

**Wildfire Operations Research  
Advisory Committee Meeting Minutes  
April 4, 2017**

**LOCATION**

Alberta Innovates Technology Futures, Karl Clark Rd, Edmonton, AB

**ATTENDEES**

**FPINNOVATIONS**

Dominik Roser

Ray Ault

Greg Baxter

Steve Hvenegaard

Rex Hsieh

Dalibor Houdek

Razim Refai (U of Alberta)

**GOVERNMENT**

Dave Schroeder, Quentin Spila,

Alberta Agriculture and Forestry

Jillian Moorly, Cordy Tymstra,

Alberta Agriculture and Forestry

Chris Dallyn, Paul Maczek (on-line)

Saskatchewan Environment

Kerry Anderson, Ginny Marshall	Canadian Forest Service
Wes Steed	Government of the Northwest Territory
Dave Bokovay	Canadian Inter-Agency Forest Fire Centre
Jonathon Boucher	SOPFEU
Ted Szabo	Alberta Innovates Technology Futures
Tom Burton	AMDC's

### **Industry**

Revie Lieskovsky	Conair Aviation
Cliff Henderson	Forest Resource Improvement Association of Alberta
Peter de Bruijn	BRUIN Fire Service / BUDENHEIM
Terry Popowich (on-line)	Discovery Air / MAG
Rick Solomon, Troy Much	FireFox
Travis Holder	Campbell Scientific
Duane Floden	Barracuda
Ross Bennett	Office of the Fire Commissioner
Spence Sample	Office of the Fire Commissioner

Missing from FPInnovations: Jim Thomasson (in Australia working with Coulson) and Roy Campbell (hip surgery)

For a review of all presentations please see:

<http://wildfire.fpinnovations.ca/AdvisoryMeeting/2017Spring/PresentationList.aspx>

## **Welcome and introductions**

- Approval of fall minutes: Dave Schroeder (AAF), seconded Quentin Spila (AAF)

**FPInnovations Strategic Plan** (D. Roser). Please see:

Dominik presented FPInnovation's Fire Groups Strategic Plan under a new business model. There is opportunity to grow the program with new funding possibilities. He then presented a slide with our 'National Wildfire Program Targets'.

Growth of the Program could be national in scale, but Western Canada would be the immediate priority. This would include possibly adding BC (potentially soon) and then following with other western provinces. Once established we would move to eastern provinces.

The Canadian Wildfire Strategy would be a key component of expansion to the east.

Funding Initiatives:

- Province of British Columbia
- CN Rail – hazard mitigation and fire detection around wooden structures. Infrastructure protection.
- FRIIA – community protection proposal (sprinklers).

**FPInnovations News:** After 16 years as the Fire Group's Leader, Ray Ault is stepping down to pursue other endeavors. With a new strategy, Ray has decided to make room for a new program leader that will implement the strategy over the next several years.

The job posting will be out soon. Please circulate when it does come out.

**Budget Update:** At the Fall 2016 Advisory meeting our budget was presented and we were going to be in a deficit position. Subsequent to this, Alberta added some funding combined with our cost-cutting measures allowed us to finish the year breaking even. Fire Group will be on firm footing moving forward.

Dominik then introduced Dalibor Houdek from the Edmonton office of the Forest Operation side of FPInnovations.

### **List of Completed projects 2016/17** Ray Ault

1. National forest fuels management reference database extension and training service.
2. Saskatchewan challenged forest fuels treatment case studies. Final edits. Posted soon.
3. An in-line mixing kit for helitorch systems. Final report in process.
4. Design and evaluation of a new wildfire sprinkler. On web.
5. Phos-chek foam fast solid and scotty foam fast applicator evaluation. On web.
6. Evaluation of firebozz sprinkler. Final edits.
7. Manufacture of ground based torch system. Built for NWT. InfoNote out soon.
8. Summary of survival zone work completed 2008 to 2016. PPT to HTC. Report in editing stage.
9. Literature summary “use of breathing protection for wildland firefighters”.
10. UAV information sharing workshop. No report. Workshop completed. There is an InfoNote in progress.
11. Quantification of the relationship between fuel load, coverage level and fire intensity. Completed and given over to Ontario.
12. Canopy penetration of airtanker drops in forest fuel treatments and untreated stands. On web.

Comments: Dave S – do we need more drops? Different stand densities versus different coverage levels. Maybe this is a math problem??

Revie L – half the drops had more than half of drops off the grid.

Ray – will we learn more if we do more drops?

Revie L – we can interpolate data. Do not need more drops.

Ray – see what Ontario finds – then re-visit.

Quentin S – this was meant as a Visual Project to demonstrate that air tanker drops on open stands getting more on ground. We accomplished that. This was not an exhaustive comparison of coverage levels.

13. Develop rapid response kit for documenting challenged fuel treatments.

Delivered to YK and on web. Next step could be to Field Test methods.

14. Developing a test method to compare the relative performance of wildfire chemicals (canister). Razim Refai.

[http://wildfire.fpinnovations.ca/AdvisoryMeeting/2017Spring/0945\\_3\\_The\\_rmalCanister\\_Razim.pdf](http://wildfire.fpinnovations.ca/AdvisoryMeeting/2017Spring/0945_3_The_rmalCanister_Razim.pdf)

Q) What did Missoula think of this approach? A) Missoula uses a different approach for same issue, but thought approach was sound.

Q. Spila – for retardant tests – seems to be that ‘stickier’ lasts longer. For suppressants – apply at a certain temperature; determine how much water is needed to lower the HFI.

Ray A – this is a comparative test to compare all products. Apply and observe effect.

Revie L – effect is what we are interested in.

Ray A – believe more work needs to be done. We have done just a part of a big Project.

Cordy T – how did you apply? A) Treated and put in canister. 30 second time lag.

Ted Szabo – are you going to field test? A) ?? Apply in field??

Rick S – there are a lot of products that all differ slightly.

15. Radio communications wildfire agency interoperability workshop 2017. Directed for telecoms industry. Workshop on March 7-8<sup>th</sup> 2017. There is a Post-Workshop Survey. Presentations from Workshop on website.

### **Technology transfer and Collaboration**

1. NZ Wildfire Conference and Collaboration opportunities. Discussed Conference, similar projects and the current process of setting up an MOU with NZ's Scions Fire Research Group. Also discussed the possibilities of a Study Tour of which Greg B will investigate. A study tour provides members with opportunity to learn from others directly. Very good investment. An example is the MTDC trip to learn about fire chemicals. Learned about aerial fire use and effectiveness project. If we did not go there we likely would never have made the connection and this will be very useful when we do our gel field work this coming summer.
2. USFS Missoula Technology & Development Centre. Rex, Ray and Razim traveled to Missoula in February. Purpose of the trip was to gain knowledge on wildfire chemicals through the exchange of ideas and experiences with QPL. Key take-away was the 'Aerial Fire Use and Effectiveness Project' which had 4 mobile units with 4 people in each that head to field and document aerial firefighting effectiveness.

Dave S – are these units for fixed and rotary wing? A) Yes. If they can't bring these units up, could we send a person down to tag along? These units drive to fireline and ground truth with their equipment. They may spend days on the fireline.

Lower mix-ratios do not lead to fewer equipment problems (corrosion). Actually can lead to more problems as water may dilute corrosion inhibitors. Also, more QPL problems at lower mix-ratios than at higher mix ratios.

**Ongoing Projects** – plans, discussion, approval to continue...

## 1. Forest fuels treatments

[http://wildfire.fpinnovations.ca/AdvisoryMeeting/2017Spring/1040\\_1\\_ForestFuelTreatments\\_Steve.pdf](http://wildfire.fpinnovations.ca/AdvisoryMeeting/2017Spring/1040_1_ForestFuelTreatments_Steve.pdf)

Key points from discussion:

- The National Fuels Management Reference database is available for data entry from case studies and experimental fires. Rex has made several entries and agencies are encouraged to contribute data also.
- Forest fuel treatments should be considered as opportunities for 'offensive' suppression strategies when wildfires threaten values. Further discussions should focus on how treatments can be strategically utilized during wildfire encounters.
- Pelican Mountain FireSmart research area provides excellent opportunities for fuel treatment research
  - Cluster retention
  - Fuels engineering and prescribed fire in black spruce fuels
  - Social Science research – communities visual acceptance
  - Specific forest fuels treatments should be chosen according to an ecosite-based decision process. This would aid communities, consultants, and FRIAA in determining the most appropriate treatment.
- A synthesis of current knowledge could support this decision process. The synthesis of knowledge would be based on findings from experimental fires in fuel treatments and case studies of wildfire-fuel treatment encounters.
- A synthesis of knowledge can help to identify knowledge gaps.
- Fuel treatment costs should be included.
- Fuel treatments identified in this decision making process can be modelled in Firetec to compare different fire behaviour scenarios.
- Communities are interested in aesthetics of fuel treatments and like to see how fuel treatments evolve. In areas of blowdown surrounding communities, hand treatments are more effective in maintaining acceptable aesthetics.

- Prescribed fire is one of the least expensive fuel treatment methods. Can innovations in prescribed fire techniques be developed that would be more acceptable to communities?
- A large volume of biomass is mulched or burned during forest fuel treatment.
  - Can this biomass be used for bioenergy and help to offset cost of fuel treatments?
  - Will the use of biomass be more economically viable in the future?

**Comments:**

Dave S – Wally B asking for case studies to be available for input into the National Fuels Management Database. Rex – they are already in there.

Ray – is there support to carry on? Rick S – need more studies. For example, should be looking at FireSmart treatments for ‘offensive’ purposes when wildfires threaten them (burn off lines).

Dave S – Pelican – will use Cluster retention where patches are treated. There is still lot to do. This includes Social Science to gather people’s thoughts on treatments.

Cliff H – We need a Decision Process based on ecosite. May not be wisest for Communities to dictate their wants. A process based on specific situations is required. A decision process could help to optimise spending \$.

Cordy T – an ecosite based decision process would be good. Would allow you to balance the trade-offs.

With the case studies that are completed and the test burns we can put together a First iteration of a Decision Process. Cliff H – the FRIIA Tech team could drive this. Best practices, tailored for ecosites; a Synthesis of all done to date.

Tom B – can use to show communities best methods to reduce impact. Can help to get this out to Municipalities.

Dominik R – summarize, target, build matrix. Then monitor effectiveness. Go in before treatment and after.

Ray A – summarize this summer: work we have done; fuels; treatments... what we have, what is missing. Then present in fall and identify gaps. Then work on pre-post treatments.

Dave S – treatments and costs should be included.

Cliff H – should be able to say “No” to what communities want to do. They need to accept ‘harsher’ treatments than they want.

Can use Municipalities to proceed on this.

McMurray can’t occur again – too costly. The re-insurers took heavy losses.

Chris D (on-line) – have areas of Sb blowdown where handwork is more accepted by community for looks. Need to document treatments over-time to show communities how the aesthetics change. Sask encourages work to carry on.

Ray – will bring a Matrix for decision support to the fall meeting. Then the Advisory Group can decide on how to proceed.

NWT – will communities accept PB’s? Treatments are expensive.

Kerry A – can model fire behaviour in matrix scenarios using Firetec. Then you are able to compare different scenarios.

Dalibor H – how much wood is taken and where does it go? Bio-energy? Capital Power is replacing coal with wood. In future can energy companies offset costs?

Cliff H – economics not there now. With phase out of coal there will be new energy sources.

Dominik R – reduce costs of FireSmart is good if include energy use of excess wood.

## 2. Design and manufacture thermal cube

Plans are to build 12 units this spring.

Dave S – will these be ready soon? For Pelican?? No. AAF wants 12 and others will probably want cubes as well.

Carry on Project? A) Yes.

### 3. Survival Zones

20 fires to date presented as case studies. Beginning to develop 'observations' firefighters can take to the field. Grassfire safety more advanced than forests at this time. Plans are to burn in NWT and JNP this spring/summer.

Revie L / Quentin S – how did this project develop? Initial questions? Believe outcomes here could lead down a 'slippery slope'. Could be legal implications.

Wes S – we have 2 plots at Fort Providence ready to burn. Will burn those if able, this summer.

Decision – wrap up project and deliver final report at fall meeting. Collect data in NWT to complete project.

### 4. Environmental Lapse Rate data collection

FPIinnovations has shown that atmospheric data can be collected by firefighting aircraft that is both accurate and accessible. Our part of the project is complete and will be written up and shared with community. If this type of data is valued, there may be a new question around implementation.

### 5. Linear utility corridors – BC Hydro project

BC Hydro has fall plans to develop two corridors and will be mulching on site. They will be working on a 'Sea to Sky' corridor as well as one over the Malahat on Vancouver Island. This work is funded by BC Hydro.

Should we continue Project? A) Yes.

### 6. Determining the effectiveness of water enhancing gel as a fire control agent

Have worked on this project since 2006, starting with gels on log decks then in wildfires, an experimental burn and on debris piles. FPInnovations has four approaches for this project in 2017:

- Work with AAF in field trials using a Heavy helicopter on a 40 day contract.
- Field trials of gel performance
- Develop test methods for relative comparison of wildfire chemicals.
- Survey of water enhancing gels use in NA

Should we separate gels and foams?? Want relative comparisons between the products.

Quentin S – how much extra protection is gained and at what cost? Need this type of answer.

Ray A – are the approaches put forward a reasonable next step?

Crib Testing – approach volunteer departments to find a test site.

Check work done by Bruce Edwards on foam (from Vernon area).

Endorse moving forward? Yes.

#### 7. IA response capabilities in harvest debris

Put 2 year burn window on project. Then re-visit. This is timely as new Directives for Debris management are close to coming out.

### **New Projects**

#### 1. Comparison of mulching and manual fuel treatment effectiveness

Lingering questions regarding effectiveness of fuel reduction (motor manual) vs. fuel displacement (mulching) treatments.

Work has been completed on this and plans are for burning at Pelican Mountain research site on May 8 (approx.).

## 2. Reducing black spruce hazard through fuels engineering and prescribed fire

Explore methods for preparing black spruce fuel stands so that fuels will burn at a lower fire hazard level.

Revie L – this is a 3 year project. How do you budget for this? What if milestones are not met (such as poor burning conditions)?

These projects are brought back as on-going projects and are presented and discussed. This allows group to monitor progress.

Dave S – AAF 90% confident they have the funding to do treatments this winter.

## 3. Motor manual fuel treatment productivity

The cost-effectiveness of manual forest fuel treatments is not well documented and understood. Motor manual treatment completed at Pelican (chainsaw) primarily in black spruce.

Discussion centered around hourly rates vs contracts and the work ethic difference between the two. Require benchmarks of productivity by fuel type and density. Need to set parameters around the project to answer one question now and then move to others. Need a price/ha.

## 4. Field trials and evaluation of fire behaviour data collection methods: Follow-up to the rapid response kit project.

Need to field-test the data collection methods identified in earlier report. Need to be user friendly, compatible with the new National Fuels Management database and then modified to improve use.

## 5. Wildfire chemical effectiveness in fuel treatment

Project to document Phos Chek 95A retardant effectiveness in mulch fuel at May 2017 Pelican Mtn burn. Still determining how to apply retardant. How long will long term retardant stop fire from spreading in mulch?

Cliff H – is your control plot ‘no treatment’? A) Yes.

Revie L – mix and then bring to site and apply. Start at Coverage Level (CL) 8 and then work down. Try a number of CL's.. 4, 6, 8.

#### 6. The next generation infrared cameras

AAF would like to find a new suitable IR camera for future purchase. AAF has been using the FLIR Scout.

Comment – survey the municipalities and see who uses what and their thoughts on them.

Troy M – has cameras to test. FLIR over photo.

#### 7. Infrared technology applications in wildfire management using UAV's

This is an IR Tech application – requires a State-of-use review.

#### 8. Infrared hotspot prototype construction & evaluation

We have 2 designs. This summer we will build the prototypes and test them.

#### 9. Next Generation helitorch

Goal was to build an aerial torch with in-line mixing (as with the ground torch). This has been built and the issues have been worked out. But now, AAF would like something different.

#### 10. Windrow test burning project

With the transfer of land from Alberta to private land owners in the High Level area and the subsequent land clearing and debris burning, smoke has become a major issue when everyone ignites on Nov 1<sup>st</sup> when venting is generally poor. Are there other time periods when this burning may take place?

Comments – Cliff H – if you lose one spring fire you will be back to Nov 1<sup>st</sup> burning. Do a spring burn 'escape' fire history and the data will show this will not work.

Purpose of project is to provide science based information for High Level to use to determine burn practices.

#### 11. Firebox productivity and effectiveness trial

West Fraser is experiencing an increase in the size of hog fuel piles due to cheap natural gas prices. The goal is to work with Forest Operations and West Fraser to determine if the use of curtain burners is an efficient way to eliminate the excess fuel.

At this time the project is uncertain as we have to wait to hear if West Fraser is still interested.

#### 12. Hummingbird Watch detection

Hummingbird uses a 'crowdsourcing' methodology to detect smoke in an operational setting. FPInnovations will document the system to determine the efficiency. This project will try and utilise 'Defence Research and Development Canada' (DRDC) funding.

If no DRDC funding then project will be of shorter duration in Alberta.

#### 13. Sprinkler design and performance requirements

This project is meant to define appropriate technologies and approaches to protect structures from wildfires in Alberta. There has been an EOI submitted to FRIAA (which is the Forest Resource Improvement Association of Alberta). This is for a project that has been divided into four phases: background search; product development; product trials and implementation.

The primary focus of this work is effective water delivery systems suitable for community level protection. A comprehensive assessment of current approaches and knowledge gaps will be reported in Phase 1.

Next Meeting: proposed for November 7<sup>th</sup>, 2017.