2020 Project Summaries
Boreal Ecosystem Recovery & Assessment
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Vegetation Team: Fire Promotes Recovery on Seismic Lines in Mesic Forests

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Project Summary
Industry and government have been investigating the application of intensive silviculture treatments for seismic line restoration. However, these treatments are expensive (>$12,000/km) and do not account for wildfires. Here we compared burnt and unburnt tree recovery on seismic lines in upland aspen-dominated stands with that of adjacent (paired) forest controls in northeast Alberta, Canada. Tree regeneration more than doubled on burnt seismic lines compared to unburnt lines and was higher than undisturbed adjacent forests. Specifically, tree regeneration varied from 16,424 stems/ha in burnt lines, 6,867 stems/ha in unburnt lines, 18,904 stems/ha in adjacent burnt forest, and 12,039 stems/ha in adjacent unburnt forest. Soil bulk density was 1.4-times denser on seismic lines than adjacent forests suggesting compaction on lines, but this increase in bulk density did not appear to impede tree regeneration. We suggest that leave-for-natural recovery, or passive restoration, of seismic lines can be expected in post-fire aspen upland forests and thus active restoration activities (e.g. intensive silviculture treatments) should only be considered for areas where wildfires are unlikely.

Management Implications and Lessons Learned
Results from this project are informing 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 mesic aspen forests in 2018 suggests that natural recovery (passive restoration) of seismic lines should be expected post-fire for most of these sites. Restoration efforts in mesic aspen forests are not therefore needed if recent fires occurred or are in areas of lower restoration priority where restoration can wait for future wildfire-related recovery. Ground compaction (high bulk density) from mechanical creation of seismic lines and potential subsequent use by human activity does not appear to be a problem for most sites since it does not greatly affect tree regeneration in these forests even with observed increases in compaction.

Publication(s)
Filicetti, A. T., and Nielsen, S.E. (in prep). Aspen uplands response to linear disturbances and wildfire.