

FUEL TREATMENT EFFICACY RESEARCH

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BRITISH COLUMBIA | BC Wildfire Service

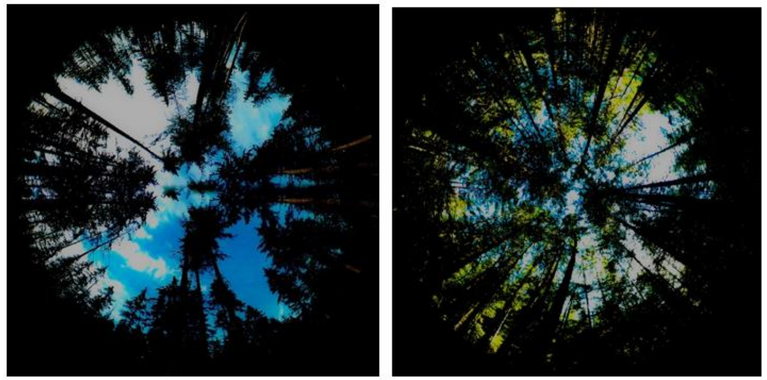
FPInnovations

PRESENTATION OBJECTIVES

- Explain fuel treatment efficacy research projects
- Share key findings

Fuel treatment efficacy research projects

- Case studies to document wildfire/fuel treatment encounters
- Evaluating the impact of reduction in canopy cover on in-stand microclimates
- Evaluating the flammability of chipped debris in fuel treatments



CASE STUDIES TO DOCUMENT WILDFIRE/ FUEL TREATMENT ENCOUNTERS

Case studies will address three overarching questions:

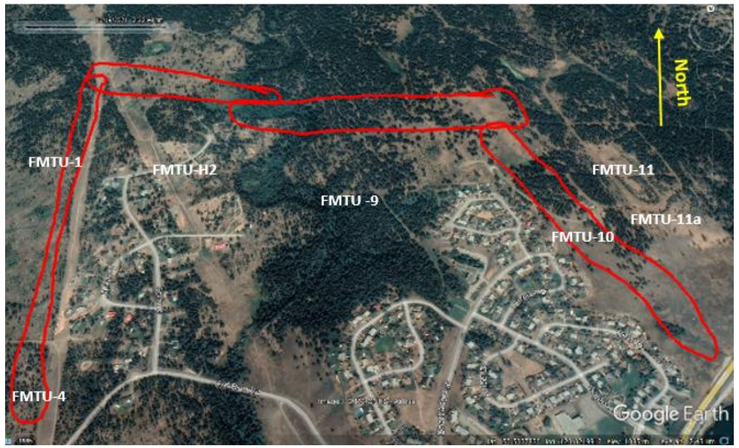
- Was there a change in fire behaviour resulting from the wildfire moving into the fuel treatment area?
- What factors contributed to a change in fire behaviour?
- Was there a change in suppression strategy and tactics based on the presence of the fuel treatment or a change in fire behaviour? Did the fuel treatment provide a strategic or tactical advantage in suppression operations?

Courtesy of BC Wildfire Service

TREMONT CREEK K21849/ LOGAN LAKE FUEL TREATMENT CASE STUDY KEY FINDINGS

Fuel treatments were a major asset in successful suppression operations

- Identifiable and receptive targets for retardant drops.
- More effective retardant coverage with reduced canopy interception
- More efficient control line construction and ignition operations in fuel reduced areas and natural clearings
- Easier and safer access/egress for suppression personnel/equipment



Photos courtesy of BC Wildfire Service

A wind shift (NW to SW) was a large contributor to suppression success

- Better visibility enhanced airtanker operations
- Flanking fire spread with the west winds impacted the fuel treatments on the north side of Logan Lake with reduced intensity

With sustained NW winds the fuel treatments would have been challenged to a greater extent

NOHOMIN CREEK K70580/LYTTON FIRST NATION COMMUNITY OF STRYEN FUEL TREATMENT CASE STUDY KEY FINDINGS

- Fire travelled seven km in the first burning period (July 14)
- Response personnel were focussed on public safety and evacuation
- Extreme fire weather conditions persisted through the evening (wind speed 15 to 20 km/h)
- Fire entered fuel treatment south of community in early evening
- Observations of subdued fire behaviour in treated C-7 fuels (Rank 3 or less)
- No damage to community hall in Stryen community

EVALUATING THE IMPACT OF REDUCTION IN CANOPY COVER ON IN-STAND MICROCLIMATES

Stand thinning is a common practice in forest fuel reduction treatments to reduce the potential for crown to crown fire spread

Opening a forest canopy and removing midstory and understory stems allows more solar radiation and wind flow at the surface levels.

Fuel practitioners have questions regarding the resultant impact on the surface level microclimate and fuel moisture.

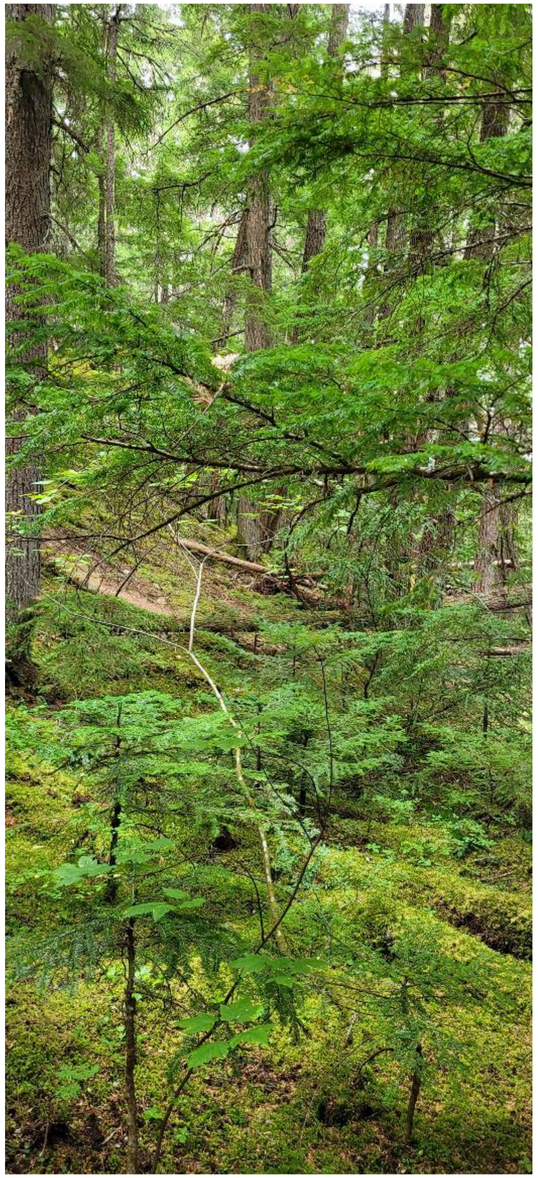
IN-STAND MICROCLIMATE STUDY

Previous studies document impacts of reducing canopy cover in dry conifer sites:

- Increased solar radiation
- Increased temperature
- Reduced relative humidity
- Increased wind flow
- Reduced fuel moisture content

This research project explores these impacts in wetter ecosites in three study sites:

- Whistler
- Revelstoke
- Sicamous



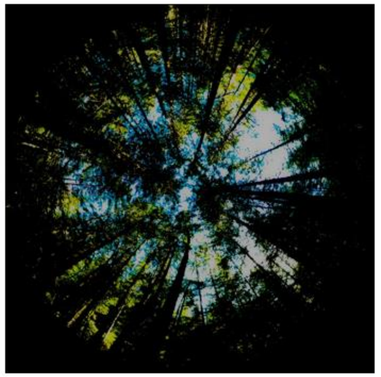
IN-STAND MICROCLIMATE STUDY SITES

Paired plot study with plots in
- Fuel treatment area and
- Adjacent natural forest stand (control)

- Stand characterization
  - Canopy closure, stand density, height, LCBH, species
- Surface fuel loading

- Weather station deployment

Fuel moisture sampling
- Size class 1 and 2 (less than 1 cm)
- FTS stations record 10-hour fuel moisture content



IN-STAND MICROCLIMATE STUDY SITES

Study site attributes

Study site	BEC	Treatment type	Canopy closure – Delta (TU - control)
Sicamous	ICHdw4	Harvest retention	17.4%
Whistler	CWHms01	Harvest retention	7.1%
Revelstoke	ICHmw3	Motor-manual thinning	6.1%

EVALUATING THE FLAMMABILITY OF CHIPPED DEBRIS IN FUEL TREATMENTS

Harvey Lake Wildfire Risk Reduction Research Area
Okanagan Shuswap Natural Resource District

A WRR fuel treatment area is being developed to reduce wildfire risk to community, infrastructure, and critical watershed

- 10 km south of Lumby
- 36 hectare fuel treatment area
- Dry conifer fuel environment
- North aspect on slopes up to 40%

FLAMMABILITY OF CHIPPED DEBRIS

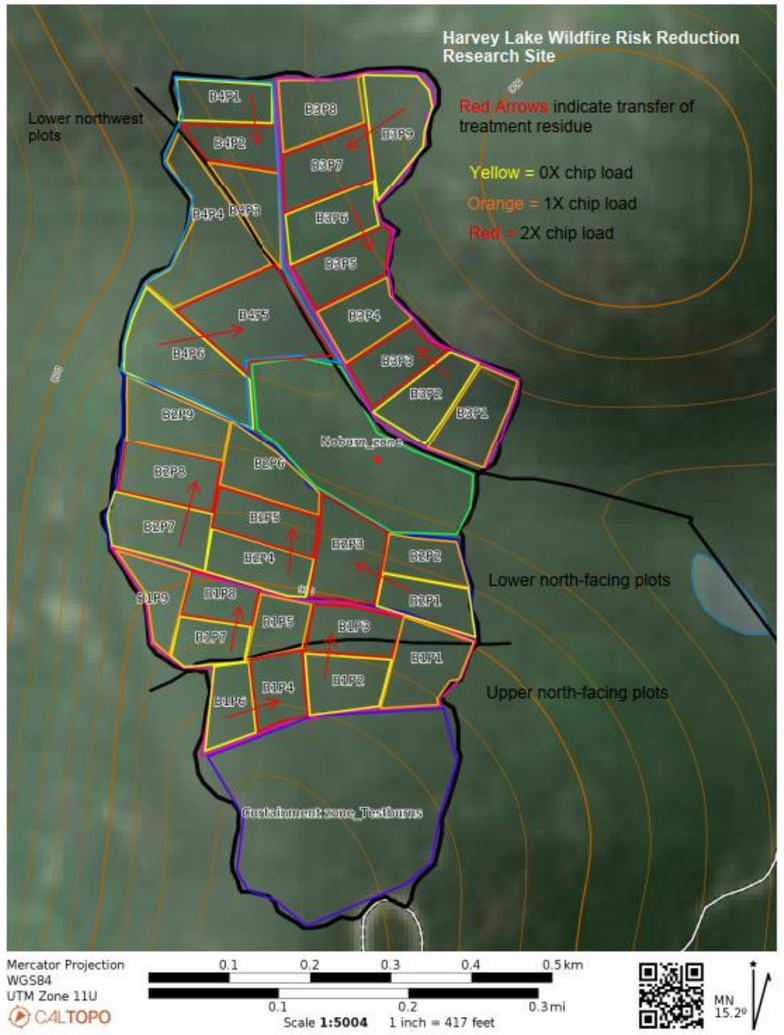
Harvey Lake Wildfire Risk Reduction Research Area

Fuel treatment will be conducted according to FMP

Debris management standards will be modified to create plots with three chipped fuel loads:

- No chips (representative of a pile and burn)
- 1 X chip load (representative of a chipping operation)
- 2 X chip load (represents a stand thinning with greater volumes of residue)

Experimental burns will be conducted to document fire behaviour in these varied fuel environments



FLAMMABILITY OF CHIPPED DEBRIS

Hügelkultur as a debris management technique in forest fuel reduction treatments

Ophir Lake fuel treatment area near Rossland

- Hugels are mounds of smaller stems in the core with chipped debris as a covering
- Treatment residue concentrated in open areas rather than being broadcast

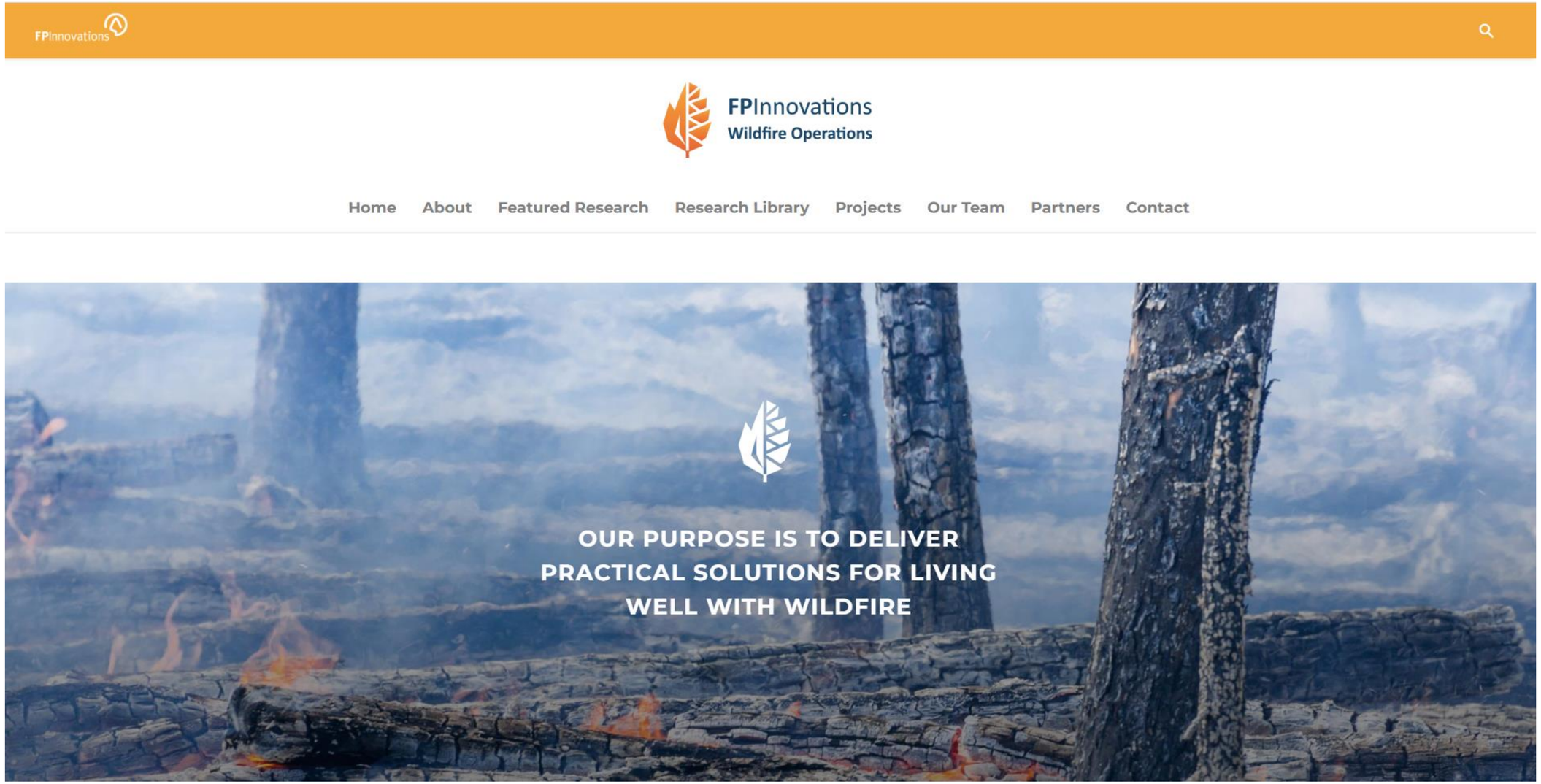
Test burns (October 2022)

- Chip fuel moisture content (7.7 to 14.2%)
- Difficult ignition with BBQ briquettes
- Leaf blower required to achieve sustained burning
- Minimal fire spread with low flame length

Courtesy of A. Bennett – Livinglands Agroecology

Open access to research documents

HTTPS://WILDFIRE.FPINNOVATIONS.CA



GET IN TOUCH

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