

Vegetation Team: Seismic Lines Simplify Microtopography in Peatlands

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Project Summary

The mechanized creation of seismic lines is thought to depress and simplify microtopography, leading to reductions in tree regeneration through removal of microsites. These alterations in microtopography are thought to be a key cause of regeneration failure in treed peatlands primarily from flooding. The objectives of this study were to compare microtopography between seismic lines and adjacent forest controls and assess whether microtopography affects tree regeneration. We used a ZIPLEVEL PRO-2000 High Precision Altimeter to measure the elevation profile (25 cm increments) of seismic lines (longitudinal and perpendicular profiles) and how this differs from adjacent forests. Tree regeneration was measured within 1-m wide belt quadrats along these same transects. Results demonstrate that seismic lines have on average 20% less microtopographic variation and 8 cm depressions. Fires do alter patterns of microtopography, but not to a significant degree. Although microtopography does influence tree regeneration, responses are complicated and often ecosite specific. Specifically, microtopography was most influential in fens, often altering areas initially dominated by trees to that of shrubs.



Management Implications and Lessons Learned

Seismic lines in treed peatlands are a major concern as they are the ecosites with the poorest recovery of trees. In many cases these sites stay open (treeless) for over 50 years. This work informs government and industry on where attention to microtopography should be focused for mounding treatments or if 'leave-for-natural' regeneration will occur. Most limitations to tree recovery on lines appears to be due to changes in depth-to-water caused by changes to microtopography.

Publication(s)

Stevenson, C.J., Filicetti, A.T., and Nielsen, S.E. (2019). High precision altimeter demonstrates simplification and depression of microtopography on seismic lines in treed peatlands. *Forests* 10(4), 295.