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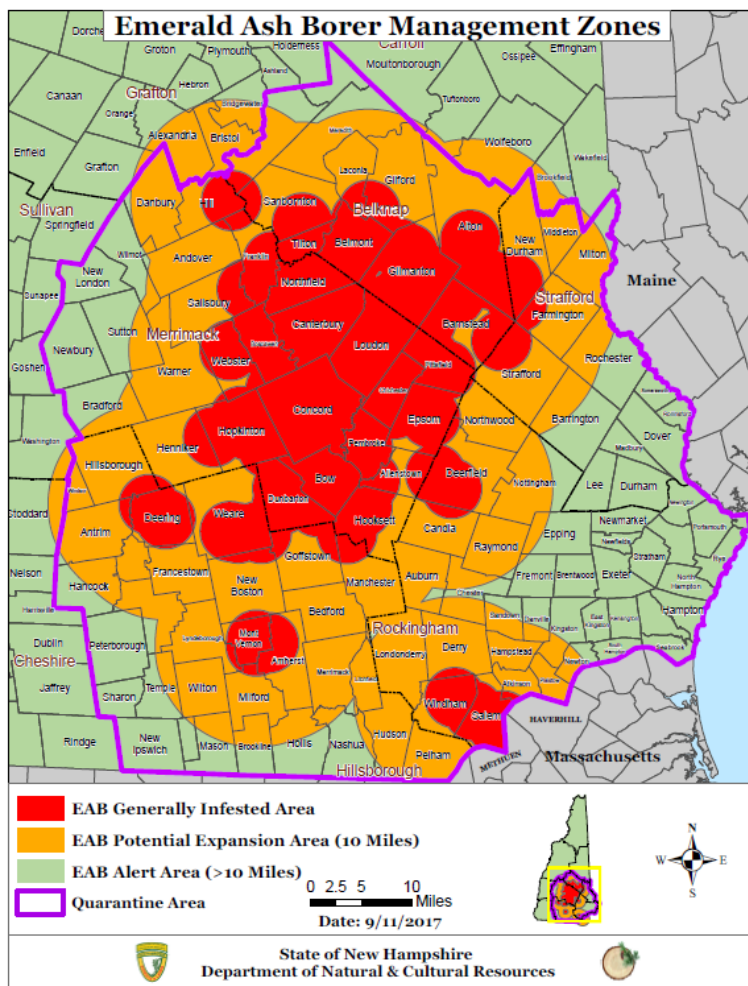
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http://maine.gov/dacf/mfs/forest_health/index.htm

Forest & Shade Tree - Insect & Disease Conditions for Maine
 September 25, 2017

This is the last planned *Conditions Report* for the season. We plan to provide an update on spruce budworm and winter moth late this year or early next; and will provide other updates as the need arises.

We're pleased to let you know that the *Annual Summary Report for 2016* is now available on-line from http://maine.gov/dacf/mfs/publications/condition_reports.html. They will be printed in the coming weeks and if you have a paper subscription to the *ASR* you will receive a hard copy when it is ready (expected by the end of October).



Regional Emerald Ash Borer Quarantine Expansion

Emerald ash borer has not been found in Maine. Late last week the emerald ash borer state quarantine in New Hampshire was expanded. Three trap-recoveries of emerald ash borer in Strafford County led to the expansion (the quarantine previously encompassed Belknap, Hillsborough, Merrimack and Rockingham Counties). Single beetles were recovered on each of three traps on the western border of the county, abutting the existing quarantine area in Belknap county. Though this doesn't represent a significant expansion of the known distribution of the pest, it is a considerable increase in the number of miles of Maine's border abutting an emerald ash

Map of current emerald ash borer quarantine area in NH, see nhbugs.org.
 Map: NH DNCR.

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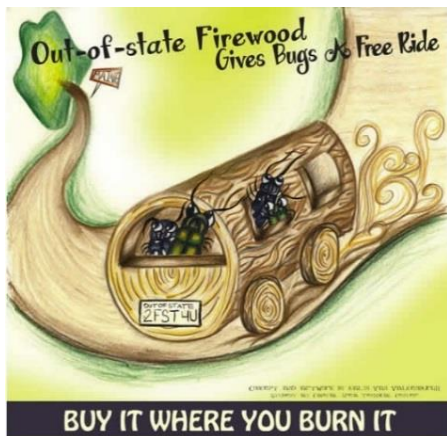
www.maineforestservice.gov

borer quarantine. New Hampshire has developed very clear guidance for movement of ash within their quarantine, which may buy us some time on spread from the generally infested area in New Hampshire. Notably, emerald ash borer was confirmed in Quebec City this summer as a result of routine surveys. Again, no emerald ash borer has been detected in Maine to-date. Maine Forest Service Information Sheet #28 is a resource on emerald ash borer for Maine Landowners. It is available on the Maine Forest Service website for download, or hardcopy by request (find the links at the bottom of this page: http://www.maine.gov/dacf/mfs/publications/information_sheets.html). Read more about the New Hampshire quarantine at www.nhbugs.org.

Use Local Firewood!

A recent incident brought home that focusing on a few invasive insects can mislead the public about the danger to our forests from imported firewood. A camp owner from out-of-state brought seasoned oak firewood to his camp in rural Hancock county from a suburban lot—the oak had fallen to “Superstorm Sandy.” This individual was aware of the threats to our forest from Asian longhorned beetle (ALB) and emerald ash borer (EAB), and expressed surprise that we were concerned regarding the oak he had imported since it was not a host for either.

We choose to highlight ALB and EAB because we have evidence that public detections are important in finding these insects in our forest and ornamental trees as quickly as possible. There are dozens of other threats to our forest that can move in or on firewood that the public will be less likely to recognize. They range from small bullet-shaped beetles that look nearly identical to our native bark beetles, to large longhorned beetles which again, look like our own, to microscopic fungi. The message, “use local firewood,” is less complicated than enumerating hosts and descriptions of some key insects of concern.



However, we will continue to provide information about these few “charismatic megafauna” with the hopes that you can help us find them, but with the caveat that they are merely the tip of the iceberg when it comes to new forest threats. Learn to identify those insects, their signs and symptoms, but keep aware of changes in tree and forest health, and report concerns beyond the most wanted list.

Please also help us spread the word to about firewood. Maybe you know a neighbor who looks at a trip to camp as a frugal and environmentally sensitive alternative to disposal of suburban tree waste. Consider helping your neighbor recognize the costs associated with that activity. If a neighborly chat is not enough to convince him or her to burn the wood immediately, or there is too much wood for immediate consumption, you can report your concerns to the MFS Forest Protection Division by phone at 1-800-750-9777 or online at http://www.maine.gov/dacf/mfs/rpt_concerns.html.

Because there is a quarantine on EAB in most states in the Eastern US, transporting firewood into Maine from out-of-state is often not only a violation of State rules, but also of Federal quarantine. Learn more at emeraldashborer.info and www.maine.gov/firewood.

Insects

Browntail moth (*Euproctis chrysorrhoea*) – Remember to inspect the tops of your apple and oak trees once the leaves have fallen. Look for leaves TIGHTLY webbed together at the very tips of the branches – usually near the top of the tree, but not always. These are the overwintering webs of browntail caterpillars; inside you will find dozens to hundreds of tiny sleeping caterpillars (less than ¼ inch long).

Go to http://www.maine.gov/dacf/mfs/forest_health/invasive_threats/browntail_moth_info.htm for pictures of webs and what to do if you have them, or call 287-2431 for additional information.

The Maine Forest Service will be doing the annual browntail winter web survey in January and February. This will give people a general idea of where the browntail is being seen. It is not a comprehensive survey, we cover main roads and known places of past infestations.

Populations are expected to be lower than in 2017 but still will be affecting a lot of people in a wide area, probably including new places not affected in past years.

Datana spp. (*Datana drexelii*, *D. ministra*) – Over the last month we have received several e-mailed pictures of *Datana* spp. From Ellsworth, we saw yellow-necked caterpillar (*D. ministra*) on shad bush and from Raymond and Portland, Drexel's *Datana* (*D. drexelii*) on blueberries. These caterpillars might go unnoticed if it weren't for their habit of feeding in large groups and acceleration of feeding as they grow.



Drexel's *Datana* on blueberry.
Image: M. Yusem.

Noticeable defoliation tends to happen towards the tail-end of the growing season and usually is not significant to the host plant's health. Small plants, or those that were defoliated earlier in the same growing season would be more sensitive. On small plants, such as blueberries, vigilant monitoring beginning in July and early hand-picking is a good approach to management. Egg masses are deposited on the undersides of host leaves; larvae skeletonize the undersurface of the leaf during the first instar. After their first molt, they will chew through both sides of the leaf, starting at the leaf margin and progressing towards the central vein.

Eriophyid mites – Eriophyid mites are a diverse group of mites that cause a wide array of reactions on their host plants. If you have noticed red felt patches (erinea) on maple leaves, finger-like projections from cherry, *Tilia* spp., or maple leaves, or fist-shaped galls attached to ash twigs, you have noticed signs of these mites. Some species are well documented, others, obscure. Most are not of concern from a tree-health standpoint. You probably would come to that conclusion by thinking about how the species is affecting the host's ability to capture and use energy. For the most part, trees with these mites can still photosynthesize at a reasonable level and are not expending unusual amounts of energy due to the presence of mites. Last month we received samples of erinea on bur oak from southwestern Maine and photos of the same from Caribou. This damage falls into the obscure category, and may be caused by *Eriophyes triplacis*. Control is not necessary.

Nuisance insects of fall and winter – Although we are part of the Maine Forest Service and our focus is forest insects and diseases, that doesn't stop questions coming in regarding the various insects that



Please report suspected sightings of the brown marmorated stink bug (left). The similar-looking western conifer seed bug (right) is not a reportable pest. Notice on the seed bug the slenderer profile, the flattened hind-leg and sharper head. Image: K. Coluzzi, MeDACF.

wind up in our homes looking for a safe place to overwinter. Chief offenders are **western conifer seed bugs** and **Asian lady beetles**. You can often see the invasion coming on fall days; dozens may congregate on the warm outside walls of your house. Although these insects can be startling and annoying it is the extremely rare one that does any damage to your home. The best defense is sometimes tolerance. You can also seal and screen any small openings as best you can and vacuum or otherwise capture and dispose of the insects that make it in. For further guidance on these house-guests, we recommend you consult the experts at The University of Maine Cooperative Extension Pest Management Office (<https://extension.umaine.edu/ipm/>).

One thing we'd like you to report is any suspected co-habitation with **brown marmorated stink bugs**, especially in numbers. This potential crop-pest has been found in New Hampshire, and this year for the first time, control efforts have been recommended on an orchard crop in that state. This is the time of year we expect folks will notice them if they have a foothold in Maine. You can report your finds to: <http://www.stopbmsb.org/where-is-bmsb/state-by-state/> or locally to Maine Cooperative Extension or Maine DACF. Be prepared with photos or specimens for examination.

Southern pine beetle (*Dendroctonus frontalis*) – In recent years, the US-native bark beetle, *Dendroctonus frontalis*, or southern pine beetle, has been expanding its range north from southern states and hosts. It has now been found as far north as Massachusetts. This aggressive bark beetle has been observed attacking pitch pine (*Pinus rigida*), eastern white pine (*P. strobus*) and Norway spruce (*Picea abies*) in the Northeast and killing trees on Long Island, NY. For this reason, the Maine Forest Service is concerned about the southern pine beetle continuing its northern expansion into Maine.

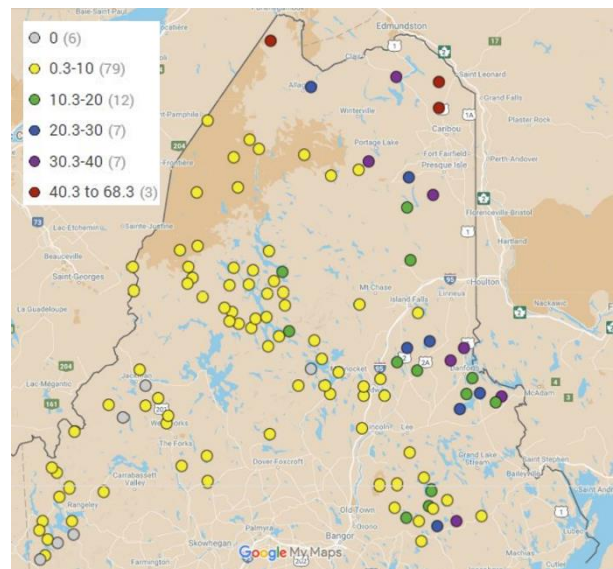
The southern pine beetle attacks weakened trees. Like other bark beetles, the first sign of their presence is pitch tubes on the trunk where the trees are trying to drown the beetles in sap. The beetles overwinter in all life stages and can have multiple generations in a year. Generally, infestations start in a small area and then spread out as the population increases with many beetles attacking the same tree to weaken its defenses.

The 2017 survey was conducted in ten pine stands, nine pitch pine and one red/white pine. There were seven sites in York County, two in Oxford County and one in Sagadahoc County. Surveys will continue in future years to monitor for this insect.

No southern pine beetles have been found in Maine to-date.

Spruce budworm (*Choristoneura fumiferana*) – The cooperative pheromone trap effort for spruce budworm is wrapping up for the year. As in the last several years, around 20 organizations participated in the program. Several cooperators have retrieved their traps and sent in their samples. Others will be collecting samples next month, concurrent with the Cooperative Forest Research Unit (CFRU)-led survey for overwintering larvae (L2 Survey). In addition, volunteers with the Healthy Forest Partnership Budworm Tracker Program have brought in their traps for the year and are sending in their catches. Together, the data from these sites should give us a decent picture of spruce budworm populations.

To date, about 27 percent of the MFS-Cooperator sites have been received and counted. Based on that sample, catches are on par with last year—down significantly from the summer of 2015. Across 114 sites, the average catch is about 9 moths per trap (average on the same sites was 6 in 2016). Catches range from 0 to 68.3 moths/trap. The highest catches are found in a 40-mile-wide band south of the northern boundary of the state. Sites in the eastern third of the state are trending towards higher catches than those in the western two thirds—this is apparent from Route 9, north to the St. John River.



MFS Cooperator SBW pheromone trap results as of 21 September, 2017; approximately 73% of sites have not been processed. Map Data: Google Maps

We anticipate receiving moths from more than 300 additional sites, and the picture could change before the dust (composed of moth scales in this case) has settled from those samples.

Elsewhere, observers recorded *very light* and scattered defoliation on the New Brunswick side of the St. John River between Madawaska and St. Francis in ground plots. Aerial survey and additional ground plots picked up about 3,700 acres of light, scattered defoliation in the northern third of New Brunswick. Defoliation has intensified on the Quebec side of the border as well, with increases in area and intensity seen in the Bas-Saint-Laurent region, which lies closest to our northwestern border.

In addition to participating in the CFRU-led L2 surveys, MFS will conduct targeted surveys of host stands in the coming months in regions closest to the observed defoliation in Canada, and in response to high trap catches.

Winter moth (*Operophtera brumata*) – When you are out in the woods this fall and winter, keep an eye out for large numbers of moths. If you are east of Rockland or in towns removed from the coast, and seeing numbers of moths, we encourage you to collect and submit samples to the lab (mailing address above). We know winter moth can be found along the southern coast and would like to know if it has spread inland. Also, we are looking for Bruce spanworm (*Operophtera bruceata*) outbreaks. This insect is native, closely related to the invasive winter moth and we would like to be able to study what keeps it under control.



Be on the lookout and report winter moth sightings. The moths will fly in November and December. East of Rockland and in from the coast, please collect and mail in samples. Image: Maine Forest Service

Diseases and Injuries

Drought stress has impacted trees in the southern half of Maine for much of this summer season, essentially a repeat of last year's very dry months of July and August. The drought has been especially tough on trees along the coast and on the islands, leading to dieback and mortality. As water is essential for all processes in trees, water deficit causes major problems and represents a very significant stress. This same stress in back-to-back growing seasons could potentially have negative short- and long-term impacts on tree health. Reduced vigor due to drought stress may lead to outbreaks of damaging forest pests, such as bark- and wood-boring beetles. Some trees may develop higher susceptibility to spider mite, aphid and scale infestation, further reducing tree vigor.

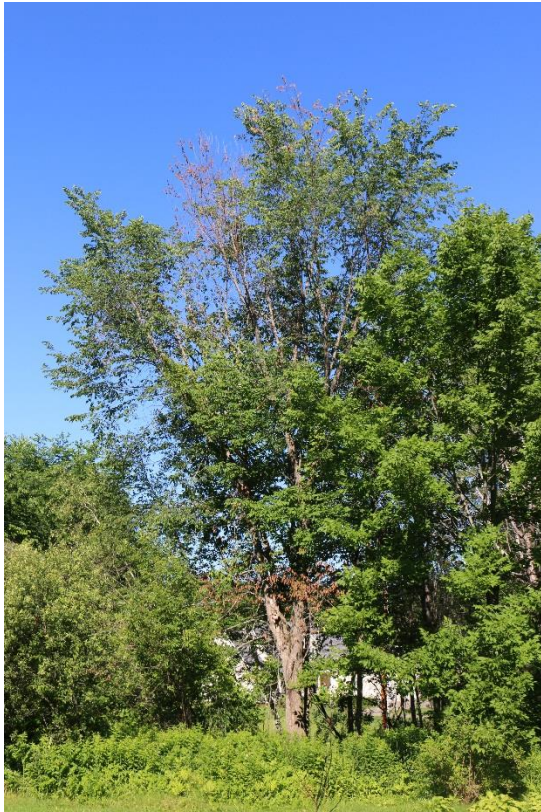
Trees may show a variety of symptoms following an extended period of drought stress, and the reaction can be species-specific. Some deciduous trees may drop their leaves and enter dormancy early, while coniferous trees may progressively drop their oldest needle classes – this may be noticed as fall needle drop occurring at an exaggerated level. Other general symptoms are wilting, marginal necrosis (dying tissue at the leaf margins), tip dieback of needles and a significant slow-down of later-season growth. Several tree species exhibit early fall coloration, which is why areas here and there on the landscape in Maine reached peak color very early this year.

While nothing can be done to alleviate drought stress for forest trees, trees growing in municipal/horticultural settings can be watered well into the fall to encourage regrowth of fine roots that often die due to drying out during times of severe water-deficit. Looking forward, keep a close eye on trees next season for early detection of fungal and/or insect attack in order to apply rapid management for these, in this case, secondary tree pests.

Dutch elm disease (DED) is a perennial issue and was evident throughout central and southern Maine as symptoms developed in mid-summer 2017. During a recent trip to northern Maine, DED was also noticed in a few locations. Overall, the level of disease is judged to be at a moderate level in younger elms in mixed forest and roadside stands. Landowner requests for assistance have been up slightly from

previous years, but the anecdotal information from field staff and land managers has indicated that, from a statewide perspective, DED levels are about normal this year.

Occurrence of DED on the landscape tends to patchy. Some areas can develop high disease levels with large-scale mortality over a short time period, while some areas remain disease-free for an indeterminate amount of time. The scale of infected areas and rate of expansion vary depending on the living elm population and if any management practices are followed as elm trees die. If infected trees are cut down



An elm tree in Manchester, Maine infected with DED and scheduled for removal this autumn. Image: Maine Forest Service.

the year they show symptoms and burned or debarked or buried, the rate of spread is greatly reduced. Where infected trees are left standing, they will become infested with elm bark beetles. These beetles will become contaminated with spores of the DED fungus as they emerge in spring and infect nearby healthy elms. This year, the Maine Forest Service forest pathologist visited several areas with high levels of mortality, even of large, stately American elm trees that have survived the various past waves of DED. Losing these trees from our landscape is disheartening. Early detection and proper management are key to preserving Maine's large elm trees for as long as possible.

The DED complex is expected to persist in the native range of American elm for years to come. This is due to the tendency of young elm trees to be resistant to the fungus. This resistance seems to be lost after the tree reaches seed-bearing age. Trees are often able to produce seeds for at least a few years before they become diseased, giving rise to a new cohort of elm trees. So, with the constant presence of the host, the disease and its bark beetle vectors, mortality of elm trees due to the Dutch elm disease complex is expected to continue where elm trees

grow. While there are chemical injections that, when applied correctly, provide protection from DED infection, this is a long-term and expensive commitment usually reserved for the highest-value specimen trees.

Tar spot of maple, caused by the native fungus, *Rhytisma acerinum*, is especially prevalent in several parts of Maine this year. *R. acerinum* especially affects the non-native Norway maples, including cultivars of Norway maple in horticultural settings, such as the burgundy-leaved Crimson King maple. There are three species of fungi in the genus *Rhytisma* that produce a tar spot symptom on our native maples, but these are encountered less frequently and cause minor damage.

The fungi that cause tar spot survive the winter in fallen leaves and produce and disseminate spores during prolonged periods of wet weather in spring. This year, May and June were particularly wet in many parts of Maine, leading to high disease incidence and severity in late summer. Collecting and disposing leaves is the recommended management strategy. If composting the collected leaves on-site, the leaf piles should be covered with a layer of soil, a dense layer of grass clippings or other compost. This will prevent the fungus from dispersing spores to re-infect maples the following spring. Leaves can

also be burned when and where this is permitted. While fungicides are available and effective, chemical management of tar spot is rarely required or practical.

In a forest environment tar spot diseases rarely reach high levels of severity, since severely affected leaves are prematurely shed by the tree, which can prevent complete development of spore-producing structures. Also, leaves dropped prematurely are largely covered up by layers of leaves of other forest trees during normal fall leaf drop, blocking spring spore dispersal.



By mid- to late summer, black fungal spots develop, which are the spore-producing structures of the fungus. Leaves with multiple infections eventually turn brown, and drop prematurely from the tree. *Image: Maine Forest Service.*

The tar spot diseases primarily represent an aesthetic issue to ornamentals and have little detrimental effect on the long-term health of affected trees. Infected leaves retain most of their photosynthetic capabilities throughout most of the

growing season and buds for next year's growth are already set by the time the black spots form. Leaf drop is late enough in the season so that a re-foliation by the tree is not usually triggered. This means that the energy reserves already stored will be preserved and sufficient to compensate for any damage, allowing the tree to develop normally next spring.

Tip dieback of red oaks (*Botryosphaeria* sp.) – Branch tip dieback of red oaks has been observed in several locations in Maine in recent weeks. The typically observed symptoms include a random pattern



Typical tip dieback symptoms commonly seen in oaks across Maine (arrow). *Image: Maine Forest Service.*

of dead branch tips with wilted orange to brown leaves. This can be mistaken for oak twig pruner damage, however tips of fine branches are not hollowed out, but are blackened and appear scorched. Oblong cankers may be present on symptomatic twigs further back on the blighted twig. This condition is often worse on trees that have experienced some kind of stress, weakening trees enough for the fungus to cause symptoms.

Office hours are 7:30 a.m. to 4:00 p.m., Monday through Friday, except for holidays. If you plan to visit either office, you may wish to call ahead just to make sure someone will be present to meet with you. (207) 287-2431 (Augusta) and 827-1813 (Old Town)

Calendar of Division and Related Events

Browntail Moth Forums

- **November 9** Falmouth, 6 pm, location to be announced
- **November 30** Camden Public Library, 7 pm

Invasive Forest Pest Displays: Maine Soil & Water Conservation Districts, under a grant from the Invasive Forest Pest Outreach Project of the Department of Agriculture, Conservation and Forestry, will have invasive forest pest displays at the following upcoming events:

- **October 14** A Day in the Woods at Hidden Valley Nature Center in Jefferson (Lincoln County)
- **November 11** Craig Brook Fish Hatchery Spawning Festival in East Orland (Hancock County); display & mini-presentations throughout the day
- **November 11 & 12** Maine Harvest Festival in Bangor (Penobscot County)

Conditions Report No. 5, 2017

On-line: http://maine.gov/dacf/mfs/publications/condition_reports.html

DEPARTMENT OF AGRICULTURE CONSERVATION & FORESTRY

Maine Forest Service - Forest Health and Monitoring

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