

The Science to Prevent Outbreaks

Spruce Budworm Early Intervention

A STRATEGY TO ENSURE A HEALTHY FUTURE FOR ATLANTIC CANADA'S FORESTS



March 13-14, 2018 | Hugh John Flemming Forestry Centre, Fredericton, NB

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Spruce Budworm Early Intervention Strategy Science Workshop

Day One

7:30 **Registration**

8:30 **Spruce Budworm (SBW) Early Intervention Strategy (EIS) Project Introduction**
Dr. David MacLean, University of New Brunswick

8:40 **Dynamics and control of rising spruce budworm populations**
Jacques Régnière – Canadian Forest Service

9:05 **Aerial applications in support of EIS Project objectives**
Peter Amirault, Andrew Morrison, Gerry Cormier, Luke Amos-Binks – Forest Protection Limited

9:30 **Landscape level impacts of EIS on SBW, other herbivores, and associated natural enemies**
Rob Johns – Canadian Forest Service

9:55 **Break**

10:30 **A molecular assay for assessing spruce budworm parasitism**
A. Nisole, D. Stewart, Stefaniya Kamenova, Eldon Eveleigh, Alex Smith, V. Martel, Michel Cusson – Canadian Forest Service

10:55 **SBW parasitism and Lepidoptera community: how can the molecular biology help us?**
Véronique Martel (Canadian Forest Service), Rob Johns, Michel Cusson

11:20 **Epicenter formation and migratory behavior of adult SBW in eastern Canada: Implications for the rise and spread of outbreaks and EIS**
Rob Johns - Canadian Forest Service

11:45 **Modeling moth migration**
Jacques Régnière, Johanne Delisle, Yan Boulanger - Canadian Forest Service

12:10 **Lunch (provided)**

1:00 **High dispersal rates in the ongoing spruce budworm outbreak: implications for the EIS in NB**
Jeremy Larroque (University of Montreal), Rob Johns, Patrick M.A. James

1:25 **Insectivorous birds as indicators of future defoliation by the spruce budworm**
Marion Germain (UQAM), M.-A. Villard, L. De Grandpré, P. M. A. James, D. Kneeshaw, U. Vepakomma, J.-F. Poulin

1:50 **Using citizen science to engage and inform the public on budworm management: The Budworm Tracker Program - Emily Owens (Canadian Forest Service), R.C. Johns, D. Pureswaran, V. Martel, C. MacQuarrie, P. James, S. Bourassa, I. DeMerchant, E. Shanks, J. Candau, J. Bowden, H. Spicer**

SBW sex pheromone: effect of blend composition on mating and a potential trigger of female dispersal

Peter Silk, Eldon Eveleigh, Wayne MacKinnon, Lucas Roscoe, Glen Forbes, Roseanna Lamb, Gaetan LeClair, Peter Mayo, Katie Burgess, Sarah Weatherby, Martin Williams (AFC/CFS)

2:15 **1. Identification of the spruce budworm 5-component sex pheromone blend**

Peter Silk

2:25 **2. Anti-aphrodisiac pheromones in male spruce budworm**

Lucas Roscoe

2:35 **3. Labeling feral spruce budworm populations with Rubidium**

Wayne MacKinnon

2:45 **4. Mating disruption field trials for spruce budworm**

Wayne MacKinnon

2:55 **5. The balsam fir volatile, Maltol: why is it produced and its possible ecological consequences**

Martin Williams

3:10 Break

3:30 **Confound SBW - a new, sprayable, pheromone formulation for the mating disruption of spruce budworm**

Chris Riley (Agrifor Biotech)

3:55 **Results of three large-scale mating disruption trials in Quebec - *Jacques Régnière, Johanne Delisle (LFC-CFS)***

Day Two

8:30 **Advances in technology and demonstrated efficacy of endophyte enhancement in improving tolerance of white spruce to spruce budworm**

Greg Adams (J.D. Irving, Limited), David Miller (Carleton Univ.), Dan Quiring (UNB), Andrew McCartney, Pamela Nicks (Maritime Innovation Limited)

8:55 **Early intervention strategies against spruce budworm: modeling and DSS analyses**

David MacLean (UNB), Jeremy Gullison, Chris Hennigar, Bo Zhang, Shawn Donovan, Zhuoyi Nie, and Mingke Li

9:20 **Insect herbivory and tree diversity: effects of hardwood content on spruce budworm defoliation of balsam fir vary with outbreak severity**

Bo Zhang (UNB), David MacLean, Rob Johns, and Eldon Eveleigh

9:45 **Automated spatial selection of spray program areas as a precursor to operational blocking**

Chris Hennigar (FORUS Research), Jeremy Gullison (NB ERD)

10:10 Break



- 10:30 **Potential timber supply impacts of SBW in New Brunswick 2018-2030: what if EIS does not work?**
Chris Hennigar (NB ERD, FORUS Research), *David MacLean*
- 10:55 **Potential economic impacts of SBW in New Brunswick, under EIS and reactive forest protection strategies** *Eric Liu, Van Lantz, Chris Hennigar, David MacLean* (UNB)
- 11:20 **Early detection of spruce budworm infestation: upscaling of ground hyperspectra to satellite sensors**
Udaya Vepakomma (FPIInnovations), *Matthew Tomkins, Emily Owens, Rob Johns, Denis Cormier, Andrew Morrison, David MacLean*
- 11:45 **SBW defoliation detection using satellite remote sensing techniques: lessons from the past and future outlook -** *Parinaz Rahimzadeh* (UMaine), *Aaron Weiskittel, Daniel Kneeshaw, David MacLean*
- 12:10 **Spruce budworm early intervention: proactive communications and lessons learned –** *Chris Norfolk* (NB ERD)
- 12:30 **EIS-SBW Phase II: Plans for 2018-2022**
David MacLean (UNB)
- 12:45 **Workshop Close**

Healthy Forest Partnership:

