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Wildfire Operations Research
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Project Proposal Form

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Submission Date:

Oct 25, 2016

Proposal Number:

Champion:

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Background:

Abundant Black Spruce in northern Alberta pose a fire/smoke hazard to communities and industry. It is therefore desirable to remove black spruce in strategic locations to limit the impact of wildfire. The 2011 and 2015 fires in Alberta are good examples of challenges and loss caused by large tracts of burning spruce. Many of these stands have no commercial value so timber harvesting is not a viable way of removing fuel from the landscape. Fuel management treatments at the wildland urban interface scale (within 2 km of communities) are very costly. Obviously burning spruce is effective at removing fuel, but to do so safely is a challenge.

In 2011, Alberta conducted a prescribed fire in Kananaskis valley where the pine fuels had been modified to behave more like a slash fuel type. The rational was that the modified pine would burn at lower indices than natural pine and so could be burned when the natural pines would not. This tactic was called fuel amendment and involved using a feller buncher to cut 10-30% of the trees and place them in the understory. These cut trees were left on site and dried out for one season. The burn went as desired, creating a large landscape scale fuel break that was readily contained within the prescribed fire perimeter. Can similar tactics be used in Black Spruce?

Issue:

Alberta wants to safely and efficiently conduct fuel reduction prescribed burns in Black Spruce.

Objective(s):

Can modified black spruce stands be burned at indices that are too low to support intense fire (gt 4000 kw/m) in natural black spruce stands? The desired fire effect is to remove enough fine fuel so that a subsequent fire, under extreme conditions, would be limited to less than 4000 kw/m, and that smoke output from a subsequent fire could be limited.

1) What is the best fuel amendment treatment?
2) What are the relative costs?

Approach:

This problem can be worked on through outdoor testing and computer simulation.

1) Develop potential fuel amendment treatments – based on a balance of economics and effectiveness
    a. Mechanical – excavator or feller buncher
    b. Dozer
    c. Dozer/buncher combo
    d. Chemical – kill standing trees
2) Identify test plots at Pelican Mountain site, complete treatments
3) Conduct burn(s)
4) Simulate the burn using FireTec model
5) Assess fuel and conduct ignition tests in subsequent years

NOTE: This project proposal will be submitted to the AAF science and tech program for evaluation following the advisory meeting.