

Massachusetts Forest Health Highlights 2024

Dept. of Conservation and Recreation
Forest Health Program
November 2024

Aerial Survey Results

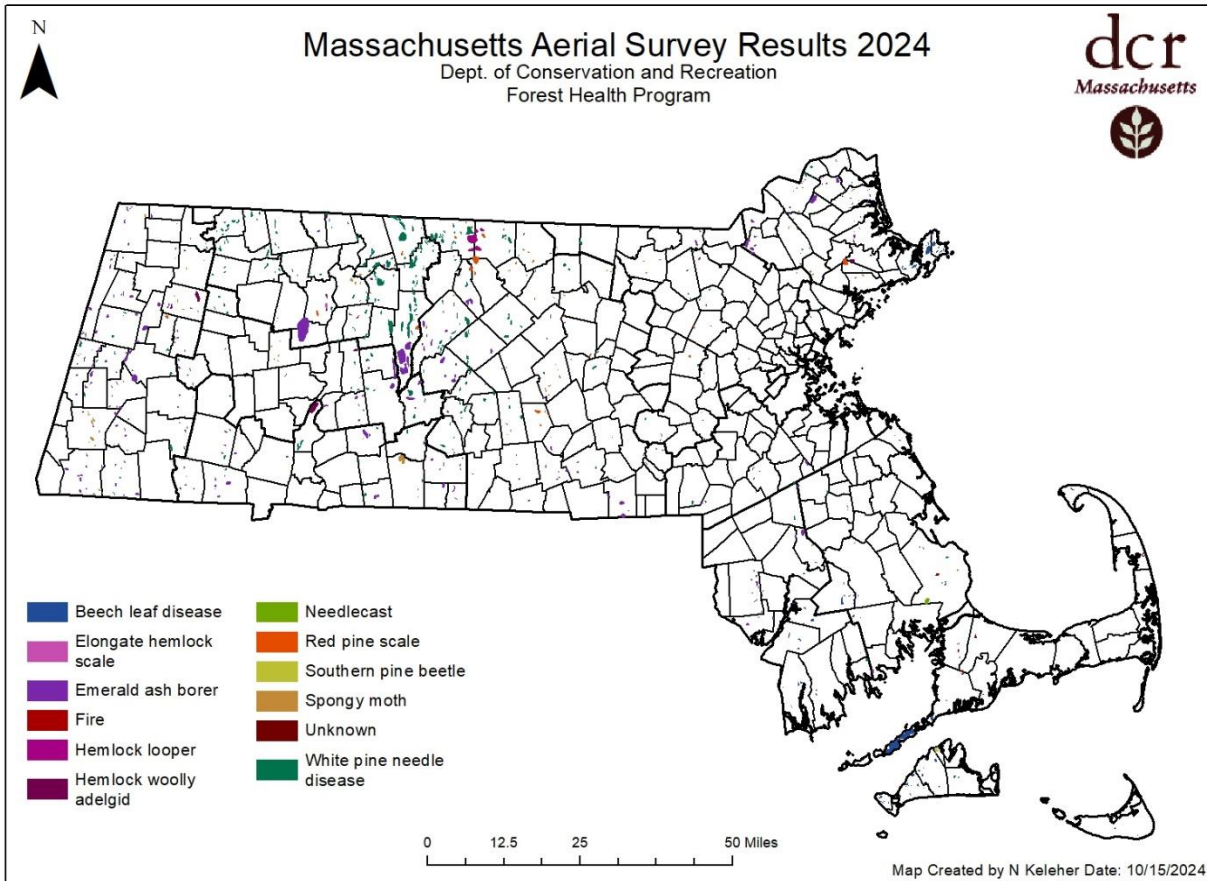


Figure 1. DCR Forest Health Program aerial survey results 2024.

80,181 acres of forest damage documented statewide from the annual aerial survey

- 29,765 acres of white pine needle damage
- 29,551 acres of emerald ash borer caused decline and mortality
- 7,418 acres of beech leaf disease defoliation
- 5,020 acres of red pine scale decline and mortality
- 2,379 acres of impact from hemlock woolly adelgid
- 2,352 acres of hemlock looper caused mortality
- 1,747 acres of spongy moth impact

Elm Zigzag Sawfly

Elm zigzag sawfly (*Aproceros leucopoda*) was detected in Massachusetts for the first time in August 2023, it has since been confirmed in 26 communities in Berkshire, Franklin, Hampden, Hampshire, and Worcester Counties. Detections have come from confirmation of public reports and visual surveys performed by Forest Health Program staff.

At this time, there is still uncertainty on the population trends of this invader and what the long-term impact to our elm resources will be. From anecdotal observations at several western Massachusetts infestation sites, it seems spring adult emergence is aligned with elm leaf break and that there were typically three generations during the spring and summer months. However, enhanced surveys in spring 2025 are required to fully understand the extent of establishment and population dynamics.



Figure 2. Adult elm zigzag sawfly on newly emerged elm leaves. Becket, MA; May 2024.

Beech Leaf Disease

Beech leaf disease (BLD) was first found in Massachusetts in 2020 in Plymouth, MA. Since that time, BLD has been confirmed in all Massachusetts counties. BLD has been detected in 139 new communities in 2024, for a total of 339 communities with confirmed infections across the Commonwealth. Infected communities have been detected through ground surveys performed by DCR Forest Health staff and confirmation of public reports. We have received 935 public reports through our Survey123 reporting form, with additional reports, questions, and requests for information by phone and email.

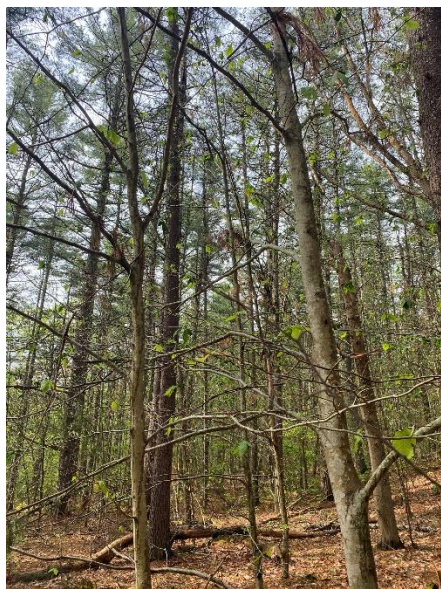


Figure 3. BLD infected defoliated American beech stand. Plymouth, MA; June 2024.

Beech leaf disease in Massachusetts has been observed in American beech and European beech trees and is affecting both our forested and urban trees. Symptoms have been seen in trees of all size classes, from seedlings to large mature trees. The disease has rapidly progressed and stands throughout Eastern Massachusetts are already experiencing notable decline. Over 7,400 acres of severe BLD damage were mapped during aerial survey efforts this year. This is a significant underrepresentation of the impact, many of our forested beech stands are mid and understory trees that are not captured from visual aerial surveys. Ground observations identified many locations with high percentages of defoliation and aborted buds.

The DCR Forest Health Program participates in a regional BLD monitoring effort. Permanent monitoring plots were established in 2021 and have been reassessed annually. Monitoring plot surveys were completed at 11 sites across the Commonwealth in June 2024. At each site, foresters collected data on site composition, tree health metrics, and severity of BLD leaf symptoms. Results from these efforts are helping to provide us with more information about how beech leaf disease progresses in

our forests, the impact it will have on our beech resources, and potential long-term changes to forest structure.

Table 1. BLD Monitoring plot sites 2024.

Site	Town	County	Initial Status (2021)	Current Status (2024)
Destruction Brook Conservation Area	Dartmouth	Bristol	Infected	Infected
Bradley Palmer State Park	Topsfield	Essex	Infected	Infected
Erving State Forest	Erving	Franklin	Uninfected	Infected
Tolland State Park	Tolland	Hampden	Uninfected	Infected
DAR State Forest	Goshen	Hampshire	Uninfected	Infected
Holyoke Range State Park	Amherst	Hampshire	Uninfected	Infected
Middlesex Fells State Reservation	Medford	Middlesex	Uninfected	Infected
Blue Hills State Reservation	Quincy	Norfolk	Infected	Infected
Morton Town Park	Plymouth	Plymouth	Infected	Infected
Boynton Town Park	Paxton	Worcester	Infected	Infected
York Lake State Forest	Sandisfield	Berkshire	Infected	Infected

Emerald Ash Borer (Agrilus planipennis)

Emerald ash borer (EAB) is present in nearly all ash resources in Massachusetts. EAB was detected in 3 new communities this year. At this time, EAB has been detected in all 14 Massachusetts Counties and in 280 communities. The EAB population density is high through all impacted counties, and each year we are seeing more and more ash succumbing. Approximately 29,551 acres of ash mortality and dieback were mapped during the annual aerial survey. But this is just a fraction of the impact across our landscape. This method only captures a small glimpse of ash mortality due to the limitations of aerial survey to detect the low percent ash component common in many areas of Massachusetts. The removal of declining ash continues to pose a public safety risk and financial burden for many communities and landowners.

The Forest Health Program has taken a step back from active EAB detection surveys. New community detections are driven by public reports that are investigated and confirmed by Forest Health Program staff. Areas without confirmed EAB populations at this time are typically locations that have limited ash trees present, most of these communities have forest types where ash is not a common component of the ecosystem.

In 2023, the Forest Health Program began a targeted pesticide treatment project aimed at protecting old growth ash. We continued treatments this year, 24 white ash trees were injected at Mohawk Trail State Forest. Trees were injected with an emamectin benzoate based product (Treeage G4). We will continue to monitor and assess ash stands with the potential of expanding treatments to other significant old growth stands. All treated trees are assessed for initial condition, geolocated, numbered, and tagged.



Figure 4. Ash mortality observed during aerial survey operations. Boxford, MA; June 2024.

Spongy Moth (Lymantria dispar)

Spongy moth populations continued their downward trend in 2024, however, there was still low levels of detectable defoliation in Western Massachusetts. Small, isolated pockets of defoliation were observed in Berkshire, Franklin, and Hampden Counties. Statewide, only 1,747 acres of defoliation were mapped during aerial survey efforts. Historically, spongy moth outbreaks in Western Massachusetts have been less damaging than the impact of the pest in the areas east of the Connecticut River. However, a changing climate may alter the population dynamics in our forests. In recent years, spring temperature fluctuations and precipitation patterns have greatly influenced caterpillar survival rates and defoliation impact.

The Forest Health Program is working on completing an extensive spongy moth egg mass survey to identify areas at risk of defoliation in 2025. Winter egg mass surveys are used to assess reproductive success and potential population densities next spring. Foresters will survey randomized sampling points in locations with either detected defoliation in the last three years or historic high-risk areas that have frequently experienced outbreak reoccurrence. Results from the egg mass survey are expected to be ready in February 2025. We anticipate low risk levels statewide in 2025.

Hemlock Woolly Adelgid (Adelges tsugae) and other Hemlock Pests

Hemlock woolly adelgid (HWA) is a persistent pest to eastern hemlocks statewide. HWA has been identified in all Massachusetts counties and in all communities with significant hemlock resources. However, the population has greatly fluctuated over the last three decades. HWA is vulnerable to the harsh winter conditions in New England. Population densities crash during cold winters or years with extreme temperature changes and build in mild or warm winters.

The DCR Forest Health Program tracks HWA population densities across the state and monitors population trends through winter and summer sisten generation mortality surveys. Mild winters in recent years has allowed HWA populations to flourish across the state. There was an average HWA winter mortality rate of 19% across 14 sites surveyed in late February 2024. This rate is lowest we have observed since beginning these surveys in 2017. Summer mortality rate data for 2024 was not ready when this report was written.

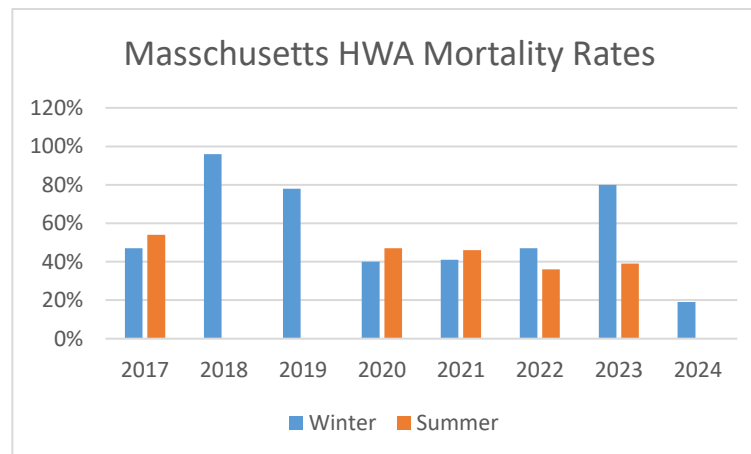


Figure 5. HWA sistens summer and winter average mortality rates in Massachusetts 2017-2024.

In addition to HWA, hemlocks in Massachusetts are commonly impacted by the invasive pest elongate hemlock scale (*Fiorinia externa*; EHS). EHS has become prevalent in hemlocks statewide and is causing widespread needle damage. HWA stress on trees fluctuates with the highly climate influenced

pest populations and provides the trees periods of recovery in low HWA density years. However, EHS stress appears to be more persistent year after year once a stand becomes infested. In 2024, 226 acres of hemlock decline was attributed to elongate hemlock scale. However, hemlock stand decline and mortality is observed in the highest rates in stands with HWA and an additional stressor, such as EHS, fungal pathogens, or drought.

A targeted pesticide treatment program is 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. Treatments occur at 13 sites across the state on a 3-year rotating schedule. In 2024, a total of 586 trees were treated at five DCR State Forests. Hemlocks at Bash Bish State Park, Chester-Blandford State Forest, Maudslay State Park, Middlesex Fells State Reservation, and Mohawk Trail State Reservation were treated with dinotefuran this May. Two application methods were used; the majority being treated with a basal bark spray (Transtect 70WSP applied at rate of 6 oz product / gallon of solution), while hemlock trees close to water resources were treated with direct trunk injections (Dinocide applied at a rate of 2 oz product / inch of DBH). All treatments were completed by a contractor selected through the competitive bid process. All treated trees are geolocated, numbered, and tagged.

Table 2. Summary of hemlock treatments performed by DCR Forest Health Program in 2024.

Site	DBH	Trees	Area
Bash Bish State Park	2,805 inches	139 trees	7.0 acres
Chester-Blandford State Forest	1,080 inches	58 trees	2.5 acres
Maudslay State Park	2,935 inches	122 trees	3.5 acres
Middlesex Fells State Reservation	1,751 inches	84 trees	3.1 acres
Mohawk Trail State Reservation	3,135 inches	183 trees	12.0 acres
2023 Total	11,707 inches	586 trees	28.1 acres

Tree growth, health metrics, and pest population density values are also collected by Forest Health staff in a subset of treated hemlocks and untreated control trees. This survey is completed at the end of the growing season each year, after HWA sisten generation break aestivation, at all sites that have been treated in the last three years. The survey results allow us to assess and quantify the beneficial impact of treatments on overall hemlock health.

Biocontrol beetle species *Laricobius osakensis* was released at two sites in Massachusetts in 2024. In October, 500 adult beetles were releases at Rutland State Park and 500 were released at DAR State Forest. These were both new biocontrol release sites. Additional releases are planned for November 2024 as beetles are available. At the time of this report, recovery surveys are underway at previous biocontrol release sites to assess *L. osakensis* and *L. nigrinus* establishment.

Southern Pine Beetle (Dendroctonus frontalis)

Southern pine beetle (SPB) populations in Massachusetts reached critical levels in 2023 and active outbreak infestations persisted in Massachusetts in 2024. Concern about the expanding range of SPB and long-term impact to our pine forests has increased with the looming threats of climate change. Devastating SPB outbreak levels in New York state in 2014 prompted New England states to begin monitoring efforts to enhance early detection and response capabilities. SPB has been detected across Massachusetts through trapping surveys since 2015. However, SPB was not found actively infesting trees until 2022. Two pitch pine with low level infestations were found adjacent to a trap site in Mashpee in June 2022. And SPB did not reach infestation levels causing tree mortality until 2023 when multiple outbreaks were detected on Nantucket and Marthas Vineyard Islands.

Aggressive suppression actions were taken by multiple affected landowners in 2023. However, the infestations pockets on Martha's Vineyard Island continued to expand and new hot spots developed this year. Drop and leave suppression cuts were performed by DCR Forest Health Program staff in September 2023 with additional follow-up cuts in May 2024 in an effort to stop the mortality occurring Manuel Correllus State Forest (Vineyard Haven, MA). But the infestation continued to spread within the stand despite the rapid actions. Ground surveys in July 2024 identified approximately 20 actively infested trees, follow up surveys in September showed this spot expanded to over 400 trees.



Figure 6. Pitch pine mortality caused by SPB. Vineyard Haven, MA; September 2024.

Monitoring and surveys are more important now than ever to help track the population trends, early identification of infested trees, and provide guidance to resource managers. The DCR Forest Health Program deployed SPB traps at 21 sites in spring and fall 2024 for detection sampling. The survey utilized black 12-funnel Lindgren survey traps with wet collection. The traps were baited with frontalin lure, alpha pinene lure, and endo-brevicomin lure. For spring sampling, traps were set in April and removed in late June. Fall traps were to be set from September to early November, however traps were removed early at most sites due to high beetle catch and concern about inciting an outbreak. Processing of fall samples is not yet complete. But spring results reflected our survey observations over the last 3 years, an increased number of beetles caught at a greater number of sites. SPB were detected at 18 of the 21 sites, those sites with no SPB found were all interior pitch pine stands with active management.

Visual ground transect surveys are planned for fall and winter 2025 around high catch trap sites and other high risk locations. Additional aerial surveys are planned for late fall to help identify any newly infested sites. Continuing to be proactive is critical in protecting our pitch pine resources from SPB. Enhanced monitoring, development of response plans and management plans, and the ability to take swift action will help reduce tree loss. Additionally, catching outbreaks early and acting quickly can minimize the cost associated with disrupting outbreak events.



Figure 7. DCR Forest Health Program performing SPB suppression cuts. Vineyard

Table 3. Summary of SPB trapping survey results 2015-2024.

Year	Sampling Period	Positive Sites	SPB Total
2015	Spring	18	-
2016	Spring	5	7
2017	Spring	1	1
2018	Spring	4	4
2019	Spring	1	2
2022	Spring	19	323
2023	Spring	17	479
2023	Fall	14	745
2024	Spring	18	1,770

Red Pine Scale (*Matsucoccus matsumarae*)

Statewide, red pine scale continues to cause decline and mortality of red pine stands. Large areas of mortality and crown discoloration in red pine plantations are being mapped annually; a total of 5,020 acres of red pine scale damage was detected in 2024. All counties with substantial red pine stands are impacted by this insect.

Due to most red pine resources being plantation style stands that have received minimal management, many red pine stands also exhibit symptoms of needle and root fungal pathogens that create a severe decline complex. Forest health staff collect foliage samples and analyze red pine scale densities when requested by DCR foresters, park staff, or other resource managers.

White pine decline

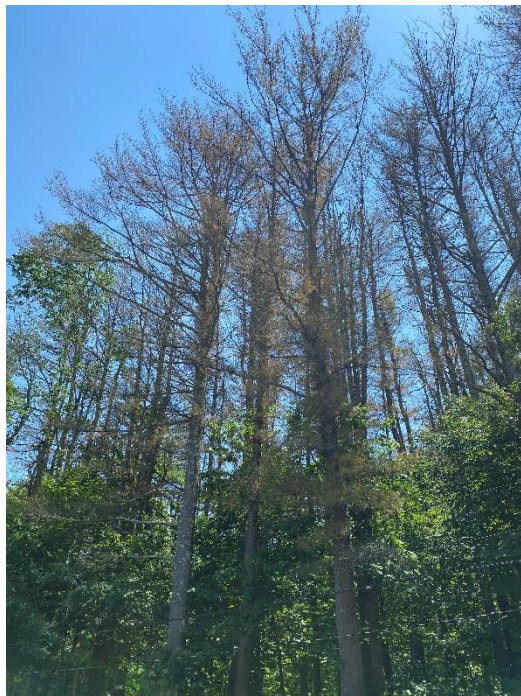


Figure 14. White pine symptomatic for white pine needle disease. Quabbin Reservoir, Ware, MA; May 2024.

Eastern white pine needle disease continues to cause a significant impact across our landscape in Massachusetts. The high infection rates of fungal needle pathogens have become common in our white pine stands over the last decade. Each year stands of white pines in all counties are observed to have some level of crown discoloration, thinning canopies, and general decline caused by the stress of the fungal needle pathogens.

This year, white pines were particularly hard hit by the disease complex; symptoms were widespread and severe. Needles turned brown and quickly dropped during the last week of May into early June. Anecdotally, it appeared a higher percentage of white pines were symptomatic, and the severity of the infections were much higher than typical years. Numerous public reports were received from individuals concerned about the long-term impact to their trees. Thankfully, most trees were able to successfully push out new growth and survive the growing season. It is unknown if this stress event could lead to an uptick in future decline and tree mortality. Approximately 29,765 acres of white pine stands with white pine needle damage was documented during our aerial survey. However, this is a dramatic underrepresentation as most discolored needles had dropped before the aerial survey flight dates.

DCR Forest Health staff have identified areas where the persistent stress of the needle cast disease has led to tree decline and eventual mortality. White pines have become more vulnerable to decline caused by other stressors, including attack by native pests and pathogens that are typically of minor concern. These instances of white pine mortality have mostly been isolated to individual trees on taxing sites (e.g. along roadways, disturbed/ construction areas, soils more vulnerable to drought/ extreme rain events), but we are beginning to observe larger pockets of mortality in historically suitable white pine sites.

Asian Longhorned Beetle (*Anoplophora glabripennis*)

The DCR Forest Health Program continues to work in cooperation with USDA APHIS on Asian Longhorned Beetle Eradication efforts in Worcester County. The 110 sq mile quarantine area enforcement remains in all of Worcester, West Boylston, Boylston, and Shrewsbury, and portions of

Holden and Auburn. Collaborative DCR and USDA teams complete ground and climbing visual inspection progressive surveys. No infested trees have been found in 2024.

The Asian Longhorned Beetle (ALB) trapping program placed 50 black flight interception traps with wet collection in 2024. Survey strategy was focused on placing traps in model derived high-risk infestation areas and areas of regulatory concern for host material movement. Traps were placed within the ALB Regulatory area. All traps were baited with lures that consisted of Z-3-Hexenol, Linalool, Trans-Caryophyllene, 4-(n-Heptyloxy) Butanol, 4-(n-Heptyloxy) Butanal. No ALB were found in any of the 2024 traps.

Outreach and Education

Outreach efforts are a major component of the DCR Forest Health Program. We understand the value and important role of outreach in making significant strides against invasive species and forest health threats. Our program reached a wide, diverse public audience in 2024. The Forest Health Program hosted a series of 6 field-based workshops. These walk-and-talk style events allowed the public to have a hands-on learning experience and see insects and disease damage up close. Our team also gave over 15 forest health presentations, directly reaching over 1,200 individuals. Additionally, program staff gave 9 press interviews to a wide range of media outlets including print news, online resources, radio stations, and live televised segments. We continue to produce educational materials, infestation maps, pest alerts, and maintain our online resources. Our Forest Health Storymaps were viewed by 2,900 individuals in 2024.