

# Can light thinning work as a forest fuel treatment in Black Spruce?

## A CASE STUDY

Colleen Mooney



---

Location: Kananaskis, AB

Date: October 1, 2012

# The Issue

---

- Thinning to 3m crown spacing is recommended by FireSmart and widely accepted
- FPInnovations has shown that this standard is effective, but...
- Heavy thinning has resulted in significant blowdown in some areas
  - » creates a whole new fire hazard
  - » increases treatment costs

# The Question

---

Can lighter stand thinning still be sufficient to mitigate aggressive crown fire behaviour?

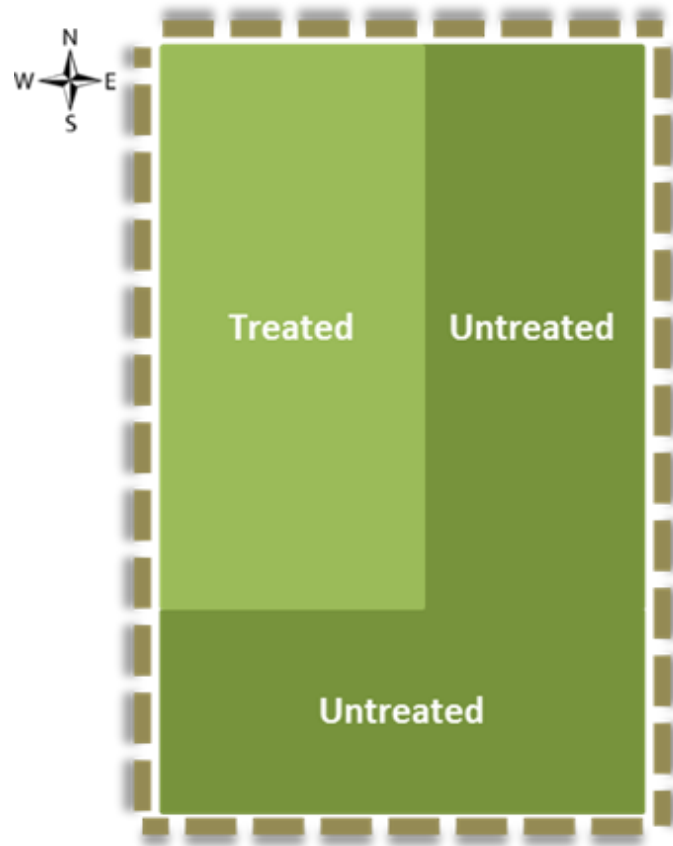
# The Approach

---

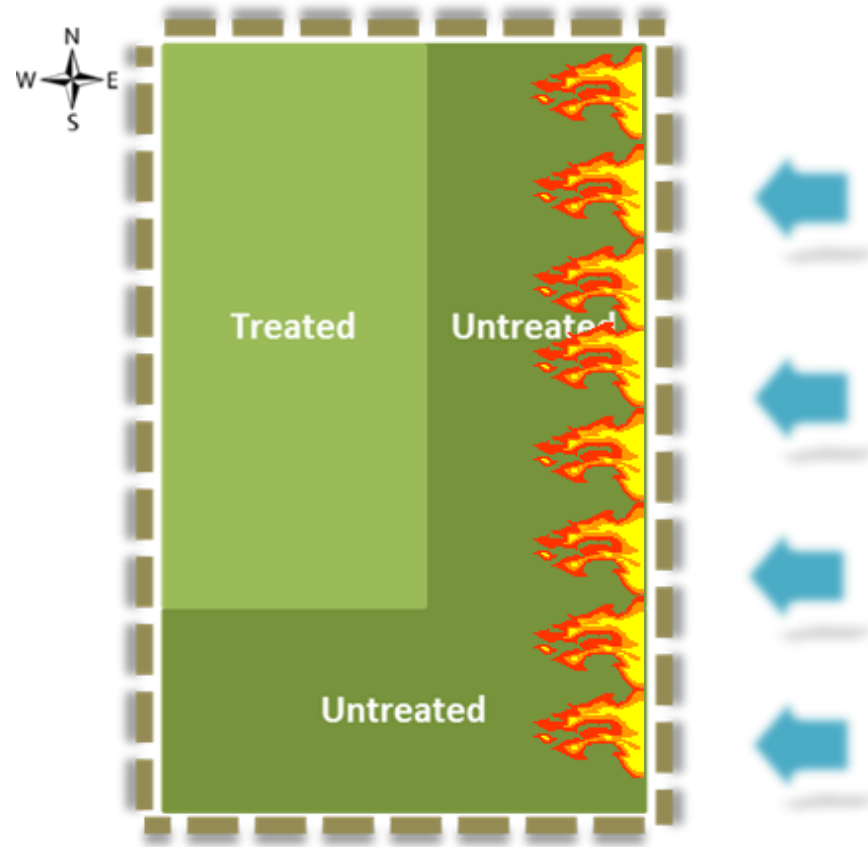
Conducted an experimental burn where we tried to run a crown fire into a lightly thinned Black Spruce stand.

Goal: To observe changes in fire behaviour as fire moved through our treated zone.

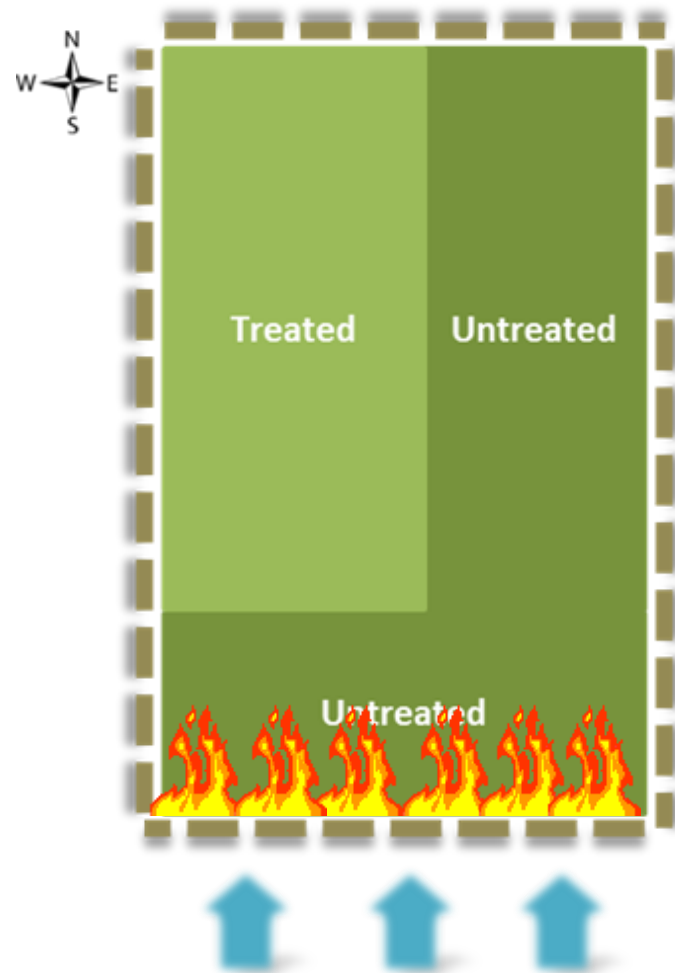
# The Plot



# The Plot



# The Plot



# The Plot



Before



After



# The Plot

	Pre-Treatment	Post-Treatment
Overstory Stand Density (stems/ha)	734	575
Understory Stand Density (stems/ha)	550	183
Crown Fuel Load (kg/m <sup>2</sup> )	0.94	0.81
Crown Bulk Density (kg/m <sup>3</sup> )	0.15	0.13
Surface Fuel Load (t/ha)	13.4	5.5

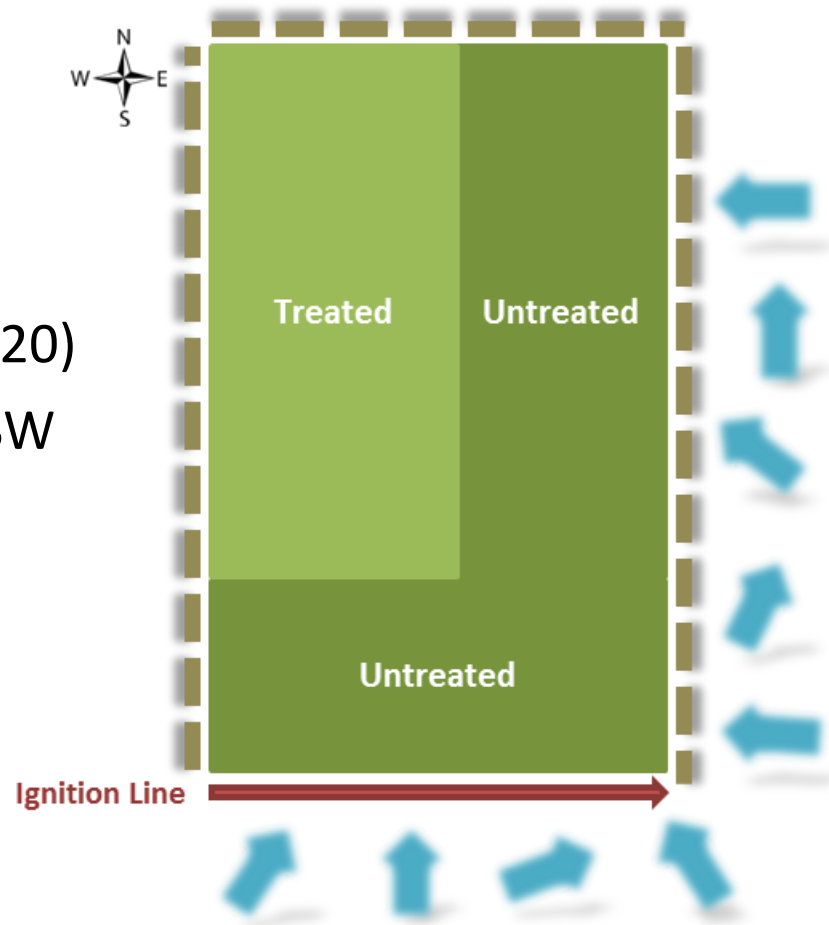
# The Burn

- 9 in-fire video cameras in treated zone
- 15 ROS data loggers in treated zone
- 1 observer in the helicopter
- no safe observation point on the ground
- majority of analysis from video footage

# The Burn

## WIND

- 6-10 kph (max 20)
- variable S/SE/SW



# The Burn

---

Intermittent crown fire shortly after ignition

# The Burn



# The Burn

Intermittent crown fire shortly after ignition

## Untreated Area:

- aggressive surface fire with 3m flames & frequent torching
- wind gusts triggered aggressive intermittent crown fire
- pockets of active crown fire (fuel + wind)

# The Burn



# The Burn

Intermittent crown fire shortly after ignition

## Untreated Area:

- aggressive surface fire with 3m flames & frequent torching
- wind gusts triggered aggressive intermittent crown fire
- pockets of active crown fire (fuel + wind)

## Treated/Untreated Boundary Area:

- moderate intensity surface fire between gusts
- fire crept up tree boles but did not reach branches
- wind gusts triggered vigorous surface fire with torching



# The Burn



# The Burn

Intermittent crown fire shortly after ignition

## Untreated Area:

- aggressive surface fire with 3m flames & frequent torching
- wind gusts triggered aggressive intermittent crown fire
- pockets of active crown fire (fuel + wind)

## Treated/Untreated Boundary Area:

- moderate intensity surface fire between gusts
- fire crept up tree boles but did not reach branches
- wind gusts triggered vigorous surface fire with torching

## Treated Area:

- low intensity surface fire between gusts
- moderate intensity surface fire during gusts with v. little torching

# Our Results

- At the threshold weather conditions for active crown fire at this site
- Inconsistent wind speed and direction
- Fluctuating fire behaviour and changing fire direction
- Did not achieve the desired fire movement
- No useful ROS data

# Our Results

We didn't get to see the effect our treated area might have had on an advancing crown fire.

Wind gusts did not trigger aggressive fire behaviour in our treated area

- light to moderate intensity surface fire
- little to no torching

# Summary

---

- Results are preliminary
- Analysis of video continues
- Full report available by year-end
- A second plot is ready to burn in 2013

# Any Questions?

---

Q & A

# Thank You!

## Contact

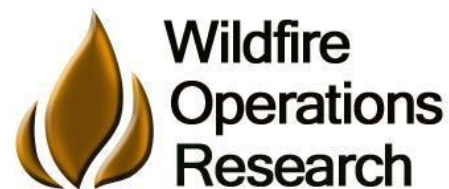
**FPInnovations**  
**Wildfire Operations Research**

**Colleen Mooney**  
**Researcher**

1176 Switzer Drive  
Hinton, AB  
T7V 1V3

Phone: 780.817.1849  
Email: [colleen.mooney@fpinnovations.ca](mailto:colleen.mooney@fpinnovations.ca)

<http://wildfire.fpinnovations.ca/>



© 2010 FPInnovations. All rights reserved. Copying and redistribution prohibited.

® FPInnovations, its marks and logos are registered trademarks of FPInnovations.