

Vegetation Team: Fire Promotes Recovery on Seismic Lines in Peatlands

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Project Summary

The world's forests are highly fragmented by linear disturbances, many of which have failed to recover decades after abandonment. Lack of recovery is common in unproductive forests, such as treed peatlands, due to conditions that limit tree growth, including simplification of microtopography (loss of microsites). The persistence of these features affects biodiversity, but of particular concern in Canada is the detrimental effects on threatened woodland caribou. Although natural regeneration of trees in peatlands occurs in some places, it is not an effective recovery strategy for restoring habitat of woodland caribou. This has led to restoration activities with costs exceeding \$12,500/km (CAD). However, current restoration does not consider wildfires that can destroy planted trees, but also initiate early seral conditions that favor natural regeneration. Here we compared tree regeneration on seismic lines and adjacent forest controls for burnt (75 sites) and unburnt (68 sites) treed peatlands in northeast Alberta, Canada. Tree regeneration (stems per ha with a DBH <1 cm) varied from 28,500 in burnt lines, 11,440 in unburnt lines, 18,210 in burnt forest, and 9,520 in unburnt forest. Wildfires promoted denser regeneration in sites with a greater proportion of serotinous species and water table depth. Microtopography and terrain wetness explained regeneration on burnt lines, but not unburnt lines. In burnt and unburnt lines, sunlight, microtopography, and depth of water table most affected tree regeneration patterns.



Management Implications and Lessons Learned

Results from this project will inform government and industry on where to focus reclamation efforts thus potentially saving reclamation costs by avoiding efforts where they are least effective or unnecessary. The examination of fires in treed peatlands in 2017 suggests that natural recovery (passive restoration) of seismic lines should be expected post-fire for bog and poor mesic ecosites. Restoration efforts in bogs and poor mesic sites are therefore not needed if recently burned or if fires are to be expected in the near term. Restoration efforts, such as mounding, should focus on poor and rich fens with the aim of addressing changes in microtopography.

Publication(s)

Filicetti, A.T., and Nielsen, S.E. (in revision). Tree regeneration on industrial linear disturbances in treed peatlands is hastened by wildfire, site, and stand characteristics. *Canadian Journal of Forest Research*.