Coming Spruce Budworm Outbreak: Initial Risk Assessment and Preparation & Response Recommendations For Maine’s Forestry Community

Maine Forest Products Council Annual Meeting
September 7-8, 2014
Bar Harbor, Maine
Quebec 2013 SBW Outbreak Map
2007-13 SBW Outbreak in Quebec
90+% of the fir had damage. Some of the spruce was damaged. The photos don’t show it, but this is the condition affecting every stand on every hill and valley in the region. Currently there are 2.5 million ha in Quebec in a similar condition.

Only a stand sprayed twice with Btk was green (not shown). Quebec only sprayed 120,000 ha this year.
SBW Status in New Brunswick

Avg. SBW Pheromone Trap Catch
By Royama North-Middle-South Zones

Average Moth Catch (# moths / trap)

Year:
SBW Trapping and Defoliation in Maine 1955-2013

Spruce Budworm Population Indicators
Maine - 1955-2013

- mod-severe defol
- log avg light trap catch
- avg pheromone trap catch/16

Start of next Maine outbreak

numbers of moths
millions of acres
Maine SBW Task Force

Task Force Leaders:

• University of Maine
  • Bob Wagner, Director, CFRU Director

• Maine Forest Service
  • Doug Denico, Director

• Maine Forest Products Council
  • Patrick Strauch, Executive Director
Maine SBW Task Force

Objectives:

• Develop *Risk* assessment
• Develop *Preparation & Response* recommendations:
  • State government, forest managers, forest products industry, forest researchers, and wildlife biologists
• Raise awareness about coming outbreak for media and interested members of public
## SBW Task Teams

<table>
<thead>
<tr>
<th>SBW Task Team</th>
<th>SBW Task Team Leader</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monitoring &amp; Protection</td>
<td>Dave Struble</td>
<td>Identify methods and plans for SBW outbreak detection, prediction, and reporting, as well as available pest control options and impacts.</td>
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<tr>
<td></td>
<td>(Maine Forest Service)</td>
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<tr>
<td>Policy, Regulatory, &amp; Funding Strategies</td>
<td>Patrick Strauch (Maine Forest Products Council)</td>
<td>Identify existing and future forest policy / regulatory issues that need to be addressed, as well as strategies for funding options.</td>
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<tr>
<td>Wood Supply Impacts</td>
<td>Bob Wagner (UMaine)</td>
<td>Assess potential effects of outbreak on spruce-fir wood supply and effects of mitigation efforts.</td>
</tr>
</tbody>
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## SBW Task Teams

<table>
<thead>
<tr>
<th>Economic Impacts</th>
<th>Eric Kingsley (Innovative Natural Resource Solutions)</th>
<th>Assess economic impacts of outbreak on forest products forest landowners and forest products industry, as well as value of mitigation options.</th>
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</thead>
<tbody>
<tr>
<td>Forest Management Strategies</td>
<td>John Bryant (American Forest Management)</td>
<td>Identify and recommend potential silvicultural and forest management strategies before, during, and after outbreak, and address future forest conditions and ecological consequences.</td>
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<tr>
<td>Wildlife Habitat Issues</td>
<td>Barry Burgason (Huber Resources)</td>
<td>Assess potential impact of SBW on wildlife habitat, including deer wintering areas, riparian zones, and other key habitats, and recommend potential mitigation and planning strategies.</td>
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</table>
## SBW Task Teams

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<thead>
<tr>
<th>Public Communications &amp; Outreach</th>
<th>Mark Doty (Plum Creek)</th>
<th>Identify key communications issues associated with outbreak, and design a proactive communications strategy for various stakeholder groups.</th>
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</thead>
<tbody>
<tr>
<td>Research Needs</td>
<td>Brian Roth (UMaine)</td>
<td>Identify short-, mid-, and long-term research and information needs for key issues before, during, and after outbreak.</td>
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</tbody>
</table>
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Maine Spruce Budworm Task Force Leaders:
Robert G. Wagner
Director, Cooperative Forestry Research Unit, University of Maine

Patrick Strang
Executive Director, Maine Forest Products Council

Doug Denico
Director, Maine Forest Service

August 1, 2014
Timeline

• DRAFT currently being reviewed by Task Team members

• Publically reviewable DRAFT available this fall (~Nov-Dec)
Risk Assessment

5.8 million acres of spruce-fir stands at risk of some level of defoliation, leading to reduced tree growth and mortality over wide areas.

Balsam fir concentrations (as depicted on map) by average volume (ft$^3$/acre) by county in Maine, 2008. (Source: McCaskill et al. 2011)
Map of approximately 10 million acres of northern Maine showing areas of forestland classified based on susceptibility to defoliation by SBW. (Source: Legaard et al. 2013)
Potential Spruce-fir Yield Reductions

- Two studies completed:
  - Hennigar et al. 2013 – CFRU
  - Legaard et al. 2013 – NSRC
- Both studies conclude:
  - 15% to 30% maximum annual reduction in spruce-fir volume or biomass for moderate to severe SBW outbreak
  - Slow (40-year) recovery of spruce-fir following peak impact of outbreak
  - Impact similar (both severity and rate of recovery) regardless of when outbreak occurs over next few decades
Hennigar et al. (2013) concluded that nearly all spruce-fir volume losses can be prevented by:

- **Adaptive harvesting**
  - Reducing area of high-risk stands (i.e., those with high balsam fir and white spruce composition) ahead of outbreak

- **Foliage protection**
  - B.t. applications to high risk and valuable stands
  - Only 20% of area of affected area needs to be treated

- **Salvage logging**
  - Dead and dying trees
Projected Cumulative Spruce-fir Volume Reductions Under Various Management Scenarios

From Hennigar et al. 2013
Projected Maximum Annual Spruce-fir Volume Reduction Under Various Mitigation Scenarios

From Hennigar et al. 2013
Many Factors Different Today Than During 1970s Outbreak

- Less spruce-fir forest
- Younger spruce-fir forest
- TIMO & REIT ownership
- Better road system
- Better forest management technology
- More diverse forest products
- Higher mill capacity
- More diverse markets
- Less dependence on spruce-fir
- Better logging technology
- Better protection technology
- More policy & regulations
- Lower funding levels in government & industry
- More sensitive political environment
- Less entomology expertise

Challenges during coming outbreak will be very different than in 1970s-80s
Coming outbreak may not be as severe as last one

- Less spruce-fir forest
- Younger spruce-fir forest
- Pattern of alternating moderate and severe outbreaks (1970s was severe)
- Current outbreak center further north and out of prevailing winds compared to 1970s
- Reduced dependency on spruce-fir as mill furnish

Strictly speculative at this stage, but interesting indicators
Recommendations

>70 specific recommendations provided on:

- Monitoring strategies
- Forest management strategies
- Protection options
- Policy, regulatory & funding issues
- Wildlife habitat issues
- Public communications & outreach
- Research priorities
Monitoring Recommendations

- Engaging public in SBW monitoring
- Increasing number of pheromone traps in across northern Maine
- Continuing current light trapping system across northern Maine
- Conducting targeted aerial surveys (plane-based observers) across northern Maine
- Conducting egg mass or L-2 larval survey if pheromone trapping and/or defoliation surveys indicate a high probability of population intensification
Forest Management Recommendations

- **6-level stand risk categories based on species composition, productivity, age, value, access, and location**

- **Map location, condition, and concentration of high-risk stands**

- **Shift harvesting now and in coming years towards merchantable high-risk stands**

- **Stop precommercial and commercial thinning in stands where balsam fir and white spruce make up >50% of the composition**

- **Prepare action plans to salvage (or pre-salvage) trees that will likely be lost ality**

- **Seek and encourage markets for low-value trees**
Protection Recommendations

• 13 insecticide products with 4 active ingredients (B.t.k., tebufenozide, carbaryl, and flubendiamide) are approved by MBPC for aerial application over naturally regenerated forests to control SBW.

• Assess and map high-risk and high-value stands that they may be candidates for insecticide protection.

• MFS should develop plans for providing technical assistance on SBW management to landowners.

• Landowners with FSC certification and wishing to apply tebufenozide, carbaryl, chlorpyrifos, esfenvalerate, lambda-cyhalothrin, and naled should apply for temporary derogation from FSC Board of Directors.
Policy, Regulatory & Funding Recommendations

• Review Spruce Budworm Management Act to determine whether changes are needed given changes in roles and responsibilities of MFS and private landowners

• Determine personnel, financial, and timing needs for SBW monitoring within MFS and landowners

• Building and expanding MFS training programs and protocols for a joint state and landowner monitoring program

• Large landowners anticipating need for insecticide applications should explore cooperative organization for delivering aerial insecticide applications

• MBPC and MFS should work with insecticide manufacturers to ensure that products are available in sufficient quantities, and all regulatory compliance requirements have been met
Specific recommendations provided for:

- Mature softwood songbirds
- Deer wintering areas (DWAs)
- Riparian zones and coldwater fish habitat
- Early/mid-successional species of concern (lynx / snowshoe hare / moose)
- Rare northern butterfly habitat
- High-elevation habitats and bird species
Public Communications & Outreach Recommendations

Specific recommendations provided for:

• Public media
• Family forest owners
• Schools
• Environmental NGOs
Research Recommendations

Short, medium, and long-term priorities provided for:

• SBW monitoring
• Protection
• Forest management
• Wildlife habitat management
Thank You!