

Project Plan

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FPIinnovations 
Wildfire Operations Research
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Effectiveness of Stand Thinning as a Fuel Treatment in Jack pine/Black spruce

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Introduction

Forest fuel treatments have traditionally been promoted and accepted as a standard approach to reducing fuels to lessen wildfire risk in and around values-at-risk such as communities. Although fuel treatments are commonly understood as a positive measure, the application and effectiveness of these treatments have not been widely studied or documented. The absence of this science limits the ability of forest managers and practitioners to properly justify, prescribe, and conduct forest fuel treatments.

This project considers how stand-thinning affects fire behaviour. Stand-thinning involves the selective removal of overstory stems so that spacing between the remaining crowns is of a specified distance. Empirical research and modelling suggests that reducing the amount of flammable material in the forest canopy will cause a measurable decrease in fire intensity. Past work has shown that increasing the inter-crown spacing to 3m (as recommended by the Partners and Protection FireSmart Manual) can modify fire behaviour to allow successful suppression. Consequently, 3m spacing has been widely accepted by many fire management agencies across Canada. However, in some ecosystems (lodgepole pine stands along the eastern slopes of the Rocky Mountains) 3m crown spacing has led to severe blowdown creating an entirely different fuel hazard and increasing treatment costs. This project will attempt to determine whether closer inter-crown spacing (1m) is sufficient to modify fire behaviour. The project site is located at the Canadian Boreal Community FireSmart Research Site near Fort Providence, NT which consists of Jack Pine and Black spruce.

This project is one part of the Forest Fuel Treatment Study which aims to gain an understanding of the effectiveness of specific forest fuel treatments. The Forest Fuel Treatment Study consists of several projects that will look at the effectiveness of stand-thinning, stand-cleaning, mulching, and under-burning.

Objectives

The primary objective of this field experiment is to test the effect that 1m inter-crown spacing has on the behaviour of an upwind crown fire as it burns up to and through the treated area.

Methods

Research Plots

Two research plots were established in 2011 at the Canadian Boreal Community FireSmart Research Site (CBCFRS) near Fort Providence, NT. The GD1 plot was thinned to 1m crown spacing by removing dead standing stems. Pre and post treatment vegetation data was collected according to the ASRD Vegetation Monitoring Manual. The GD2 plot was already naturally at 1m crown spacing and vegetation data was collected.

Burning

The burns will be conducted in accordance with the IAP. The burn schedule and timing to be established by the Incident Command Team and will be based on weather conditions and resource commitments to other concurrent projects at the research site. The ignition team will appointed by the Incident Commander. The NT fire crews will be responsible for hose and pump deployment and operation, monitoring plot boundaries for spot fires, fire extinguishment at the request of Incident Commander, and mop-up.

GD1 Plot:

- Will be burned before GD2.
- Will be burned with south wind preferably, but can also be burned with west or east wind.
- There are existing wicks along south edge and east edge of treated portion.
- Line ignition will be along south edge if south wind; west edge if west wind and east edge if east wind.
- Line ignition will utilize wicks preloaded with Flash21.

GD2 Plot:

- Will be burned with south wind preferably, but can also burn with west or east wind.
- Line ignition will be along the south edge if south wind; west edge if west wind; east edge if east wind.

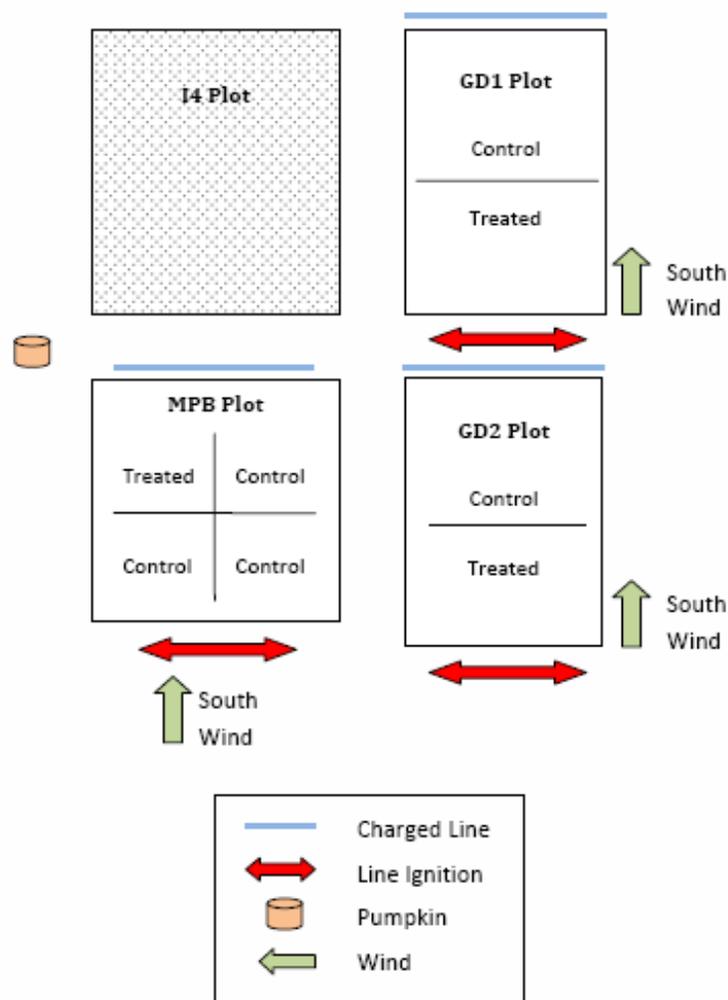


Figure 1. Burn plan for GD1 and GD2 research plots at the CBCFRS in NT.

Fire Behaviour Documentation

Researchers will deploy in-fire cameras, data loggers and flame length poles; the number and location of which will be determined on-site. Location of equipment is to be captured on a GPS unit for upload into the mapping database. Researchers will record fire behaviour from the onset of ignition to extinguishment using a pre-established fire behaviour data form.

Resources Required

- one crew
- pumpkin and hose
- terra torch or 2 drip torches
- 20 gallons of Flash21 for each wick line
- in-fire cameras and boxes
- data-loggers
- 2 hand-held video cameras
- 2 still cameras
- vegetation monitoring kit
- GPS unit

Safety

Safety procedures and protocol are to follow that which is laid out in the 2011 NWT Incident Action Plan.

The FPInnovations equipment trailer will be on site and is equipped with first aid supplies and eye wash station. A satellite phone and all appropriate contact information and emergency response procedures are also contained in the trailer. All FPInnovations personnel maintain First Aid certification and all FPInnovations personnel will wear personal protective equipment at all times while on site as per FPInnovations policy.

Timeline

Burns will be conducted sometimes during the last two weeks of June 2012, weather and resource dependent.

Deliverables

- Data for the Fire Behaviour Knowledge Base.
- Data for ASRD Vegetation Monitoring Database.
- Web report and edited video posted on the website.
- Present results at Partners in Protection annual general meeting.

Participating Members/Collaborators

Alberta Sustainable Resource Development

Northwest Territories Government

British Columbia Ministry of Forests, Lands and Natural Resource Operations