FPInnovations
Wildfire Operations Research

PROJECT DESCRIPTION

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Black Spruce Fuel Amendment Treatment: Explorations at the Canadian Boreal Community FireSmart Project

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BACKGROUND

Alberta Agriculture and Forestry (AAF) has applied this fuel treatment technique in a mature lodgepole pine forest stand in a subalpine natural subregion. A feller buncher was used to create parallel machine trails and place the residue of stems and branches under the adjacent canopy. This resulted in a blended fuel environment made up of the mature lodgepole pine overstory and a surface fuel layer amended with fine and medium sized fuels from the cut stems. The amended fuel strips were ignited under moderate fire hazard conditions. During the prescribed fire, the amended surface fuel layer generated fire intensity sufficient to scorch aerial fuels and cause mortality in overstory stems.

ISSUE

Large expanses of black spruce fuels in Northwest Territories and other parts of Canada pose a major wildfire threat to communities and other values at risk. Conventional fuel treatment methods are expensive and fuels managers would like to explore opportunities to mitigate the risk of wildfire through innovations in fuels engineering and prescribed fire. Prescribed burning as a fuel treatment in black spruce fuels is very problematic. Black spruce fuels burn very well under high hazard conditions but the potential for escape fires is high. Under moderate hazard conditions fire intensity may not be sufficient to achieve the desired objectives of stand mortality.

High density black spruce forest stands are not suitable for using harvesting equipment so the use of alternative machinery such as dozers is being considered as a means to create a fuel amendment. Optimally, a black spruce fuel amendment treatment will be conducted on a landscape level using machinery such as dozers.

OBJECTIVE

The Canadian Boreal Community FireSmart (CBCFS) project site has a suitable stand of black spruce (Figure 1) to evaluate the fuel amendment process and test the effectiveness of this treatment. This treatment will be conducted on a stand scale and does not warrant the use of machinery. Prescribed fire under moderate fire hazard conditions will be applied in the amended fuels to document crown fire initiation, crown fuel consumption and overall mortality.

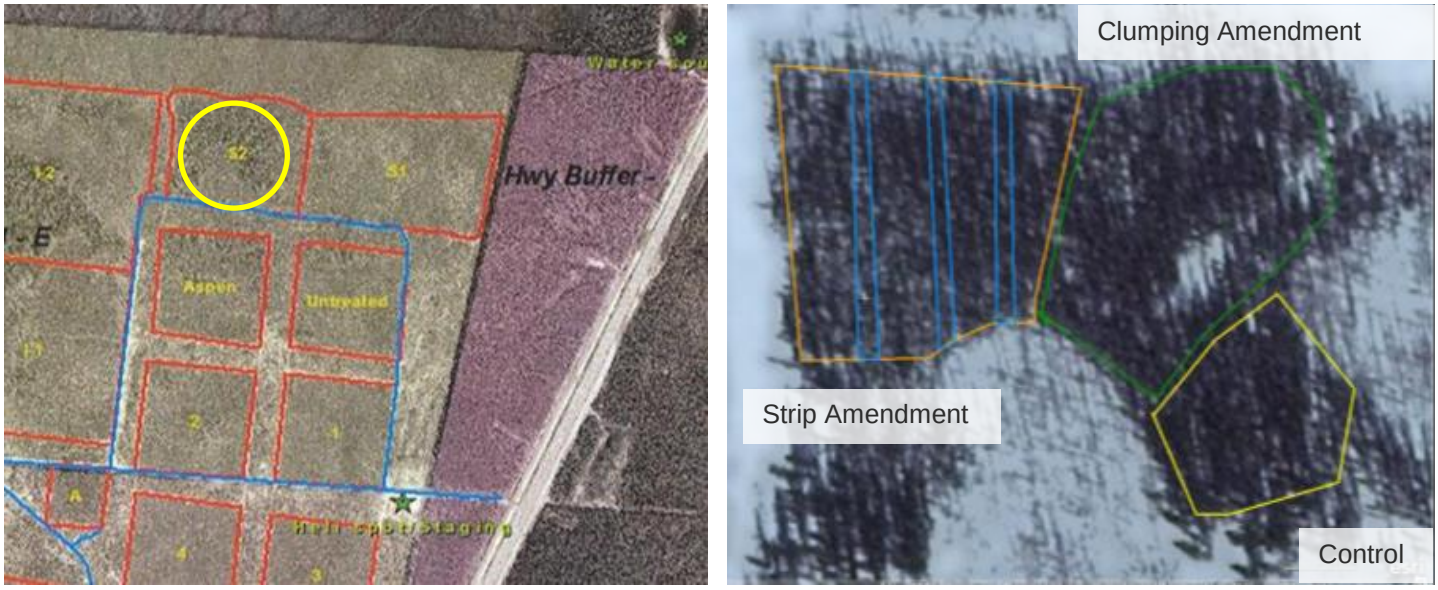

Figure 1. Project site map (left) and fuel amendment design (right).

METHODS

In August 2017, fire crews from Fort Providence started the strip amendment plot by cutting 4 to 5 m wide strips and piling the cut stems and debris against the remaining standing stems on both sides of the strips. In the spring of 2018, fire crews will complete the site preparation. The clumping amendment unit will be prepared by identifying clumps of trees to be retained and cutting and piling adjacent stems against the retained clumps.

Test burns will be conducted in the amended plots and the control unit under moderate fire hazard conditions to compare fire behaviour and crowning potential. The results of this prescribed will be evaluated and adjustments to the fuel amendment prescription will be applied in future fuel amendment experimental fire trials.

TIMELINES AND DELIVERABLES

- Continued treatment work is scheduled for July 2018; prescribed burning will be conducted in July 2019.
- An info note will be posted to the FPInnovations Wildfire Operations website following any future treatment work or prescribed burning.
- A technical report will be posted upon completion of the project.

COLLABORATING AGENCIES

Northwest Territories Environment and Natural Resources provides financial, logistical and operational support for this research project.