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Project summary

In-situ oil sands disturbances alter abiotic conditions, which influence tree regeneration and thereby affect forest recovery post-disturbance. Restoration practices such as mounding may provide microclimatic conditions suitable for sapling growth on seismic lines; however, the effects of mounding on the abiotic environment are unknown. The overall goal of this research project is to identify attributes of seismic lines that influence abiotic factors (i.e., light, temperature, humidity). The research objectives are: 1) to determine the effects of seismic line width and orientation on the abiotic environment; 2) to identify seismic line edge effects on abiotic factors; and 3) to investigate the effects of seismic line mounding treatments on the abiotic environment. Light, temperature, and humidity were measured on narrow (3-4 m) and wide (6-8 m) seismic lines oriented North-South and East-West (objective 1). These abiotic conditions were also measured at the seismic line-forest edge and at 5 m, 10 m, 15 m, and 25 m from the edge into the interior forest (objective 2). Temperature and humidity were recorded on the tops of mounds and in the level positions adjacent to mounds on mounded seismic lines (treated), on untreated seismic lines, and in interior forests (objective 3).

Progress to date

All data were collected June – August 2018. Data were collected at 24 sites for objectives 1 and 2 and at 10 sites for objective 3. Data analyses are ongoing and a manuscript should be completed by Spring 2019.

Management implications

This research contributes to a better understanding of the effects of seismic line width, orientation, and edge creation on light, temperature, and humidity. The results will provide insight into the abiotic factors influencing regeneration patterns and processes on seismic lines. The findings will also provide information on abiotic conditions of mounded seismic lines to ultimately help improve the effectiveness of restoration treatments in boreal landscapes affected by anthropogenic linear disturbances.

Geographic location

Sites for objectives 1 and 2 were located near Fort McMurray, Alberta, while sites for objective 3 were situated at the Kirby project near Conklin, Alberta.