

Bugs & Diseases

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Canadian Council of Forest Ministers (CCFM) Forest Pest Working Group Workshop – Edmonton October 5th and 6th, 2016

Vulnerability assessment of forest pest monitoring policies and practices, under a changing climate

Forests are shaped, in large measure, by biotic and abiotic disturbances (e.g. insects, diseases, and wildfires). Natural disturbances can create diversity in forest cover, help to renew forests and enhance forest's long-term resilience. The distribution and occurrence of various disturbance agents depends on many factors and can be somewhat cyclical – within a range of variability. There are thresholds, however (beyond the natural range of variability), after which the effects of disturbances can become largely detrimental. A major factor in determining the range of variability is climate. Climate change is expected to affect future disturbance regimes. For instance, increases in the frequency and severity of biotic and abiotic disturbances could result, thus modifying the spatial and temporal range over which disturbances will occur. This may make some forests more stressed and less resilient, leading to increased losses of forest and associated resource values. Ultimately, this could impair natural resource manager's ability to meet sustainable forest management objectives.

Forest resource managers across Canada are always seeking ways to minimize losses due to disturbances. They employ a variety of policies and practices which are often informed by such things as monitoring and detection programs. A 2015 CCFM report (derived from input from Provincial and Territorial forest pest managers) found that consistent monitoring and detection of disturbances and -related research were seen as the most important aspects of addressing climate change-related forest health issues, yet, most reported a lack of consistent funding and limited or inconsistent monitoring. There is a famous parable from the Indian subcontinent in which a group of blind men examine an elephant. Each one touches only one part of the elephant. When asked to describe the whole elephant, each of them comes to wildly different conclusions. This parable encapsulates nicely the problems that can arise from the inconsistent and insufficient observations derived from current detection and monitoring

Alberta's eye on forest health

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Forest Health
and Adaptation

practices described by the country's various forest pest managers. This could leave natural resource managers vulnerable to incurring unacceptable consequences from future disturbance events, particularly given the uncertainties introduced by a changing climate.

To begin to address concerns mentioned above, the CCFM's National Forest Pest Strategy (NFPS) Working Group will be holding vulnerability assessment workshop for forest pest monitoring policies and practices across Canada. This facilitated workshop will be held in Edmonton on October 5th and 6th, 2016. Scientists, policy experts, and forest health practitioners from across the country attempt to identify the strengths and weakness of current practices and policies. Particular emphasis will be placed on adapting to anticipated changes to forest disturbance distribution, frequency, severity, and longevity given different climate change scenarios. A desired outcome for this workshop will be the development of adaptation options including the potential need for collaborative efforts to ensure that current and future monitoring practices and policies reflect projected climate-related changes to biotic and abiotic disturbances and associated risks to Canadian forests. Many times when discussing natural resource management, climate change is described as the "elephant in the room," perhaps workshops such as this one can help everyone operate in ways such that we can see the whole elephant and adapt accordingly.

Tom Hutchison—Edmonton

Peace River Staff Update

The Peace River Forest Health Team is back up to full team with the arrival of Matthew Gelderman as the new Forest Health Technician.

A recent M.Sc. graduate in forest biology and management from the University of Alberta, Matthew completed research on environmental associates of seedling growth rate, occupancy and occurrence of endangered whitebark pine. Two journal articles (one accepted, and published May 6, the other in revision) are the impressive result his hard work on this interesting and important topic. He has a great deal of experience as a teaching and research assistant throughout other ventures in academia. His personal interests include hunting, fishing, birding, and all forms of outdoor recreation – pre-requisites of living in the Peace country. Matthew was also a collegiate athlete with the King's University men's volleyball team and spent time coaching that sport. He brings a great deal to the Forest Health program and we plan to put his knowledge and skills to use.



Welcome Matthew!

Ryan Hermanutz — Peace River & High Level Forest Areas

What's the *BUZZ*?

♪ If you go down to the woods today, you're sure of a big surprise.
If you go down to the woods today, you'd better go in disguise. ♪

Or at least pack an EpiPen, because you never know what you'll run across. Last summer surveyors from TimberNorth, out of Athabasca, discovered these weird contraptions out in the woods. I was flummoxed when they asked me if they were some sort of bug trap. With a little bit of sleuthing, I was able to find out that these were most likely solitary bee houses. I still have no idea who set these up, or whether they were for some sort of research, or just to aid with pollination. This is where solitary bees are really important. I had no idea how important until doing a little research after these nesting boxes were brought to my attention.



Photo Gerald Klassen

Most people are familiar with the fact that bees are essential for pollinating many flowering plant species. But I think I would not be incorrect if said most people imagine the task of pollination being conducted by social colonies of bees, like the European varieties used to produce honey. Yet, according to a March 2013 article, by Eva Ferguson of the Calgary Herald, "Researchers have collected and examined data from 600 fields in 20 different countries, including Canada, and found that managed honey bees are not as successful at pollinating crops as wild insects, primarily wild bees."

On the Green and Gold Community Garden website, Morris Levine and Hal Hopkins state that in Alberta there are approximately 370 species of native, wild bees. Many of these are solitary or semi-solitary varieties. These bees are working hard to perform critical services for agricultural and, no doubt, other flowering plants important to forest ecosystems. An unfortunate thing, however, is that native bee populations are declining in most areas. So, if you do go out in the woods and notice bee nesting boxes like the ones pictured here, take a moment to appreciate the important work these insects do, and maybe even think about adding a house or two (if you can) at your place.

Tom Hutchison - Edmonton

Cole Schneider recently accepted the position as the Tree Improvement Field Forester with the Alberta Tree Improvement and Seed Center. He has both a degree in Forestry.

"My role as Tree Improvement Field Forester will involve the operational aspects of the genetic test sites throughout the province. This includes preparation and planting of new sites, measurement/maintenance of existing sites. There will also be challenges. One such challenge was living in a tent for my first week of work. There was no vacancy in any hotels in the county due to a Metis conference. I have since been camping in a small motorhome with a wife, 1-year old and a dog and will continue to do this until we move into our house on September 30th ... or we destroy each other."



Welcome Cole!

Aspen Defoliation Widespread in Alberta This Year

Many Albertans have witnessed widespread aspen defoliation this year. Alberta Agriculture and Forestry's Forest Health personnel annually conduct surveys to determine both the location and size areas affected as well as determine the causal agents of the defoliation. To date these efforts have indicated that the scale of the outbreak this year appears to be very large. Defoliation has been noted in many areas of the province. Ground checks, so far, have indicated the primary cause of the defoliation as being caterpillars from two species of moths – the large aspen tortrix (*Choristoneura conflictana*) and the forest tent caterpillar (*Malacosoma disstria*). The large aspen tortrix infestation extends over much of the southern and western parts of the province and the forest tent caterpillar outbreak appears to cover much of the central, eastern and north eastern areas of the province.



Large aspen tortrix larvae. Photo Mike Maximchuk

Outbreaks of such defoliating insects occur periodically in most forest ecosystems, sometimes covering vast areas in very short periods of time. Large increases in populations can occur when external forces (climatic conditions, diseases, natural enemies, etc.) fail to limit growth. Such occurrences are normal and are generally not detrimental to the long-term health the forests. In boreal ecosystems these insects are important for nutrient cycling and, despite negatively affecting growth in the short-term, actually play an important role in maintaining forest productivity.

Large-scale outbreaks normally last for about 3 to 5 years. Typically, forest stands in any particular area are only defoliated for a couple of years before the caterpillars move on to other areas. Defoliated trees experience lower growth rates and may be more susceptible to secondary insects and diseases. They may also suffer crown die-back or even die if they are severely defoliated over a number of consecutive years. In most cases, however, the trees re-foliate after the caterpillars cease feeding and actually benefit from the increase in available nutrients generated by the insects. Once the outbreak collapses, it can take a considerable amount of time before another one occurs. For instance, the average period between Forest Tent Caterpillar outbreaks in Alberta has historically been approximately 10 years.



FTC on NW Alberta highway in 2005. Photo Mike Maximchuk

It may not be pleasant aesthetically to have vast areas of aspen denuded of foliage, but in the absence of drought conditions, or other stressors, the trees normally recover very well. For more information on aspen defoliators, or other forest pest conditions in Alberta, please visit Alberta Agriculture and Forestry's Forest Health [website](#).

Tom Hutchison—Edmonton

Whitebark and limber pine 2016 field work: mid-season update

The nefarious pathogen that causes white pine blister rust was introduced about 110 years ago from Eurasia to North America, and repeatedly re-introduced since. It has spread almost everywhere there is a host plant, with a few exceptions. It has a complicated 5-stage life cycle: part of the time it lives on 5-needle pines (all 9 North American species are susceptible), and the rest of the time it lives on alternate host plants. Currants and gooseberries are the main

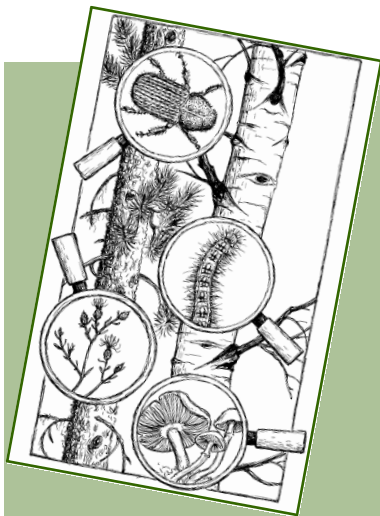
hosts, but it can also survive and produce spores on Indian paintbrush and lousewort (*Pedicularis*) species, which accounts for why there is often rust where there are no currants.



Host plants of the *Cronartium ribicola* fungus that causes white pine blister rust. Left: *Ribes lacustre*, centre top: *Castilleja* spp., centre bottom and right: *Pedicularis* spp.

Alberta has two endangered 5-needle pines: limber pine and whitebark pine. White pine blister rust is the main reason they are endangered. Provincial recovery plans were for both species approved by the minister in 2014. Agriculture and Forestry, as well as Environment and Parks, cooperating with Parks Canada and other agencies, have been working to implement the recovery plans, which contain actions ranging from seed research to health assessments to disease resistance screening, extension, and more.

Continuing last year's successful field season identifying and collecting cones from 85 limber pine trees that are candidates for rust resistance, crews are searching for more putatively resistant whitebark and limber pines. There is no collectible 5 needle pine cone crop in Alberta this year, so the focus is on identifying healthy looking trees in heavily diseased stands. These trees are marked, documented, and will be revisited when they have cones. So far 19 more whitebark and 44 limber pine trees have been identified and work is ongoing.



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Bugs & Diseases informs forestry
-related personnel about current

forest health issues.

Articles are welcome.

What's up Summer?

A poem in rhyming triplets inspired by Estonia's identical triplet Olympic marathoners.

As I drive around my town
The leaves are turning red and brown
I wonder what is going down

Has autumn come while it should be summer?
Because that would really be a bummer
And would make me feel so much glummer

But no, it can't be early fall
I haven't heard the cranes at all
And they're usually summer's curtain call

So, something different altogether
Has seemed to loosen summer's tether
Perhaps it's this year's funky weather

Droughty spring, sopping July
Could this have made the trees less spry?
Could this supply a reason why?

Is that what's really going down?
Has that made leaves go red and brown?
Hmmm...I'll ponder as drive through town.

Tom Hutchison—Edmonton

