## Spruce Budworm in Maine

**From Tracking to Action:** Why now is the time to respond.

#### What is Spruce Budworm?

The Spruce Budworm (SBW) is a native moth that causes damage primarily to balsam fir and spruce species in Maine. Although SBW is normally present at low levels and controlled by its natural enemies, outbreaks

occur in Maine about every 40 years. In Northern Maine, populations are growing rapidly, risking a wider epidemic.



## Why is it a threat?

- SBW is one of the most damaging forest pests in North America. Larvae feed on the buds and needles of host trees, which, left untreated for several years, causes significant damage and mortality.
- Dead and dying trees can fuel wildfires, which can reduce air and water quality and impact wildlife habitat.
- Healthy forests sustain Maine's \$8.1 billion forest industry.

# What are the potential economic impacts of not responding to a Spruce Budworm outbreak?

The costs of doing nothing – or of acting too slowly – are heavy. A severe SBW outbreak in Maine, which could cause a reduction of 494,000 cords of annual wood supply – **equivalent to 40% of 2021 spruce/fir harvest** – is projected to cost:

- » Loss of 3,865 direct and indirect jobs -12% forest industry-related employment.
- \$794 Million of annual economic impact -10% of
  \$8.1 billion annual contribution to Maine's economy.

## What has happened before?

During the last SBW outbreak, in the 1970s and 1980s, more than 7 million acres of fir and spruce in Maine were damaged or destroyed. This caused a loss of hundreds of millions of dollars to the forest products economy, and affected employment in the industry and in connected economies.

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Quebec has been battling an outbreak since 2006. Quebec's management strategy has been to treat only 10% of affected acres a year. As a result, the outbreak there has expanded to 33 million acres. The province now is treating 2 million acres a year and losing millions of acres of trees yearly. The resulting high tree mortality has contributed to wildfires (causing poor air quality days in Maine), massive emissions of carbon into the atmosphere, and substantial lost economic and wildlife values. New Brunswick has developed and tested the Early Intervention Strategy (EIS), an approach that closely monitors the SBW "L2" populations (the overwintering stage of the SBW larvae). This information allows early detection and early intervention to reduce SBW populations. New Brunswick has documented success with the program, where SBW populations in early treatment areas have decreased by 60-80%, reducing the size of the potential treatment area in 2024 from 400,000 acres to 13,000 acres.

### What can we do to stop it?

- » It is crucial to act now, both to prevent mortality to our impacted forestland, and to stop the rapid growth of the outbreak.
- » Early Intervention is an integrated pest management strategy for maintaining healthy forests and healthy economies. There are two insecticides used to reduce the populations to endemic levels in targeted treatment blocks. The cost of implementing the EIS strategy to treat an estimated 250,000 acres in Maine in 2025 is \$15 million.
  - > EIS goals for landowners:
    - Protecting timber investments
    - Avoiding severe harvest losses
    - Maintaining long-term land value



- > EIS goals for the environment
  - Maintain wildlife habitats for terrestrial and aquatic species
  - Reduce wildfire risk from dead trees
  - Maintain water quality and current water temperatures



## Who will apply and oversee the operation?

- Landowners have formed the Maine Budworm Response Coalition (MBRC) to implement an efficient treatment response.
- MBRC and other private partners have engaged with Maine's federal delegation and the Mills Administration to seek assistance with funding the 2025 EIS program.
- The UMaine SBW Lab provides critical monitoring and testing services to keep partners and the public up to speed on the L2 populations in Maine.
- MFS will provide technical assistance and communications with landowners and the public regarding SBW and management options. Additionally, MFS will provide financial oversight for state and federal funds supporting the SBW response.

#### What is needed now?

The key is early intervention. The SBW can cause tree damage and eventually lead to mortality if management is not implemented.

Landowners collaborate with the UMaine SBW Lab to track where the budworm population is expanding rapidly. This allows for narrowly focused, cost-effective and precise intervention.

Aerial insecticide treatments will be focused in areas of building SBW populations to reduce populations and allow natural mortality factors to continue to keep the populations low.



See QR code on p. 1 for more information

— COST PER ACRE \$90

#### Stopping the Spruce Budworm is about early detection & early intervention

What are the treatment options? There are two active ingredients that effectively control SBW outbreaks under EIS:

#### Tebufenozide

BtK COST PER ACRE \$45

Tebufenozide is a minimal-risk active ingredient that targets moth and butterfly larvae by mimicking a hormone that causes the larvae to molt into the next life stage prematurely, causing them to die.

#### ENVIRONMENTAL IMPACTS

Because tebufenozide only works through larval ingestion, and only on certain insects, it is nontoxic to mammals, birds, and most insects – including bees – not in the Lepidoptera family. When applied following label directions, tebufenozide poses minimal risk to aquatic organisms that are actively feeding at that time. It is immobile in soil, with low risk of leaching into water.

### What are the environmental impacts and risks of doing nothing?

- While there are risks associated with any pesticide application and not all areas are appropriate for treatments, there are clear consequences for inaction.
- An uncontrolled SBW outbreak has the potential to damage millions of trees in Maine. Trees can only withstand roughly three years of defoliation before it results in mortality. During the last outbreak, the mortality rate of untreated spruce trees was between 30-66% and the mortality rate of untreated balsam fir trees was 84-97%.
- Standing dead forests contribute to many negative environmental impacts, including:
  - » Degraded wildlife habitats for terrestrial and aquatic species

» Diminished water quality and higher water temperatures

» Significant wildfire risk

Bacillus thuringiensis kurstaki (Btk), is a spore-forming bacterium that when onsumed by butterfly and moth larvae, produces crystal proteins in the gut, causing the insect to stop eating and die. ENVIRONMENTAL IMPACTS

Btk dissolves in the high pH insect gut, activating its crystalizing ability that causes caterpillar mortality. Because high pH is specific to butterfly and moth larvae, ingestion by other organisms does not produce the same effect, nor are the crystals released in soil or water. Like tebufenizide, Btk will only impact larvae actively feeding at the time of application.

