



## **Wildfire Operations Research Fall Advisory Committee Business Meeting Minutes**

**Networking Session and Business Meeting  
November 28, 2018**

### **Location**

Sawridge Inn and Conference Center, 4235 Gateway Blvd, Edmonton, Alberta

### **Attendees**

**FPInnovations:** Chad Gardeski, Denis Cormier, Rex Hsieh, Steve Hvenegaard, Razim Refai and Greg Baxter (on-line)

#### **Collaborative funding partners**

**Government of Alberta:** Quentin Spila, Dave Schroeder, Cordy Tymstra, Wendell Pozniak, Partick Loewen, Jill Moorley and Kyle Fitzpatrick

**Government of the Northwest Territories:** Westly Steed

**Government of Saskatchewan:** Chris Dallyn

**Conair Aerial Firefighting:** Revie Lieskovsky

## Review of the 2018 program and project list

Collaborative projects on track for completion by March 30, 2019

- Hummingbird crowdsourcing detection system
- Retardant on mulch
  - Comment from Dave Schroeder - In the retardant on mulch trials, the plots were too small and would like to have further trials with larger plots
  - Response from Chad Gardeski - Further trials will be initiated as an additional phase of the project
- Larix flammability
- Mulch intensity productivity and fire behaviour
- Lapse rate – real time data transfer conceptual testing
- Thermal canister
- Crib testing - will get underway in January with 50 to 60% of the burns targeted for completion by March 31.
- Infrared RPAS (UAV) platform review for hotspot detection

## Grant projects for 2019

- Alberta Agriculture and Forestry Decision Support System project
- FRIAA – sprinklers phase II (not yet secured)

## Deliverables for March 30, 2019

- Chemical usage survey
- Design and evaluation of an in-line mixing system for Helitorches technical report
- Helitorch Redesign – Progress Update II Info Note
- Thermal Canister report
- Mulch Intensity productivity and fire behaviour
- Case Study - Hummingbird thinning
- Retardant on Mulch
- Larix Flammability Technical report
- Hummingbird detection
- Infrared RPAS (UAV) platform review for hotspot detection

## Collaborative projects on our work plan for 2019

### Wildfire chemical testing and roadmap

- C. Dave Schroeder: We need to explore better engagement with CIFFC working groups to enhance information sharing. CIFFC should be consulted as the roadmap evolves. Question - How much cooperation will there be from the USFS?
- Q. Is it worth consulting other agencies to see what other peer review would be needed?
- A. The USFS has been involved in the wildfire chemical roadmap. We have visited Missoula in 2017 to see if the Thermal Canister work was the right direction to proceed. They were interested to see how the tests panned out. Cecilia Johnson was helpful in disseminating some

of the results from the Thermal Canister – specifically in understanding that each chemical has its own rheology and simple comparisons do not capture the whole picture. In addition, the results from the Thermal Canister have been discussed with the team at Missoula, and have even been peer reviewed by Greg McBride. We have received good engagement with the USFS.

**Action item:** When crib testing is complete, FPInnovations will engage with USFS to review results.

- C. Quentin Spila: Different equipment is required to prepare/mix gel products with water by different mechanisms (e.g. shearing); If some aircraft are set up with certain piece of equipment it may limit the usefulness of aircraft in other agencies.
- A. Chris Dallyn: Saskatchewan uses FireIce but aircraft can still use foam and water.

**Action Item:** FPI need to clarify that the cost-effectiveness index does not include logistics costs, and only includes cost of chemicals. This point will be made prominent during future discussions and in the report.

- C. Quentin Spila: We still need to be convinced that these gels are effective. Can gels knock down a HFI 5 fire? If they are reducing the intensity, then we can use it.
- A. Razim Refai: Our lab tests are showing the reduction in intensity when using gels but we have explored this only at a lab scale.

**Action Item:** FPInnovations will review the feasibility of creating high HFI test conditions in a laboratory environment. Can effectiveness of chemicals be modelled? We need to explore principles and limitations of modelling wildfire chemicals.

### **Underburning**

- Will continue with trials at CBCFS and Enterprise using larger plots (up to 100 m X 100m)
- Discussion on the most appropriate data to collect on the underburning trials?
- Another area of interest in developing a fuel treatment not as a stand-alone but as part of a stand management strategy. Need to determine when treatments become flammable after treatment and when we need to underburn as treatment maintenance.
- An original question with fuel treatments was ‘how effective is a treatment in mitigating crown fire. Underburning plots can be established in order to treat the plots with underburning and then late challenge the plots with crown fire.
- It would be worthwhile to do ignition tests in treated areas to measure spot fire growth rate.
- Underburning sites may be available in other fuel environments; Ponderosa Pine in southern interior; black spruce in NWT? There may be opportunity to collaborate with BCWS and other agencies to participate in prescribed burns in other forest stand types.

**Action item:** FPInnovation should develop consistent data collection methodology. Initial discussions on data collection attributes include suggestions for – stand type, density, FBP fuel type, surface fuels (pre- and post-treatment, fire behaviour, ignition mechanisms and pattern, resources, difficulty of control etc.

Action Item - Greg will follow-up with Alberta and BC to see if underburn projects are planned for spring 2019 and determine how to integrate these burns into the project.

### **Wildfire hazard in regenerating forest stands following wildfire – CBCFS**

- An opportunity related to underburning addresses the temporal changes in ignition potential, resistance to spread and potential fire intensity in forest stands during various stages of forest succession following a wildfire event.

Possible research questions include:

- What impact will fire severity have on fuel consumption and potential fire behaviour?
- At what stage of succession does fuel accumulation (dead standing and surface fuel) reach a hazardous level?
- At what stage can underburning be conducted to reduce this hazard?

### **Pelican Mountain projects**

- Cluster retention (unit 4)
- Unit 1 is still the highest priority. Prepped in 2018 to burn but were stalled by rain. Target for spring 2019
- Retardant on mulch – Phase 2 trials with larger plots (refinement of the methodology). Possibly evaluate using an actual tanker drop (e.g. 802).
- Underburning
  - There may be opportunities in mixed wood stands at Pelican Mountain
- Mulch intensity productivity and fire behaviour – Unit 10 is dedicated to refine treatment intensities (number of passes, composition, etc.)
- Black spruce fuel amendment; Unit 3 slated for prep work with dozer in early 2019

### **IR handheld cameras**

- Project has been deferred to 2019

### **Real time lapse rate data transfer**

- Phase II on track to commence in 2019 - Operational trials to be initiated with Conair and Latitude.

### **Windrow burning**

- Greg will continue collaboration with High Level Area and conduct trials as opportunities present themselves. Other conifer debris sites are being evaluated in Grande Prairie, Rocky Mountain House, and the Southern Rockies.

## Project Proposals

[Weblink to presentation for project proposals](#)

### **Rapid Response data collection**

Project Context: Wildfire management agencies would like to have more data to evaluate the effectiveness of fuel management treatments. The National Fuels Management Reference database was created in 2016 and is hosted by CIFFC and managed by the CFS IM/IT. This database is available to all member agencies to contribute fuel treatment records and fire behaviour records. A systematic data collection methodology that can be used by broader range of personnel is needed to input consistent data to the database. A large fuel management and fire behaviour dataset with case studies will help to inform decision support tools.

C. Dave Schroeder: Most interested in fires that are burning into fuel treatments; previous comment from Jen Beverly that when a fire is burning into a mixedwood stand this is similar to a fuel treatment encounter.

C. Chris Dallyn: Looking back on case studies; data is not easily accessed and may not be appropriate,

C. Quentin Spila: AB has a mobile device initiative; do we need another initiative developed by another group.

C. Chad Gardeski: Developing tools to collect data is only one part of the equation; need to define the methodology to collect the data and determine who collects it.

C. Dave Schroeder: May be worthwhile to canvas agencies on how they collect data.

C. Chad Gardeski: We need two things; easy data collection and process for instrumenting an area which is going to be impinged.

C. Mike McCulley: BC needs extra data collected but there is no appetite to put an extra load on AAOs. When we think rapid response, think about more than fire behaviour and fuel treatments. Need multi-talented teams that can conduct several different research projects.

C. Denis Cormier: Any time you have an opportunistic approach to data collection, you will have soft science. If everyone is sharing the same data collection process, there can be good sharing of knowledge.

C. Chad Gardeski: Rapid response is already tied into the DSS grant. There seems to be general support for a rapid response team and kit.

### **Spotting/structure protection research**

Project context: Wildfire management agencies would like to better understand ember transport mechanisms, fuel receptivity to embers and the risk of ember propagation in order to deploy effective structure protection strategies. Field observations under various conditions will help inform ember transport and propagation modelling.

Question, Denis Cormier: Is there a niche for us in the spotting/structure protection research?

A. Dave Schroeder: Alberta WMB isn't that interested in structure protection and spotting. These things aren't high priorities but may be opportunities for growth. Other agencies have dedicated a lot of time and energy.

C. Westly Steed: There have been some growing pains in determining responsibilities for structure protection.

C. Quentin Spila: Is the Office of the Fire Commissioner a funding partner? Research is good but maybe other agencies should be supporting this project.

C. Chad Gardeski: Spotting/Structure protection research seems to be is a lower priority proposal.

### **Equipment evaluation research**

Project context: An unbiased third-party team can evaluate equipment for agencies and provide data to inform purchasing, operational, and contract decisions. This can reduce pressure on agencies during busy times of year. This system can also develop Canadian standards for wildfire equipment and service providers.

C. Mike McCulley: Vendors don't like it. See it as another step of bureaucracy they don't like. Supports the idea of 3<sup>rd</sup> party independent evaluation. Could take the pressure of agencies, lead to standardized test methodologies and eventually to the development of standards.

C. Chad Gardeski: Seems like support in principle. Will look to develop standardized methodologies, similar to the pump testing recently completed in Hinton. Important to clearly understand the criteria most relevant to the agencies (e.g., performance measures – look to the UAV grid as an example of success)

### **Firefighter tracking research**

Project context: Wildfire management agencies are required to ensure the safety of wildfire fighting resources and the cost effectiveness of wildfire operations. This project would explore technologies that can be woven into the fabric of firefighter clothing to collect and relay biometric data with GPS information. Another objective would be to investigate the ability to determine and monitor productivity of firefighters and crews using biometric data and track logs.

C. Westly Steed: Northern areas don't have cell network for tracking FFs. SPOT devices are being used. Productivity could be assessed. Monitoring people and the amount of work they are getting done may be a benefit.

C. Mike McCulley: Health: It is challenging to determine a baseline of health because FFs start at such a high level and increase over the first part of the season.

C. Mike McCulley: Crews want to be tested: WorkSafe does not have a standard

C. Westly Steed: What are the problems; is this a methodology that could be used? Presumptive cancer is an issue that is arising in both structural and wildland firefighting agencies.

C. Quentin Spila: Cumulative fatigue may be another issue that this methodology could address. Tracking isn't an issue in Canada because we don't put people in these situations.

C. Dave Schroeder: Dan T. has a research question that addresses the effect of fuel treatment on firefighter productivity.

Action Item - Rapid response and equipment evaluation are the two proposals received the highest interest from the audience poll. Look to develop these into the 2019 program.

## Project Proposals from spring 2018 advisory meeting

### Wildland firefighter smoke exposure

Action item – initiate a scoping exercise with literature review to investigate recent developments in monitoring of firefighters exposure to smoke and cumulative effects on firefighter health. Will consult with BCWS on firefighter smoke exposure monitoring initiatives.

Work with Chris Dallyn to scope the project

### Comparing the flammability of larix and black spruce

Suggest a second phase using a more diverse set of sampling locations to confirm that the flammability differences hold true across various location, including low, mid, and upland sites. Good candidate for a graduate student. FPI will explore this opportunity.

C. Dave Schroeder: Awesome results; hoping that Dan and Ginny (CFS) can use data in Firetec. Need to determine a mix. MM folks are wiping out Black Spruce and planting larch. We don't have anyone on the research side to take on Larix projects at Pelican Mountain

May not need someone to do data collection but provide tech transfer. Would like to be able to review from a silviculture perspective with FPI.

C. Chad Gardeski: FPI can likely provide support on silviculture trial methodology.

Action item – Dave to forward larix planting plan to Denis for peer review. Denis to forward to other experts.

## General Administration; finances and HR

### Funding support from the Forest Industry

- FPIInnovations Forest Operations partner funding contributes significantly to the Wildfire Operations program annually.
- It will be important to show value for the contributions.
- Looking to develop a framework for stronger Forest Operations representation on the Advisory committee as a voting member.

### Canadian Partnership for Wildland Fire Science

- FPI should be part of Canadian Partnership; important to talk to Mike about tech transfer; many different portals for different agencies
- Benefit in having more frequent business meetings

Action Item: Chad will work with the Forest Operations advisory committee to determine how they would like to be represented.

Action Item: FPInnovations is discussing a reciprocal funding agreement with Wildfire Canada that will enable each other to be involved with establishing program priorities. This type of relationship will increase the synergies between the two organizations, should create additional leveraging opportunities and efficiencies in coordinating knowledge exchange and transfer events. FPInnovations will look at becoming a managing partner in the partnership and will determine what is required for the Partnership to be considered a voting partner for the Wildfire Operations program.

Action Item – The funding partners will meet more frequently to provide progress updates. We will schedule quarterly business meetings throughout the year, two face to face meetings as we have done in the past and two via webinar or conference call

### **Spring 2019 advisory meeting**

Target April 3 and 4, 2019. A tentative format will be solidified during the next interim remote meeting.

- April 2 – Evening social with presentations by vendors or agency representatives
- April 3 - Public meeting with presentations on completed projects and updates on ongoing projects.
- April 4 – Business meeting to review project proposals and prioritize new research projects.