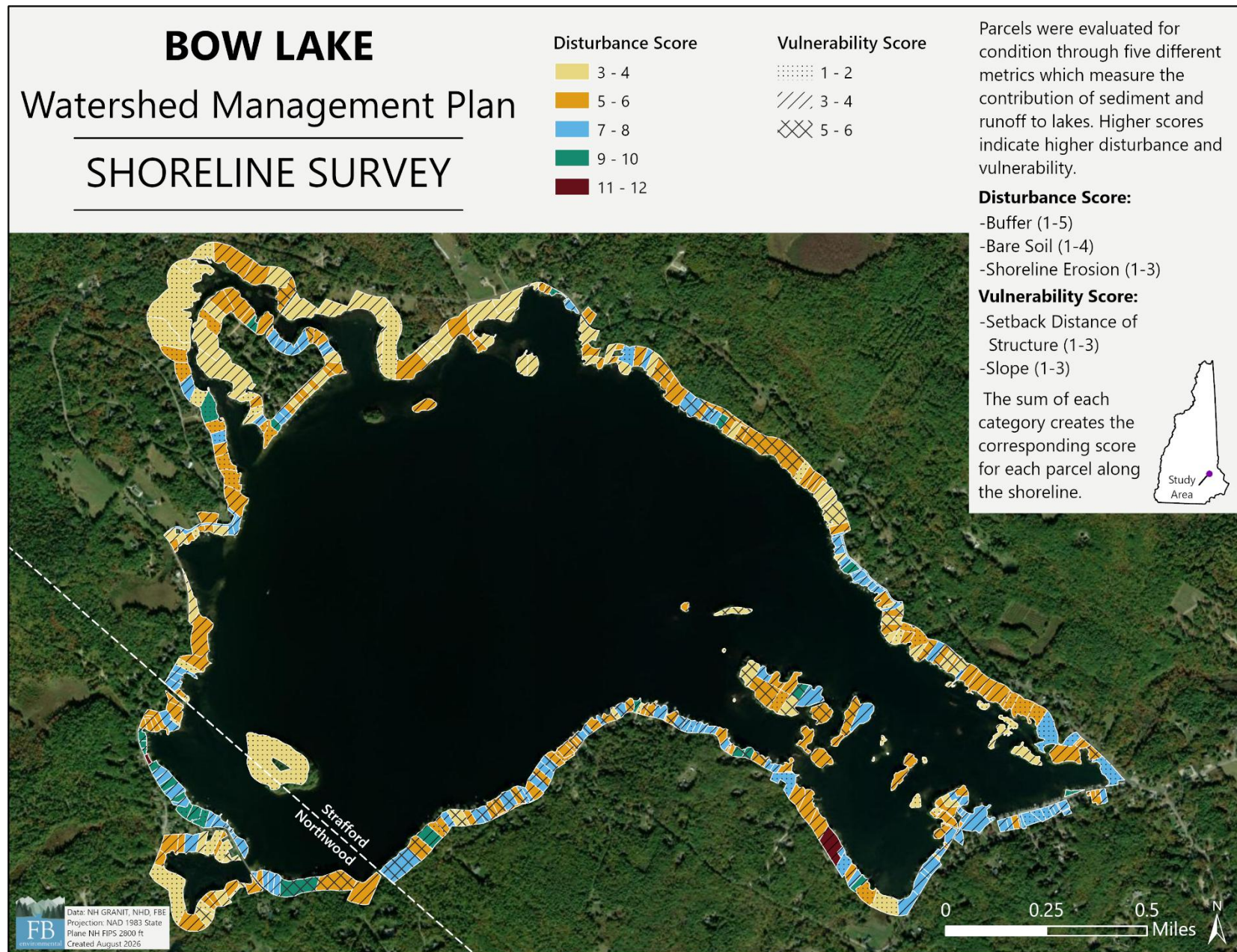


Figure 2. Histogram showing the number of parcels by Shoreline Vulnerability Score for Bow Lake. The possible range of Shoreline Vulnerability Scores is 1-6.



Map 1. Map of shoreline survey results for the shoreland zone of each parcel (within 250 feet of the lake).

NEXT STEPS AND RECOMMENDATIONS

The information obtained from this survey will be used to plan next steps for improving the shoreline of Bow Lake and further inform the watershed management plan. The survey map and database highlight areas that are possibly contributing to polluted runoff, and the shoreline scores should be used to prioritize areas of the shoreline for remediation. Educating neighbors and leading by example is a great way to help each other maintain the shoreline in its current state and prevent any future negative impacts shoreline properties may have on the lake. We recommend that the Bow Lake Master Plan Committee continues to monitor for lack of buffers, bare soil, and shoreline erosion, and to work collaboratively with landowners to provide educational resources and work together.

Recommendations include reducing residential stormwater runoff and improving shoreline vegetated buffers. Homeowners should employ stormwater SCMs to infiltrate stormwater runoff prior to reaching the waterfront area of their properties. One of the best actions each shoreline homeowner can take is to look at their own property while it is raining to see where water flows. SCMs may include rain gardens, water bars, drip lines, and more. Refer to the [New Hampshire Soak up the Rain Program](#) for examples of stormwater infiltration practices and instructions for installation. The goal is to infiltrate stormwater rather than letting it flow across the surface and into the lake. The committee should also encourage landowners to plant and/or maintain vegetated buffers as an SCM along their shoreline, particularly in areas of bare soil. This will help stabilize the shoreline, mitigate erosion, and reduce sediment and nutrient loading to the lake. Landowners should be encouraged to revegetate their shoreline buffers with native plants, avoid large grassy lawns, increase mower blade height to 4 inches, and avoid bringing in sand to replenish beaches. Woody vegetation with deep rooting structures stabilizes banks and intercepts water flow, allowing it to spread out, slow down, and be filtered by the soil. [Native shrubs](#) planted along the shoreline such as blueberry, willows, elderberry, viburnums, dogwoods, winterberry, buttonbush, pepperbush, serviceberry, swamp azalea, and leatherleaf are great options. Digging small holes for shrubs and plants along the shoreline represents minimal temporary impacts from exposed soil and is therefore consistent with DES guidelines for shorefront protection and management guidelines. Many of these species can also be planted as live stakes with minimal ground disturbance.

The shoreline survey should be repeated every 5-10 years to monitor improvements and to continue to allocate resources appropriately. Site-specific recommendations should be made for each lot following a site visit by a trained volunteer or by a representative through the NH LAKES [LakeSmart Program](#).



Examples of shoreline properties with well-vegetated buffers consisting of multi-story canopies (trees and shrubs) and minimal exposed soil.