

***Soils Team: Mounding alters  
nutrient cycling in peatlands that  
may change competition***

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**Project Summary**

The project aims to examine the impacts of seismic lines and different restoration techniques on soil quality and vegetation recovery. Specifically, the objectives of this project are to 1) compare soil physical and chemical properties of unrestored seismic lines and seismic lines restored in different years, 2) examine the impact of different mounding treatments on soil properties directly after restoration and 3) to examine plant nutrient, nitrogen (N) and phosphorus (P) responses on seismic lines. The study of different mounding treatments is planned to occur in Fall 2020. Unrestored seismic lines and natural areas had comparable soil bulk density and organic matter content. Following restoration, seismic lines were more compacted with lower organic matter content. Both unrestored and restored seismic lines were wetter than the surrounding area. At the microsite level, mounds were found to be drier than the low-lying areas on the lines but more compacted with low organic matter. Less negative soil  $\delta^{15}\text{N}$  on seismic lines indicated a change in N form and a potential loss in available N. However, soil total N (TN) increased slightly on seismic lines and recent mounds. Soil TP was similar in all conditions. Changes in foliar nutrients varied between species. Labrador tea foliar TN and TP increased slightly on restored seismic lines while black spruce TN and TP did not change.

**Management Implications and Lessons Learned**

The current mounding technique of inverting the soil profile has been found to impact soil physical and chemical properties and likely hinder the recovery of vegetation. Although mounds may serve to create drier microsites for trees, current mounding methods further decrease soil quality by exposing older, more decomposed peat. The different responses of Labrador tea and black spruce nutrient content and stable isotope compositions may reflect a competitive advantage of Labrador tea over black spruce. While Labrador tea re-establishes quickly on seismic lines, black spruce struggle to establish. Upcoming research will be focused on testing new mounding methods of keeping the peat profile intact to improve restoration success. Upright mounds will allow any re-established vegetation to survive instead of burying vegetation and exposing heavily decomposed peat. Additionally, upright mounding is predicted to reduce compaction while still providing a drier microsite for conifer growth.

**Publication(s)**

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