

Effects of liming on lake shoreline plant communities

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Acid rain caused by the release of industrial pollutants particularly from the northeastern United States has greatly impacted eastern Canada, where ecosystems in provinces such as Nova Scotia have a naturally low buffering capacity with little capability to neutralize acid in both land and water ecosystems. This historical acid deposition has resulted in the destruction of life in lakes and rivers, the inhibition of growth in forests, and high levels of soil and water acidity that persist to this day. A solution to combat the acidity of Nova Scotia's aquatic habitats is liming, which involves the addition of powdered limestone to a waterway to restore its natural pH and calcium availability to the associated aquatic ecosystem. However, the impact of broadscale liming on the numerous non-competitive Atlantic coastal plain or acid-adapted plant species that inhabit Nova Scotian lakeshores is uncertain. These species occupy a narrow niche, leaving them open to potentially being outcompeted after alteration to their environment. Therefore, our study seeks to determine what impact the application of lime has on Nova Scotia lakeshore plant species diversity, abundance, and physiology. We are conducting a field experiment focusing on analyzing the abundance and composition of plant species before, during, and after exposure to lime at Second Christopher Lake in Queens County, Nova Scotia. We are applying four treatments (control plus three lime concentrations of 0.5, 1.0, 1.5 kg/m²) to 24 transects that span the length of the shoreline. Preliminary results from our first field season prior to lime application reveal that the soils are acidic (pH <5) and Ca-deficient (<24ppm). We observed 44 plant species, including many Atlantic coastal plain species such as Blue-eyed grass (*Sisyrinchium atlanticum*), Bayonet rush (*Juncus militaris*), and Eaton's panic grass (*Dichanthelium spretum*). In addition to species composition, we will also measure leaf carbon and nitrogen content and stable isotope composition to assess plant physiological responses.

Key words: Plant ecology, restoration, acid, Atlantic coastal plain

Poster presentation