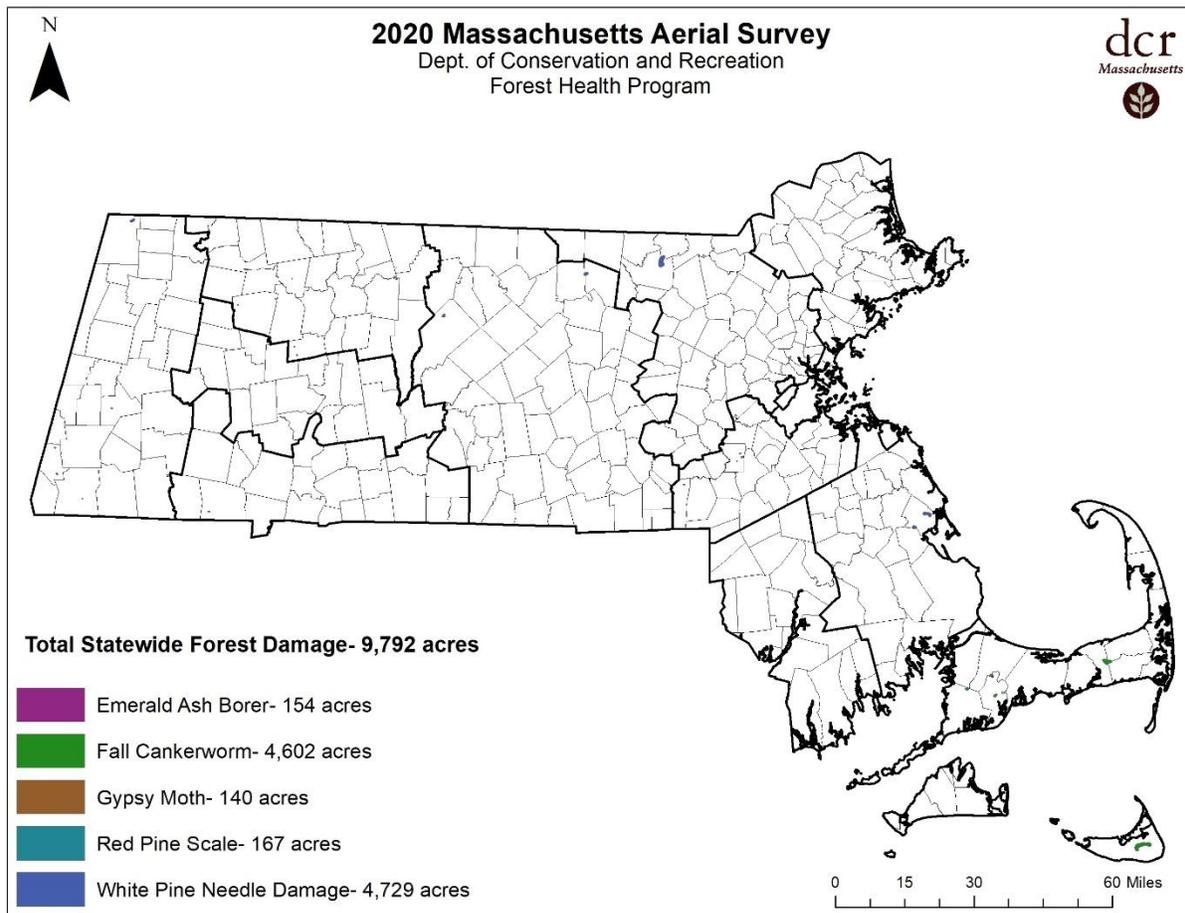


MASSACHUSETTS 2020 FOREST HEALTH HIGHLIGHTS



Caption: Results from the Massachusetts DCR Forest Health Program 2020 aerial survey efforts. A total of 9,792 acres of damage were identified through ForWarn II satellite disturbance detection and confirmed through ground surveys.

Aerial Survey

Due to Covid related restrictions, the DCR Forest Health Program was unable to complete our typical aerial survey flights. We used ForWarn II data to guide ground surveys to detect and quantify any forest damage events. Statewide, we documented 9,792 acres of forest damage through our survey efforts. This acreage included:

- 154 acres of white ash dieback caused by emerald ash borer (*Agrilus planipennis*).
- 4,602 acres of oak defoliation caused by fall cankerworm (*Alsophila pometaria*).
- 140 acres of oak defoliation caused by gypsy moth (*Lymantria dispar*).
- 167 acres of foliage discoloration caused by red pine scale (*Matsucoccus matsumarae*).
- 4,729 acres of crown discoloration in eastern white pine caused by white pine needle damage

Forest Pests and Diseases

Asian Longhorned Beetle

The DCR Forest Health Program continues to be the lead state agency in charge of the Asian Longhorned Beetle Eradication efforts in Worcester County. Only 1 infested tree was discovered in 2020. A single infested maple was found in Auburn, MA in January 2020, this was

the first ALB infested tree detected in this community. All known infested trees have been removed.

The DCR Forest Health Program deployed and monitored 225 ALB pheromone traps in the Worcester County infestation area. The traps were concentrated in the southern portion of the quarantine zone, near the ALB positive infested tree found in Auburn, MA in early 2020. Traps did not locate any ALB in 2020. However, trap catch included several cerambycid species, indicating the lure was attracting long horned beetles to the trap and the lure combination and timing was effective.

Beech Leaf Disease

Beech leaf disease was detected for the first time in Massachusetts in 2020. Infected American and European beech were found in Plymouth, MA- Plymouth County, in June 2020. An infected site was also confirmed in Dartmouth, MA- Bristol County. The DCR Forest Health Program will continue to survey and sample for the spread of this disease in the commonwealth.

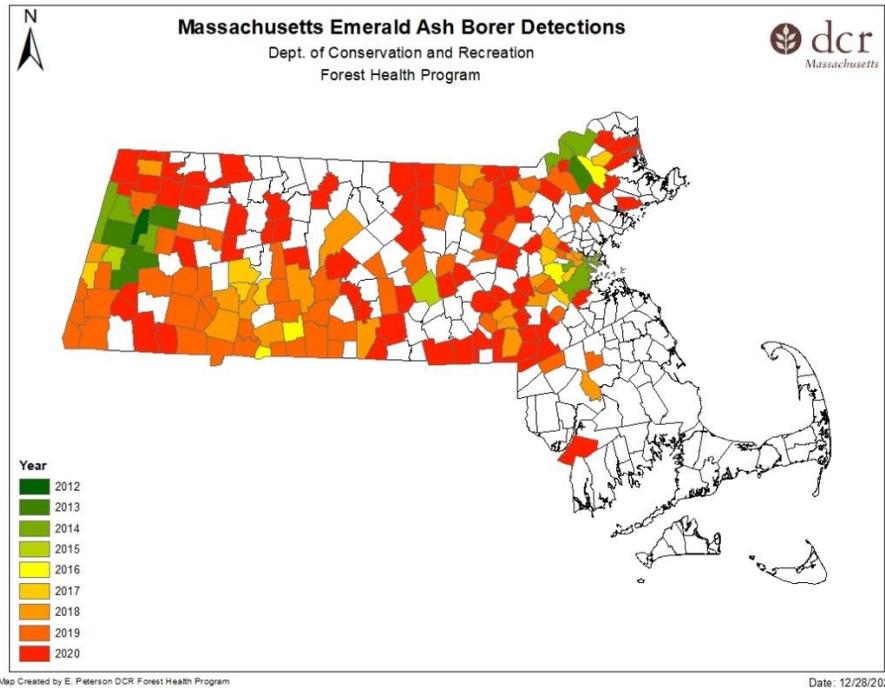


Caption. Beech leaf disease symptomatic American beech leaves- Plymouth, MA, June 2020.

Emerald Ash Borer

The DCR Forest Health Program performed visual windshield surveys to detect emerald ash borer (*Agrilus planipennis*; EAB) in new communities and areas. Surveys were performed in all mainland counties across the state. These surveys were focused in areas of close proximity to known populations or near likely transportation vectors during periods of leaf-off (January-March and November-December). In 2020, there were 70 new infested Massachusetts communities detected through windshield surveys and investigations of public reports. These finds included a new county detection; Charlemont, MA- Franklin County.

The Forest Health Program released EAB biocontrol species at 11 sites in 2020, this included 3 new release sites and 8 supplemental 2nd and 3rd year release sites. These release sites were ecologically significant ash stands in Berkshire, Essex, Franklin, Hampshire, Middlesex, Plymouth, and Worcester Counties. Three parasitic species were released: *Oobius agrili*, *Tetrastichus planipennis*, and *Spathius galinae*.



Caption: The progression of communities in Massachusetts with positive emerald ash borer detections shown by the year of first detection. As of December 2020, 169 communities in Massachusetts, across 11 counties, have identified emerald ash borer infestations.

Hardwood Defoliators

In spring 2020, a fall cankerworm outbreak led to 4,602 acres of oak defoliation in coastal regions of southeast Massachusetts. The greatest feeding impact was in the oak shrub barrens in Nantucket County. This is the third year of severe defoliation caused by fall cankerworm on Nantucket.

Following a significant population reduction in 2019, the gypsy moth levels continued to remain low in 2020. Only 140 acres of oak defoliation attributed to gypsy moth was detected. Favorable spring conditions following hatch appear to allow high infection rates by *Entomophaga maimaiga*, leading to significant caterpillar mortality.

The DCR Forest Health Program received an increase in public reports of hardwood defoliators this year. Confirmed pests included fall webworm, forest tent caterpillar, maple saddle prominent, variable oakleaf caterpillar, and white satin moth. Most of the defoliators caused minimal impact and limited defoliation. However, the white satin moth outbreak caused a small pocket of total defoliation in Berkshire County.



Caption: White satin moth caterpillars during spring feeding. Monterey, MA, June 2020.

Hemlock Woolly Adelgid

Hemlock Woolly Adelgid (*Adelges tsugae*; HWA) population densities dramatically increased across the state in 2020 due to mild winter conditions in 2019-2020. The DCR Forest Health Program assessed hemlock woolly adelgid populations through winter and summer sisten mortality surveys. This year we observed levels of winter HWA mortality much lower than typical for the region, there was an average HWA winter mortality rate of 40% across sites surveyed in early 2020. Summer HWA mortality was slightly above typical for the state, there was an average HWA summer mortality rate of 45% across all sites surveyed in fall 2020 following aestivation break.

Hemlock stand decline and mortality is observed in the highest rates in stands with HWA and an additional stressor; elongate hemlock scale has become prevalent in hemlocks statewide and fungal pathogens such as sirococcus tip blight are common under favorable condition.

In November 2020, the DCR Forest Health Program released 400 *Laricobius nigrinus*, HWA biocontrol predator beetles, at Federated Women's Club State Forest- Petersham, MA. Additionally, the Forest Health Program continues to monitor for *Sasajiscymnus tsugae* and *Laricobius nigrinus* at historic predator release sites throughout the state; no predators were recovered in 2020.

Targeted pesticide treatments were implemented by the Forest Health Program in ecologically and culturally significant eastern hemlock stands on state forests to reduce infestation levels of hemlock woolly adelgid and elongate hemlock scale. In June 2020, 99 hemlocks at Blue Hills State Reservation, 50 hemlocks at Hemlock Gorge State Reservation, 79 hemlocks at Mt Tom State Reservation, and 80 hemlocks at Wachusett Mountain State Reservation were treated with a basal bark spray application of dinotefuran. Health metrics and pest population density values were collected in treated and untreated control trees at the end of the growing season to assess the impact of treatments on overall hemlock health.



Caption: DCR Forest Health Specialist surveying for HWA biocontrol beetles, *Laricobius nigrinus*. Lincoln, MA, November 2020.

Red Pine Scale

Statewide, the Forest Health Program continues to observe the spread of red pine scale (*Matsucoccus matsumarae*). Large areas of mortality and rapid defoliation are being mapped annually; a total of 167 acres of red pine scale damage was detected in 2020.

Southern Pine Beetle

The DCR Forest Health Program was unable to trap for the presence of southern pine beetle (SPB) in pitch pine stands during the 2020 field season. Program staff completed ground surveys in high priority areas to identify any possible suspicious damage in pitch pine stands; no damage attributed to southern pine beetle was discovered. To date, no southern pine beetle infested trees have been found in Massachusetts. We will continue to monitor for the presence of this destructive forest pest.

White Pine Needle Damage

Eastern white pine needle damage diseases continue to cause a significant impact and noticeable spring needle loss throughout the commonwealth. Eastern white pines in all counties of the state suffer from crown discoloration, thinning canopies, and general decline caused by the stress of the fungal needle pathogens. In 2020, approximately 4,729 acres of white pine stands with white pine needle damage was documented.

Other Projects

The DCR Forest Health Program continued to supply the USDA- APHIS Otis Methods Lab with wood for the rearing and research of Asian longhorned beetle, emerald ash borer, and spotted lantern fly.

Utilizing a U.S. Forest Health Landscape Scale Restoration grant, the DCR Forest Health Program developed a series of forest pest outreach webinars. The goal of these events was to

train community environmental leaders, green industry professionals, and citizen scientists on identifying common forest health threats and potential future concerns.