



Forest Health Update – June, 2010

The following is a Forest Health Update describing conditions affecting southern Ontario's forests in Peterborough and Bancroft districts. This update has been prepared by Patrick Hodge of the Ontario Ministry of Natural Resources. Any questions or concerns can be directed via the email or phone contact provided at the top of each page.

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Program Update

The Ontario Ministry of Natural Resources forest health program works in conjunction with the Canadian Forest Service (CFS) in efforts to understand the current state of forest health at a provincial level. This information allows for control programs, educational events, transfer of scientific data, development of pest control methods and policy development for best management practices.

Many agencies both within MNR and from abroad contribute to the ongoing research and scientific support needed to sustain the forest health program. Staff from Ontario Forest Research Institute focus mainly on forest pathology and perform all taxonomic data for collections of fungi and pathogens while staff from the CFS contribute in all aspects of forest health, including entomology, pathology, the development of pest control methods, biological controls, pheromone/volatile trapping agents and the taxonomy of all insect collections.

Recently the OMNR went through an organizational realignment to strengthen policy focus and create clear lines of accountability. This realignment moved the forest health technical staff to the Science and Information Branch in the Inventory Monitoring and Assessment Section.

One of the main mandates of Science and Information Branch is to report on the status and trends of natural resources throughout the province. This provides an avenue for the work the forest health program performs. Program direction is still provided by Forest Health and Silviculture Section who consist of a Provincial Pathologist, Entomologist, Vegetation Specialist and three Regional Forest Health Specialists amongst many others.

In recent years there have been many staffing updates in which veteran staff retired, internal staff relocated and new employees joined.

The most recent announcements being the departure of Ed Czerwinski, whose long standing contributions to the forest health unit and technical abilities in both performing and mentoring will be missed. Ed Czerwinski has now been replaced by Patrick Hodge, formally the Forest Health Technical Specialist (FHTS) in Midhurst and Aurora Districts in which Susan McGowan now sits. Susan was formally the FHTS in Kemptville and Pembroke districts which is now vacant. Just prior to this, a seasonal staff member moved on from the Thunder Bay and Nipigon district work area leaving the unit with two vacancies, one in the northwest and the other in southern region, which is where we stand today.

Abiotic Events on Southern Region Forests

Spring 2010 will be remembered for its early arrival bringing extreme temperatures accompanied by very little rain. During the months of April and May temperatures in Bancroft and Peterborough districts averaged out to be roughly 19.3°C with record breaking extremes of 32.0°C and -6.3°C.

This early heat wave allowed the grounds to thaw and roots to uptake nutrients pushing new foliage out on many Southern Region species. Tree species that did flush out experienced extreme lows as temperatures dropped to -2.7°C in Peterborough District and -6.3°C in Bancroft District. This caused low-moderate levels of frost damage in most areas across the Bancroft District and in parts of Peterborough District to mainly maple, *Acer* spp.; elm, *Ulmus* spp.; and poplar, *Populus* spp. with white spruce, *Picea glauca* being the lone coniferous species affected.



Figure 1: Map showing Forest Health Technical Specialist staff and their work areas



Figure 2: Severe frost damage on sugar maple

Much of this frost damage went unnoticed with the exception of severely affected foliage as it wilts, turns black and hangs onto the stem (Figure 2).

The forested area that was seemingly unaffected or not showing signs of severe frost damage showed up two weeks later in late May, after extreme temperatures of 32.0°C hit Peterborough District and 33.4°C temperatures hit Bancroft District. The high heat forced foliage to transpire more moisture than it could take up, keeping in mind the lack of snowfall we had last winter and the lack of rain we had this spring, the young, still developing foliage could not keep up. As foliage develops it creates a waxy outer layer that protects it from extreme temperatures and from transpiring too much moisture. As maple foliage was still in the developing stage the waxy layer that coats the outside of the leaf was not well-formed and therefore moisture transpired at an accelerated rate.



Figure 3: Aerial view of frost damaged sugar maple. Note the ash spp. (bright green) unaffected as these leaves did not flush during the frost events May 10 through 12.

Shortly after this extreme heat the severity of frost damage was very evident. In Bancroft District from

approximately Hwy.62 west to Midhurst and from Bethany area in Peterborough County north to the district boundary was severely damaged. This abiotic event reached well into Parry Sound District, Pembroke District and Midhurst District causing a concern as the majority of foliage was not damaged enough to drop and re-foliate and not healthy enough to obtain full photosynthesis from the sun.

Forest Tent Caterpillar - *Malacosoma disstria*

This native defoliator feeds on numerous broadleaved species throughout the province with oak, *Quercus* spp; maple; beech, *Fagus grandifolia*; trembling aspen, *Populus tremuloides* and ash, *Fraxinus* spp. being the preferred hosts. Forest tent caterpillar got off to an early start in Peterborough and Bancroft Districts as trembling aspen leafed out by mid-April. Larvae will hatch from the over-wintered egg-bands in the upper crowns of preferred hosts. They feed for approximately six weeks at which time they create a cocoon and morph into the adult moth. Days later female moths mate, lay eggs and die shortly after.



Figure 4: Aerial view of severe defoliation on sugar maple caused by forest tent caterpillar along the north shores of Kawartha Lakes.

Approximately 60 000 ha of moderate-to-severe defoliation has been recorded in the Guelph, Midhurst, Peterborough and Bancroft Districts with approximately half of that damage occurring in Bancroft District.

A forested area approximately 1 200 hectares in size was severely defoliated just south of Tweed, Peterborough District as sugar maple, *Acer saccharum* foliage was completely stripped from the trees. Similar observations were made along the Bancroft/Peterborough border, particularly along the north shore of the Kawartha Lakes where nearly 8 900 ha of severe defoliation was recorded in Harvey, Burleigh, and Lake Townships. Approximately 2 000 ha of severe defoliation was also recorded within the north end of Bancroft District in Harcourt, Herschel and Cardiff Townships.



Figure 5: Late instar larva of the forest tent caterpillar

Spruce budworm - *Choristoneura fumiferana*

Populations of spruce budworm continue to persist on white spruce across the Peterborough and Bancroft districts with severe defoliation occurring in Balsam Lake Provincial Park and along hwy. 28 just south of Kawartha Highlands Signature Site,

Bancroft District. Approximately 110 hectares of severe defoliation was also recorded along Sandringham rd., Eldon Township, Peterborough District.



Figure 6: Severely affected white spruce in Eldon Twp., Peterborough District

In efforts to monitor spruce budworm, specific locations of spruce/fir forests are monitored on an annual basis across the province. Information collected at these sites will contribute to the overall spruce budworm monitoring project used to predict severity of spruce budworm defoliation in the following year.

Cedar Leafminer - *Coleotechnites thujaella*

This common pest of eastern white cedar, *Thuja occidentalis* is on the rise this year as early feeding by overwintering larvae is quiet evident throughout the work area. At this time larvae have dropped to the ground where they pupate into adult moths. Moths will mate and begin to lay eggs. Larvae hatch weeks later and begin to feed inside the narrow scale like leaves of the cedar tree. Larvae

will feed into fall where they over winter and begin the life cycle once again. Damage by cedar leaf miner can be quite severe when defoliation occurs on an annual basis although eastern white cedar can withstand a single year of severe defoliation quite well with very little dieback.

Special Surveys – beech bark disease (BBD), European oak borer (EOB), pine false webworm (PFW) & emerald ash borer (EAB)

This year the Forest Health Unit will be performing numerous special surveys across the province to improve our abilities in managing the forested area around us.



Figure 6: A high level of beech scale potentially vectoring BBD.

In Peterborough and Bancroft Districts a beech bark disease survey coordinated by John McLaughlin with the Ontario Forest Research Institute and Richard Wilson with the Forest Health and Silviculture Section is currently underway with two main objectives in mind. The first is attempting to distinguish the northern and western range of BBD, the second is to study the impacts of BBD on stand dynamics (e.g. shifts in species composition), wildlife (e.g. effects of reduced mast and cavity trees as large beech die),

the pathogen/host interaction, and to develop management strategies that encourage regeneration of disease-resistant trees (estimated at ~1% of the beech population).

These permanent sample plots will be focused in stands showing no signs of BBD but containing beech scale, an exotic scale insect that vectors beech bark disease (Figure 7).



Figure 8: A beech tree severely affected by BBD, (Inset) close up of the red fruiting body brought on by BBD.

One of many special surveys being coordinated by the Canadian Forest Service is for the European Oak Borer. This survey has been written up by Krista Ryall of CFS in efforts to define host species of tree and delineate where in the province this newly discovered exotic *Agrilus* spp. occurs. Currently we know the insect will feed on oak spp. in Ontario and is considered a secondary pest to oak, *Quercus* spp.; beech, *Fagus* spp.; blue beech, *Carpinus* spp. and chestnut, *Castanea* spp. throughout Europe.

This survey will be performed using sticky band traps in susceptible woodlands across

Peterborough and Bancroft Districts amongst others Districts throughout the province.



Figure 9: Kawartha Highlands Signature Site Park Biologist, Travis Cameron inspecting a European Oak Borer sticky band trap.

In addition to these surveys, a study to test the efficacy of a sex pheromone for pine false webworm will be put in place initiated in part by Taylor Scarr with the Forest Health and Silviculture Section and Peter Silk with CFS. This survey will occur in Peterborough District, however the majority of sampling plots will be set up in Midhurst District.

Last but not least a study will be performed to test survey methodology for early detection of emerald ash borer. This is a collaborative effort made by the Provincial and Federal Governments. Project leads are as follows, Taylor Scarr, OMNR; Krista Ryall, CFS; Troy Kimoto and Julie Holmes, Canadian Food Inspection Agency. This survey will be comparing a CFS initiated green leaf volatile prism trap, a CFS derived branch sampling technique and a CFIA approach to early detection.



Figure 11: Left: Branch sampling technique; Right: Green leaf volatile prism trap.

Results will define the best survey methodology known, allowing for fewer false negatives and a more defined extent of an infestation allowing management plans to take place. This study will be performed throughout Southern Region and will incorporate areas within Peterborough and Bancroft Districts

All photos taken by Patrick Hodge – MNR unless otherwise stated.

Any questions, concerns, or comments can be directed via the email or phone contact provided at the top of this page. If you know of any insects or diseases that are affecting the forests in your area please do not hesitate to call.

Feel free to pass this information along.

Thanks, Patrick Hodge
