



**Wildfire Operations Research**

**ADVISORY COMMITTEE MEETING MINUTES**

**March 06, 2012**

**LOCATION**

Alberta Innovates - Technology Futures  
Edmonton, Alberta

**ATTENDEES**

**FPINNOVATIONS:**

Mark Ryans	Steve Hvenegaard	Roy Campbell
Ray Ault	Colleen Mooney	Gary Dakin
Greg Baxter	Rex Hsieh	Jim Thomasson

**GOVERNMENT:**

Quentin Spila; Brett Moore, Kevin Quintilio; Cordy Tymstra; Rory Thompson	ASRD
Larry Nixon	GNWT
Chris Dallyn	SASK Ministry of Environment
Jay Woosaree	Alberta Innovates - Technology Futures
Jeremy Wagner	Alberta Fire Commissioner's Office
Marc Mousseau	CIFFC

**INDUSTRY:**

Mark Insley	Latitude Technologies
Gerry Geisler; Dennis Hulbert	Eco Fire Solutions
Revie Lieskovsky	Conair Aviation
Chris Lindsay	FTS
Gordon	ICL
Terry Popowich	Discovery Air
Rick Solomon	FireFox Thermo-Tech
Rob Hyslop; Darcy Millar	RGH Pacific

**ON-LINE PARTICIPANTS:**

Jeff Berry	BCFLNRO
Tom Schiks	University of Toronto
Jim McLellan	Absolute Fire Solutions
Tim Curtis	....
David Thomas	....

## INTRODUCTIONS AND HOUSEKEEPING

### **Mark Ryans**

#### FPINNOVATIONS NEWS

Mark welcomed everyone for attending and on the phone. FPInnovations is a global research and development institute. It provides research solutions for the full value chain. It is the largest private not-for-profit forest research institute in the world. FPInnovations recently developed a new business model with 11 research programs – one of which is Wildfire Operations Research. The changes should not affect the day-to-day operations of the Wildfire program and it will continue to have its own advisory committee, ACFIRE.

### **Ray Ault**

#### PERSONNEL CHANGES

- Jon Large left FPInnovations in December. He is now in Calgary with National Parks.
- Wally McCulloch recently passed away. He had worked with our fire group in the early years and was a good friend to many in the fire community.

#### RECENT REPORT WEBSITE POSTINGS

- Evaluation of Remote-Start Pump Systems for Use in Wildfire/Structure Protection
- Ignition Potential of Portable Propane Campfires
- Existence of Humidity Domes Created by Wildfire Sprinklers
- Comparative Analysis of Hotspot Detection Methods: Ground-based Infrared Camera Assisted vs. Conventional Practices
- Heavy Equipment Workshop
- Evaluating the Effectiveness of FireSmart Priority Zones for Structure Protection
- Exploratory Research into the Development of a Three-dimensional Grid for the Evaluation of Long-Term Retardant Drops
- Visual Assessment Method of Measuring Airtanker Drops

#### REVIEW OF BREAKOUT SESSION FROM FALL 2011 ADVISORY MEETING

Two breakout sessions were held following the fall 2011 meeting: Fuel Management for Community Protection and Aviation.

#### **FUEL MANAGEMENT**

Four primary questions came from this session:

1. What questions are FPInnovations trying to answer with forest fuel treatment projects?  
*Answer:* Validate or disprove FireSmart recommended guidelines.
2. There is a need for agencies to identify short- and long-term fuel management strategies and to pass these along to FPInnovations as research priorities. The current process of proposing one-off projects is less than optimal.  
*Answer:* A number of initiatives are underway including the National Vegetation Management Survey, Slave Lake Wildfire Review and others. It has been suggested that a workshop be held to identify knowledge gaps that would result in a more integrated forest fuels strategy.

3. Is there a need for a current fuels situation map of the WUI to assist in developing strategies during wildfires?

*Answer:* This approach looks to be agency specific and probably isn't an FPInnovations project.

4. Wildfire Operations Research needs to do a better job of communicating results.

*Answer:* We are open to suggestions on specific ideas to improve communication and implementation of research results. Communication is an ongoing effort. The recent redeveloped website and directed email notification of research results are examples of the ongoing evolution of the program and information sharing with the fire community.

#### **AVIATION**

The aviation breakout session discussed drop testing needs and water-enhancing gel evaluations. FPInnovations had asked for guidance in investing in technology to improve drop testing.

1. How many more drop tests are anticipated?

*Answer:* We do not know. Aviation companies contact FPInnovations a few months before drops are required, thereby making it impossible to predict the future number. They are expensive to do and require a large commitment of resources. We estimate \$65,000 to purchase tools that would allow us to streamline the data collection process. The estimate includes a differential GPS unit (10k) and radio frequency ID tags (45k) and improved cup holders.

2. Who would pay for this? [Revie Lieskovsky]

*Answer:* We envision wide spread funding as we see the fire community in general benefits from these drop tests.

3. Was the idea of sharing equipment between the US and Canada brought up with the USFS National Fire Committee?

*Answer:* No. FPInnovations rents some equipment now and development of specific tools would need to be something we do for Canadian agencies.

4. *Comment:* [Dennis Hulbert] A new generation of US Forest Service airtankers will be contracted in the near future. There may be an opportunity to work more closely with the USFS in the future.

5. *Comment:* [Jeff Berry] Five new tankers in USFS – may want to come to Canada in the future (would need testing). These aircraft would use higher viscosity chemicals that require testing in our fuel types.

Developing methods to measure the cost effectiveness of water-enhancing gels is important and this was also talked about in the breakout session. Our approach to gel testing is included in the 2012/13 annual work plan.

#### **APPROVAL OF FALL 2011 MINUTES**

Approved by Kevin Quintilio, seconded by Larry Nixon

## CURRENT PROJECTS

### ***Greg Baxter***

#### **PROJECT: SURVIVAL ZONES FOR WILDLAND FIREFIGHTERS**

ISSUE	When entrapped, what size of opening is required to increase probability of survival in a boreal environment?
APPROACH	To instrument openings in timber and run an intense wildfire over the area to document fire intensity to assess survivability.
PLAN	Burn 2 forest plots and 4 grass plots this year.
TIMELINE	We will present wildfire survival zone guidelines in Fall 2014.

#### **PROJECT: HARVEST DEBRIS MANAGEMENT**

ISSUE	Depending on your viewpoint determining appropriate debris loading is difficult.
APPROACH	To establish a range of acceptable debris loads based on initial attack crew suppression capabilities.
PLAN	We will use three levels of harvest debris loads as a benchmark to document difficulty of control.
TIMELINE	Findings will be reported in Fall 2013.

### ***Roy Campbell***

#### **PROJECT: IGNITION DEVICE EVALULATION**

ISSUE	There is a lack of an ignition device evaluation process and the need to evaluate ignition devices and their use.
APPROACH	Work with industry and specialists to evaluate technologies.
PLAN	Develop an evaluation process and test the process by evaluating several ignition products.
TIMELINE	Develop evaluation process and apply to three products in 2012, including the newly developed terra torch. Complete a final report with list of tools as opportunities allow. Include product summaries for the Alberta Ignition Manual.

#### **PROJECT: WILDFIRE SPRINKLER DESIGN**

ISSUE	Field practitioners have expressed a need for a more versatile sprinkler to provide greater vertical water delivery (into the forest canopy).
APPROACH	We will collaborate with U of Alberta Mechanical Engineering Department to sponsor the sprinkler design as a senior student project.
PLAN	Field test the designed sprinkler during the 2012 fire season.
TIMELINE	We will report in Spring 2013 the details of sprinkler prototype and evaluation results.

## **Ray Ault**

### **PROJECT: USE OF LOW-INTENSITY FIRE TO REGENERATE MPB STANDS**

ISSUE	Concern about regeneration of MPB-killed forests, particularly in areas where there is no salvage logging or scarification.
APPROACH	Graduate students from the UofA will compare under-burning to mechanical site preparation at Horse Creek research site near Whitecourt, AB.
PLAN	FPIinnovations will document fire behaviour during under-burning activities in support of U of A.

### **PROJECT: ACCURACY EVALUATION OF HELICOPTER BUCKET TRACKING SYSTEMS**

ISSUE	Currently there is no process in place to evaluate the accuracy and consistency of reporting from automated helicopter bucket data tracking technology.
APPROACH	We will conduct ground trials plus air trials and use scenario based trials to bring together fire management needs and system capabilities.
PLAN	Ground and air trials to be completed in 2012 along with the scenario based trials.
TIMELINE	Report on findings at the spring 2013 meeting followed by a workshop to explore the development of a format standard.
COMMENTS	SEI offered their hangar for ground trial data collection. Latitude Technologies also offered suggestions. Would the project involve all the tracking systems available? <i>Answer:</i> No, we would focus on the FASTTrac by Absolute Fire and Mission Tracker™ by SEI Industries Ltd / Latitude Technologies. Drop on ground and compare results to program software. [Dave (Absolute Fire)] How will the data be used? <i>Answer:</i> We will need the help of agencies and manufacturers to address what operational needs are a priority for data collection. [J Berry (BCFS)] It is important to calculate cost/drop (\$/L) to pinpoint the more efficient operators.

### **PROJECT: DEVELOP A STANDARD PRODUCT EVALUATION FOR WATER-ENHANCING GEL PRODUCTS**

ISSUE	Current process is to refer companies to the Qualified Product List (QPL). The Canadian process relies heavily on the USFS evaluation process, which evaluates products for chemical make-up and environmental impacts. There isn't a performance based test and one is needed.
APPROACH	This project will explore several field evaluation methods to direct the development of a laboratory test for wetting agents, water-enhancers and foams on wildfires.
PLAN	We will use both a field and laboratory approach. The field test will involve the use of fire, structures, evaporation tests and observations. Lab work will investigate use a Forced Ignition and Flame Spread (FIST) ignition apparatus to measure the time to ignition of foliar samples in the laboratory.
TIMELINE	We will present findings at the Spring 2013 meeting.
COMMENTS	When dropping, less gel is lost compared to foam. Droplet size of gel is larger and this limits drift. More hits the ground as less lost to drift, so it is more cost effective.

Should do field evaluations against water on a hot, very dry day.

Need people on ground (i.e. IA crews) to help as it is tough to get on the fireline during the drop.

Need to find a metric to compare costs and effectiveness.

#### **PROJECT: DESIGN AND CONSTRUCTION OF A TERRA-TORCH**

ISSUE	There is no ground-based ignition device specifically designed for Flash 21 petroleum gelling product and the product is now being used by most agencies.
APPROACH	We have contracted to have a prototype torch system built. The prototype will be field tested and the results will be posted on the website.
PLAN	Work with ignition specialists and industry to test the completed torch.
TIMELINE	The prototype will be ready for field evaluations in 2012. Report will be available in Spring 2013.
COMMENT	We do not plan to supply a torch product to the market. Our intention is to post drawings on our website to foster innovation in private industry rather than sell a product.

#### ***Jim Thomasson***

#### **PROJECT: ATHABASCA FIRE LOOKOUT TOWER CAMERA UPGRADES**

ISSUE	The Athabasca wildfire lookout tower has been replaced and the old cameras that allowed Edson to monitor the view-shed when the lookout observer was absent were removed.
APPROACH	Cameras will be upgraded and we will add capability for a new camera location to monitor a blind area along the Brule railroad tracks.
PLAN	Install new cameras at Athabasca and the blind area monitoring site. Once operational, we will hand over responsibility for maintaining the equipment to the ASRD radio shop.
TIMELINE	Complete camera installation for the Spring of 2012.

#### **PROJECT: PORTABLE FIRE DETECTION TOWER #2**

ISSUE	FPInnovations has developed expertise in fire detection camera systems and will transfer this research knowledge to the ASRD radio shop for wider application and use.
APPROACH	Integrate and build Portable Camera Tower #2.
PLAN	Tower will be handed over to SRD Radio shop upon completion and testing this summer.

#### **PROJECT: NEEDS ANALYSIS FOR A NEXT GENERATION FIRE FINDER**

ISSUE	The Osborne fire finder has been used in fire lookouts since the early 1900's. Alberta uses a 1934 model. Replacement provides an opportunity to step back and investigate the use of more modern technologies to improve wildfire detection and response.
APPROACH	Explore technologies that could enhance the effectiveness or efficiency of wildfire detection at the lookout or wildfire response.
PLAN	Interview users and develop a list of user needs. We will also analyze the historical record for efficiencies where technology would have benefited fire operations.

**TIMELINE** By Spring 2012, the scope will be defined, questionnaires sent out and interviews conducted. We will consolidate requirements and report back to the advisory in Fall 2012.

### ***Colleen Mooney***

#### **PROJECT: FIELD EVALUATION OF THE AERIAL APPLICATION OF WATER-ENHANCING GEL**

**ISSUE** Canadian fire agencies want field data to prove gel's ability to suppress wildfire. Without this data, widespread acceptance of gel is limited.

**APPROACH** Collect field data on water-enhancing gel's ability to reduce fire behaviour under wildland fire conditions. We will use rotary wing with a bucket to drop gel on fire and record observations.

**PLAN** We will collaborate with CIFFC and provincial agencies to evaluate water-enhancing gel performance on the fireline or during experimental fires.

**TIMELINE** Initial results will be presented at the Fall 2012 meeting; complete report in early 2013.

**COMMENTS** Why not attempt in slash first. You can have higher intensities and be close enough to observe results. See if it can be done in conjunction with the debris project in the Southern Rockies.

Is this a direct attack tool? If yes, then you should use water drops as a baseline.

[Jeff Berry] Output needs to be a cost/m of line. This can then be compared to other products to measure cost effectiveness.

Will use a dip tank to control loads and measure gel consistency.

Who wants to provide a land base for testing? [Rick Solomon]Saskatchewan has been doing drops with 580's - maybe they will be interested.

### ***Steve Hvenegaard***

#### **PROJECT: NATIONAL WILDLAND FUELS MANAGEMENT SURVEY**

Strategic goal is to have a more coordinated approach to wildland fuels management across Canada. This project is commissioned by the Canadian Council of Forest Ministers (CCFM) and a fuels management task team was created to:

1. Complete a survey of wildland forest fuel conditions and management programs across its member agencies.
2. Develop a strategy to gather, share and communicate best fuels management practices and policies.
3. Pursue innovative approaches to mitigating the costs of fuels treatments.

Survey issues:

1. Extent, cause and trends in hazardous wildland fuels.
2. Identifying, mapping and reporting hazardous fuels.
3. Effect of forest management planning policies.
4. Extent and effectiveness of fuels management programs.

Recommendations for program improvements will be presented. We will follow up on the 2009 survey on fuelbreak effectiveness by Colleen Mooney. A summary of survey findings will be presented by end of March 2012.

## COMMUNITY PROTECTION

### *Steve Hvenegaard*

#### PROJECT: IMPLICATIONS OF MULCHED FOREST FUELS FOR FIRE BEHAVIOUR AND VALUES PROTECTION

ISSUE	Mastication/mulching is widely accepted and used as a fuel management treatment. Little research has been conducted to document how fuel treatments using mechanical mastication will influence fire behaviour.
APPROACH	Increase our understanding of the physical properties of mulched fuels in various fuel types.
PLAN	Three sites have been established and a Master's student from U of Toronto will work on the project. Fire behaviour will be documented, including ignition tests. We will also develop a relationship between pre-harvest loads and mulch loads, and explore the moisture dynamics.

### *Greg Baxter*

#### PROJECT: STAND CLEANING

ISSUE	How effective is stand cleaning as a fuel treatment for community protection.
APPROACH	Test stand cleaning treatments with wildfire in predefined plots.
PLAN	Will locate and document plots in the NWT and then burn them. Also revisit Plot C which was cleaned 5 years ago. Fuel loads will be documented and we will burn with a control plot. Other plots may be found at the Horse Creek research site.
TIMELINE	We will present a final report in 2014.

#### PROJECT: UNDERBURNING

ISSUE	To determine if under-burning is an effective treatment based on cost and fire behaviour.
APPROACH	Case studies will be used to assess the effectiveness of under-burning.
PLAN	Plots will be found in NWT including a re-burn of a plot burned 5 years ago. Following burning these plots will be monitored and ignition tests performed on them the following years under extreme fire hazards.
TIMELINE	Depending on burn opportunities, a report will be completed the Fall of 2013.

### *Colleen Mooney*

#### PROJECT: TESTING THE EFFECTIVENESS OF 1-M CROWN SPACING AS A FOREST FUEL TREATMENT

ISSUE	3-m spacing has been tested and two case studies produced. Blowdown has been an issue in the Southern Rockies.
APPROACH	To thin pine stands to 1m crown spacing and test these with wildfire to document the changes in fire behaviour.
PLAN	Two plots have been prepared in the NWT that will be burned this season. Also working with ASRD to place plots in prescribed burns west of Rocky Mountain House (earliest burn date would be 2013).
TIMELINE	Case study completion will depend on opportunities to conduct burns.



## OTHER BUSINESS

### *Cordy Tymstra*

#### WILDLAND FIRE CANADA 2012

The Conference will be held on October 2-4 in Kananaskis, AB. The website is set up and ready to take registrations. Key point of conference is to bring science and fire management together.

### *Ray Ault*

#### RETURN ON INVESTMENT

FPInnovations is moving towards reporting the Return on Investment (ROI) for all projects. For example, we did drop testing for the NT in August 2011 and it would have been useful to know the overall value of that project. In the future, we will ask for input from the project proponents to help determine the value of the results and we will share these at each meeting. This will allow us to concentrate our efforts on high impact projects.

## PROJECT PROPOSALS

#### NSERC PROPOSAL – RAY AULT

A current NSERC proposal is being worked on by the University of Alberta where FPInnovations is considered the industry partner/supporter. The work involves both the Mechanical Engineering Department and the new Partnership in Wildland Fire Science. The project involves the development of a sensor to collect kW/m data and have this verified by wildfire intensity collected in the field. The University may have up to four graduate students working on this project.

#### GRASSLAND SURVIVAL ZONES – GREG BAXTER

ISSUE	Many injuries and some fatalities occur in grassland fires where volunteers make up the majority of firefighters. FPInnovations has completed 10 burns in grass fuels as part of developing a model for the survival zone study. The information collected to date would be useful in the development of guidelines for firefighters who frequent grass fires. This information could increase the safety of these firefighters.
APPROACH	To compile and analyse this data, and produce a report would take 3 months. We require a champion for this project to move forward.
COMMENTS	Group believes that unless someone steps forward to champion (i.e., fund) this project, it should not move forward as it detracts from the busy summer work schedule.

## NEXT MEETING(S)

October 1, 2012  
Kananaskis, Alberta  
Held in conjunction with Wildfire Canada 2012