Wildfire Operations Research

Advisory Committee Meeting Minutes
November 8, 2011

LOCATION

Alberta Innovates Technology Futures, Edmonton, Alberta

ATTENDEES

FPINNOVATIONS:

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

GOVERNMENT/UNIVERSITY/RESEARCH:

Bruce Mayer; Wally Born; Kevin Quintilio;	
Cordy Tymstra; Rory Thompson	ASRD
Kris Johnson	GNWT
Jed Cochrane	Parks Canada
Kerry Anderson	CFS
Mike Flannigan	CFS/U of A
Jay Woosaree; Marshal McKenzie	Alberta Innovates Technology Futures

INDUSTRY:

Rick Pederson	Conair Aviation
Revie Lieskovsky	Conair Aviation
Con Dermott	-
Jim Messer	Coulson
Phil Robert	-
Dennis Hulbert	-
Chris Lindsay	FTS
Wayne Wald; Brent Greer	FireFox Fire Solutions
Jay Simmons	Thermo-Gel
Rob Hyslop	Thermo-Gel BC (RGH Pacific))

Rick Solomon	Thermo-Gel (FireFox)
Gerry	-
Mark Campbell	ICL Performance Products
	-
K Olcheck	-
Mike Benson	BC WMB

ON-LINE PARTICIPANTS:

Darryl Jessop; Larry Freemont; Rob Cruise	SK Environment
Dustin Oikle	Nova Scotia
John Ross	Nova Scotia
Frederic Lefrancois	Wildfire

NEXT MEETING(S)

March 6, 2012
Alberta Innovates Technology Futures, Edmonton

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

PROJECT UPDATES

Greg Baxter

PROJECT: LESS-FLAMMABLE SPECIES

Project is nearing completion. We planted a 1 km stretch of fireguard above Chisholm, AB. One additional spring burn needed to complete data set and finish final report. We anticipate ASRD and Alberta Innovates Technology Futures to continue with implementation of the project results.

PROJECT: HARVEST DEBRIS MANAGEMENT

We are working with ASRD and Spray Lakes Sawmills. Project aims to determine balancing fire hazard/behaviour and silvicultural needs and is in two parts: (1) run fire behaviour scenarios using historical weather data and (2) conduct experimental burns which include IA crews. Expect to collect field data next summer.

PROJECT: SURVIVAL ZONES

Nine burns were ready for this year; however, we were unable to complete any due to a variety of reasons including weather, and wildfires and bad luck. Found three promising new sites in Saskatchewan and still have two in the NT for next year. We are also investigating an alternative approach using wildfires in observation zones to collect data next summer.

PROJECT: WESTERN PARTNERSHIP FOR WILDLAND FIRE SCIENCE

Greg Baxter now has an office at the U of A with the Partnership. The Partnership includes U of A, ASRD and the CFS. The FPInnovations fire group is committed to helping the Partnership succeed.

QUESTIONS/COMMENTS:

1. K. Johnson
   Q: YT (Karina) is interested in survival zone burns. Has anyone talked with the YT?
   A: Jon Large has talked to her. We will follow up with her before next summer.

Jon Large

PROJECT: MULCHING

We built 15 km of mulch line in May in Alberta and the NT for research purposes. We conducted ignition tests on the new mulch in June. Moisture content, compaction and age all influenced ignitions. We have a number of areas in BC, NWT and Alberta to look at next year and are discussing ideas to speed up the delivery of research results on this project.

PROJECT: MISSOUL HEAVY EQUIPMENT WORKSHOP

Jon and Roy Campbell attended the workshop. It was a week-long workshop where we investigated and discussed research gaps and productivity rates (including groups of equipment). Our objective was to maintain a linkage with USFS equipment program and bring back to members a summary of current equipment development in the US.

Roy Campbell

PROJECT: IGNITION DEVICE MATRIX

Project focuses on equipment, applicability (positive and negatives) and guidelines. Gathered new concepts while in Missoula (MTDC). Project linked to ASRD Ignition Working Group. Attended four ASRD prescribed burns to observe and document appliances. Future includes looking at equipment innovations and demonstrations.

PROJECT: SPRINKLER DESIGN

Project looks at getting a greater vertical arc from sprinklers. There are four approaches to the project: field consultation, private sector research, consultation with USFS (San Dimas Technology Development) and work with the U of A Mechanical Engineering Department (Mark Ackerman) and Gary Dakin to design a prototype.

PROJECT: SASKATCHEWAN TOUR FALL 2011

Purpose of this trip was to expand research partnerships and search for potential research opportunities. We found three potential research sites: Jimmy Lake Air Weapons Range, Douglas Provincial Park and Last Mountain Lake Wildlife Refuge.

PROJECT: NORTHERN LANDSCAPE LABORATORY

This is on hold until an industry champion can be established.

Jim Thomasson

PROJECT: DRAGON PLOT

This is a Lookout Visualisation Tool to give accurate location and distance. The initial trial was at the Athabasca Lookout this fall. This product was demonstrated at the 2010 Detection Workshop.

PROJECT: BRIDGE TIMBER PROTECTION

These are CN directed projects. In 2011, 6 bridges lost costing 15$ M in loss and repairs. Exploring fireproof coatings, detection/protection technologies, fire spread rate (on bridges) and grass fuel hazard.

Ray Ault for Kerry McLaven

PROJECT: MONITORING MICRO-CLIMATE AND LITTER MOISTURE WITHIN A FIRESMART THIINNED STAND IN AB

The study aimed to observe and quantify the effect of FireSmart thinning standards have on fine fuel moisture content due to solar radiation and wind changes. The report is expected after the Christmas in the New Year. Collaboration with the Universities is part of FPInnovations' role in preparing future fire managers and supporting education with linkages to field operations.

Ray Ault

PROJECT: NT RESULTS

A new all-in-one sensor was built and tested in the NT; it collects video, temperature, CO data and fire intensity (kW/m) and is relatively portable. We worked on and tested a new fire behaviour assessment approach using a wildfire north of the site. The group also set up sites for next year's burning.

QUESTIONS/COMMENTS:

1. D. Jessop
   You should create a 'Floating Science Lab' where you make use of fires in Observation zones. Suggest development of a plan for this prior to next summer. Staff will present a plan for 2012 that includes wildfire.

Colleen Mooney

PROJECT: DROP TESTING IN STANDING TIMBER (SUMMARY OF CONTRACT RESEARCH)

We collected and compared data on canopy penetration and ground coverage from drops conducted by the CL-215 and two amphibious AT-802Fs. Tests were conducted at Hay River Tanker Base. A 100ft x 200ft grid was used with 231 cups. Ground evaluators were used for visual assessments to compliment the cup data. 10 drops over 2 days were completed. Data is still being analysed.

QUESTIONS/COMMENTS:

1. Speaker Unknown
   Q: Does the USFS plan to move forward on this?
   A: US has a similar project underway.
2. Speaker Unknown
   Q: Was the foam flowing down trees?
   A: Yes, it was visible in the video footage.
3. Speaker Unknown
   In-stand tests are difficult. The CFS did tests 1968-70 and found that the results did not differ from open grids so they determined they were not worth all the extra effort for similar data.

Jim Thomasson

PROJECT: GEL DROPS IN MEXICO APRIL/MAY 2011 (SUMMARY OF CONTRACT RESEARCH)

Our objectives were to (1) document the daily operations; (2) document the changes to fire behaviour resulting from of aerial gel application; (3) document Coulson Firewatch system outputs and how these are used; and (4) assess user needs thorough interviews and provide documentation. Jim collected data during the 15 consecutive days of Mars operations. The S-76 Firewatch helicopter was the Air Attack Platform and operated for 20 days completing additional fire mapping task.

QUESTIONS/COMMENTS:

1. Speaker Unknown
   Q: What was the gel concentration?
   A: 1.5%
2. Speaker Unknown
   Q: Did you do an FWI comparison with the weather?
   A: No. The data wasn't available and the focus was on the aircraft technology.
3. Speaker Unknown
   Q: Was spotting measured?
   A: We did not drop on head fire. Spotting was not measured.
4. Speaker Unknown
   Q: How many gallons were the drops?
   A: Went from 4000-7000 in three drops.

Steve Hvenegaard

PROJECT: COMPARATIVE ANALYSIS OF HOTSPOT DETECTION METHODOLOGIES

Ground- based infrared camera assisted vs. conventional practices - Can ground-based infrared technology improve hotspot detection results? Will use of ground-based infrared cameras expedite mop-up operations? We found operational efficiencies and enhanced productivity in mop-up operations can be achieved by using infrared cameras as a hotspot detection tool. Infrared cameras are able to detect hotspots that are not detected by conventional practices. Hotspot detection with infrared cameras and conventional practices are complementary operations. With cloudy or overcast sky conditions, the effective time frame for valid detection results can be extended.

QUESTIONS/COMMENTS:

1. C. Tymstra
   Q: Did IR find hotspots that conventional methods didn't and vice versa? Why?
   A: Yes. It was most likely time of day, user error, procedures.
2. R. Ault

Should we do a pilot study next summer? Is there support? After extended discussion the consensus is that this is a lower priority project. Given the response, this project is finished unless a member decides to fund it further.

Ray Ault

PROJECT: WILDFIRE ASSIGNEMNTS SPRING/SUMMER 2011

Jon Large, Steve Hvenegaard, Colleen Mooney, Greg Baxter, Ray Ault, Roy Campbell all had shifts on Alberta fires.

QUESTIONS/COMMENTS:

1. K. Johnson
   Q: Is insurance an issue when you go out?
   A: No. We are covered by FPInnovations.

Roy Campbell/Steve Hvenegaard

PROJECT: FIRE BEHAVIOUR DOCUMENTATION

Fire documentation this season included Evan Thomas and Mt. Buller both in Kananaskis. Fire behaviour documentation is an essential skill for our program and we are exploring if and when we provide documentation support to our members. We believe this is a useful tool for members but we need to work out the details. Future documentation opportunities might include: ongoing support to wildfire agencies to achieve research objectives; documentation and data for the UofT's Fire Behaviour Knowledge Base (FBKB). Future Initiatives include wildfire documentation using methodologies tested on prescribed burns.

QUESTIONS/COMMENTS:

1. K. Johnson
   Q: Will case studies be put into FBKB?
   A: Yes. That is the goal.
2. Speaker Unknown
   Q: Any agency problems inputting case studies?
   A: Human-cause fires may be a problem in Alberta for legal reasons.
3. C. Tymstra
   Q: Any thoughts on a Rapid Response Fire Behaviour Documentation Team as done in the US?
   A: FPInnovations could transition to that role but it would require a process with the provinces for dispatch.
4. Speaker Unknown
   Q: Who oversee input into the FBKB?
   A: There is a website coordinator that oversees this.

Jon Large

PROJECT: COMMUNITY PROTECTION - UNDERBURNING

Is under-burning an effective treatment option in Canada? Is this a treatment that should be researched? Our proposed methods are to test the effectiveness by establishing plots, under-burning, and then running an intense fire through the treatment followed by monitoring. Is there interest for this project?

Parks Canada	- Yes. We have interest; it can be used for guard units.
BC	- Yes. We have interest.
Alberta	- Yes. There is support. It can expand the burn window for prescribed burns.

QUESTIONS/COMMENTS:

1. Speaker Unknown
   Make sure there is a control site available to match the plots.

Greg Baxter

PROJECT: COMMUNITY PROTECTION – STAND CLEANING

Involves the 'cleaning' of a stand to reduce fire behaviour through the removal of dead and down, pruning lower branches and the removal/and or burning of excess surface fuel. What are the costs and gains to the site using stand cleaning as a treatment? Plans for 2012 include: cleaning plots; documenting loads and stand density; instrument site for data collection; burn plots and collect data. We are looking for collaborators with potential sites to study and burn.

QUESTIONS/COMMENTS:

1. C. Tymstra
   The challenge is to define what stand cleaning means – what part of the treatment affects the fire behaviour? Need to be careful with this.
2. Speaker Unknown
   Maybe you could integrate this with the PB program.
3. Speaker Unknown
   Need to develop a long-term study for all treatments. Strategy is important. There needs to be clear deliverable, objectives, etc.
4. R. Campbell
   Is there a need for a steering committee to keeps us on the right track?
5. R. Ault
   We will look back at our project plans, expand and clarify objectives and methods, etc.

Colleen Mooney

PROJECT: COMMUNITY PROTECTION – THINNING

Thinning to 3-m crown spacing is the guideline recommended by FireSmart. This guideline was tested by FPInnovations and shown to be effective at reducing fire behaviour. However, thinning stands to 3m crown spacing has resulted in blowdown in some Alberta regions (Bragg Creek, Nordegg). So now we are studying 1-m crown spacing. We have 2 plots in the NT ready to go and we are working with ASRD near Rocky Mountain House to establish more.

Jon Large

PROJECT: COMMUNITY PROTECTION – MULCHING

Mulching is often a part of mechanical thinning operations as a method for brush/vegetation disposal. There is a grid-mulch pattern being evaluated in Alberta at Rainbow Lake and in the NT. We conducted ignition tests on old and new (1 month old) mulch in 2010 and we want to test the effectiveness as firebreaks in the future.

Rex Hsieh

PROJECT: WEB-BASED SHARING PLATFORM FOR FIRE DETECTION

Rex completed a web-based platform for fire detection as requested at the end of the detection workshop. It is a Facebook site – search using “Wildland Fire Detection”.

PROJECT: WEBSITE UPDATE

FPInnovations new wildfire operations research program website will be on-line soon.
www.wildfireoperationsresearch.ca

PROJECT PROPOSALS

1. OPERATIONAL PRODUCT EVALUATION METHODOLOGY

AB and BC provided similar proposals to develop methods of evaluating the effectiveness of water enhancing gel products. Currently there are no performance measure criteria. Agencies require a methodology to determine how it 'really' performs in the field.

QUESTIONS/COMMENTS:

1. Speaker Unknown
   Q: Would all companies still need to first pass the QPL testing first before any operational testing?
   A: Vendors could seek FPInnovations field evaluation once their product is listed on the QPL. The project approach is to simply develop an approach for testing.
2. K. Johnson
   A potential partner may include the UofS NSERC – start there.

2. GEEK SPEAK CONFERENCE

A radio communications workshop put forward by K Johnson, NT. In 2007 in Prince Albert, SK a Communication Technician/IT Conference was held. Could FPInnovations organise another conference of this type relating to fire? The conference could include topics like radio communications, weather data and the transmission of fire- related data.

QUESTIONS/COMMENTS:

1. BC
   Our interested parties would be Dave Millar's group. You could include weather stations, texting, videos.
2. AB
   This could be hug and there is value in it for the CIFFC Weather Group. It could be a national conference, but the focus would be the challenge.
3. PC
   The scope needs to be narrowed down.
4. SK
   Technicians would benefit, but travel for this group may be a problem.
5. R. Ault
   FPInnovations will write up a proposal with the NT and then send out to the group. Darrin Litaker will work with Ray on this.

POST MEETING BREAKOUT SESSION 1

COMMUNITY PROTECTION

Attendees:

Greg Baxter, Jon Large, Roy Campbell, Steve Hvenegaard, Kris Johnson, Cordy Tymstra, Colleen Mooney, Mike Flannigan, Kevin Quintilio (+2 others)

Presentation:

None given.

Discussion:

C TYMSTRA

We require a strategy that is a comprehensive fuel management study to look at both the short- and long-term implications. We should establish an overseeing committee.

Check out TED (Technical Enterprise Design) from Oxford – 5 minute clips on technology. See Complexity Design.

K QUINTILIO

What are we trying to find? When things don't work? That is the threshold we should know. Knowing this allows strategic treatments to be implemented.

Where are we at; what research have we done; where do we want to go?

We need better communication (i.e. project plans to members).

M FLANNIGAN

A workshop is needed; an ASRD strategic plan. FPInnovations could model where to do field tests and what to do it on.

Partners in Protection – meet in two weeks at the Canadian Council of Forest Ministers Fire Management Working Group. We should wait to see what comes out of it and continue the short-term projects.

OTHERS

Comprehensive Solution – 3 Zones may not be circular.

Need to catalogue what is taking place for current approaches. Is there a better way?

Provinces needs to determine short/long terms strategies and pass on to FPInnovations.

We could have a workshop to determine this.

How to get community buy-in? We could provide the science and let communities choose their own comfort levels. This is a socially driven issue.

Information Transfer – need to get to the right people - YouTube?

Wildfire Canada 2012 Conference – Wednesday is the national FireSmart workshop and field trip.

Slave Lake Review – recommendations, fuels…lead to SRD and FPInnovations.

Could develop a current situation map of what is taking place and where.

POST MEETING BREAKOUT SESSION 2

AVIATION GROUP – DROP TEST TECHNOLOGY IMPROVEMENTS

Attendees: Ray Ault, Jim Thomasson, Jay Simmonds, Jim Messer, Rob Hyslop, Rick Peterson, Revie Lieskovsky, Dennis Hulbert, Gerry Giseler, Mike Benson and others.

Presentation:

J THOMASSON

3 technology options:

1. Precision GPS Aircraft Tracking – Biggest error when drop testing is speed and altitude of the aircraft. Survey technology can give cm accuracy. Cost to invest ~$15K.
2. Cup Holder Technology – U of A design project, units $7-$15 each. Ergonomic design off the ground to prevent back strains. Current units met needs but now that drop tests are more frequent, investment in 2-3K units.
3. Data Collection Strategy – Proposal from a radio frequency ID (RFID) company to automate the data collection and reduce errors. System would collect all data requires so no manual inputs would be required. Development system $30K, additional units $4K. Requires formal requirements definition and costing. Ultimate goal is to reduce error, increase efficiency and perform tests with less manpower.

Discussion:

The discussion centered on the high costs and if it was worth it. What did USFS do? Could USFS equipment be used for Canada? Would equipment be available when needed?

R LIESKOVSKY

Suggested we contact USFS and see if there is potential for equipment loan/sharing and what the process would be.

OTHERS

Could automated weigh device be used in the grid? USFS has developed prototype 3 years ago which was ~$500. With volume and tech increases, might be able to get to $25-$50 each. With a large grid, that is a significant investment.

R AULT

Ray suggested that everyone consider these ideas and that a decision could be made at the spring meeting.

AVIATION GROUP – GEL RESEARCH AND THE WAY FORWARD

Presentation:

R AULT

Ray presented that we have done considerable gel research in the past and what did the group want for the future.

Discussion:

The discussion centered on gel test methods and results, and a desire for gel companies to be involved with fire science.

R LIESKOVSKY

Revie agreed that agencies need to know how gel performs and at what cost, economics are important.

R AULT

Ray suggested future direction describing the interaction of gel and the surface of vegetation may be more useful than our previous focus on evaporation rates.