MAINE FOREST SERVICE
FOREST HEALTH AND MONITORING

FOREST HEALTH HIGHLIGHTS

ANNUAL REPORT
2025

MAINE DEPARTMENT OF AGRICULTURE CONSERVATION & FORESTRY

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2025 Maine Forest Health Highlights

Report to the USDA Forest Service
November 17, 2025

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https://www.maine.gov/dacf/mfs/publications/condition_reports.html

Contents

CLIMATE SUMMARY

The Maine Climate Office (MCO) and Northeast Regional Climate Center (NRCC) provide detailed summaries of climate variables such as temperature and precipitation.

Since 1997, Maine's annual average temperatures have remained above average each year, and the annual average temperature for 2025 is expected to continue this trend. At the beginning of 2025, the winter and spring season across Maine averaged about 2.8°F warmer than normal compared to historic temperatures recorded from 1901-2000 (NRCC). Statewide, the average summer temperature was also about 2.2°F warmer than normal, and autumn temperatures are expected to be above normal.

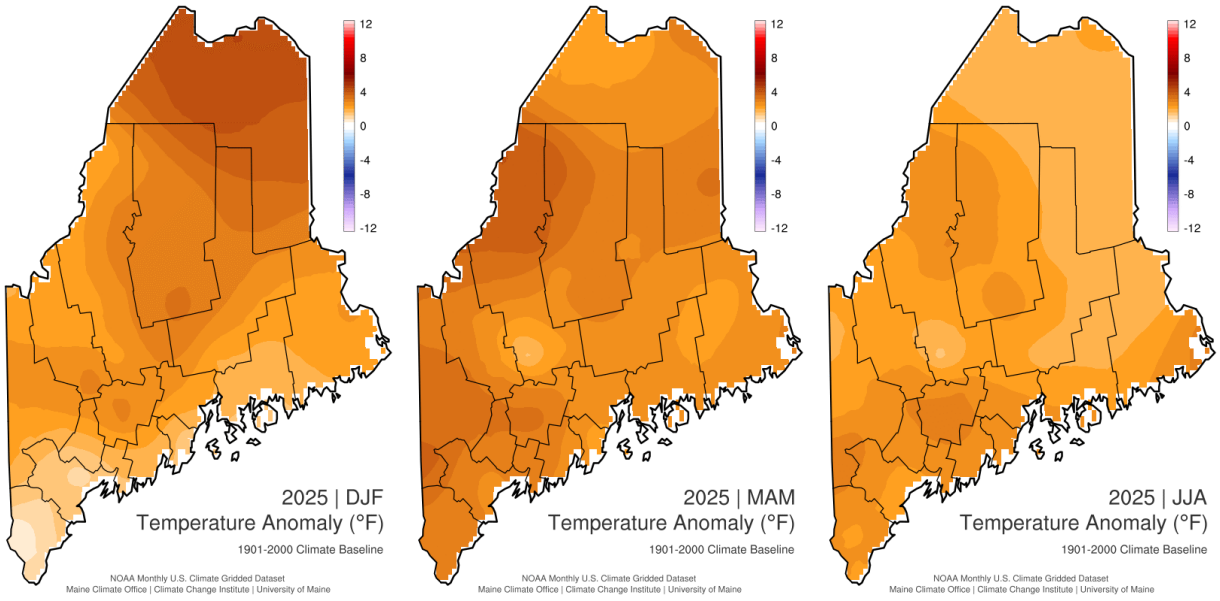

Figure: (left to right) 2025 statewide temperature anomaly maps for winter (December – February), spring (March – May), and summer (June – August). (Maine Climate Office)

The southern portion of the state began to see a deficit in average precipitation totals during the winter season, with some relief from sufficient rain events in early spring. By August, however, a flash drought in the southern two-thirds of the state marked the beginning of an ongoing drought that was heightened by continuous hot and dry weather conditions. The drought conditions steadily worsened through autumn and by the end of October, every county in the state had some area experiencing moderate drought conditions (D1), with most of the state (92.7 percent) experiencing severe drought conditions (D2) according to the U.S. Drought Monitor. Additionally, nine counties in southern and central Maine continue to have areas with extreme drought conditions (D3) and record-breaking low water levels. Current drought trends are expected to persist into the 2026 winter season, as roughly 150 percent of normal rainfall totals would be needed before winter to end the current drought conditions for the most impacted areas (U.S. National Weather Service).

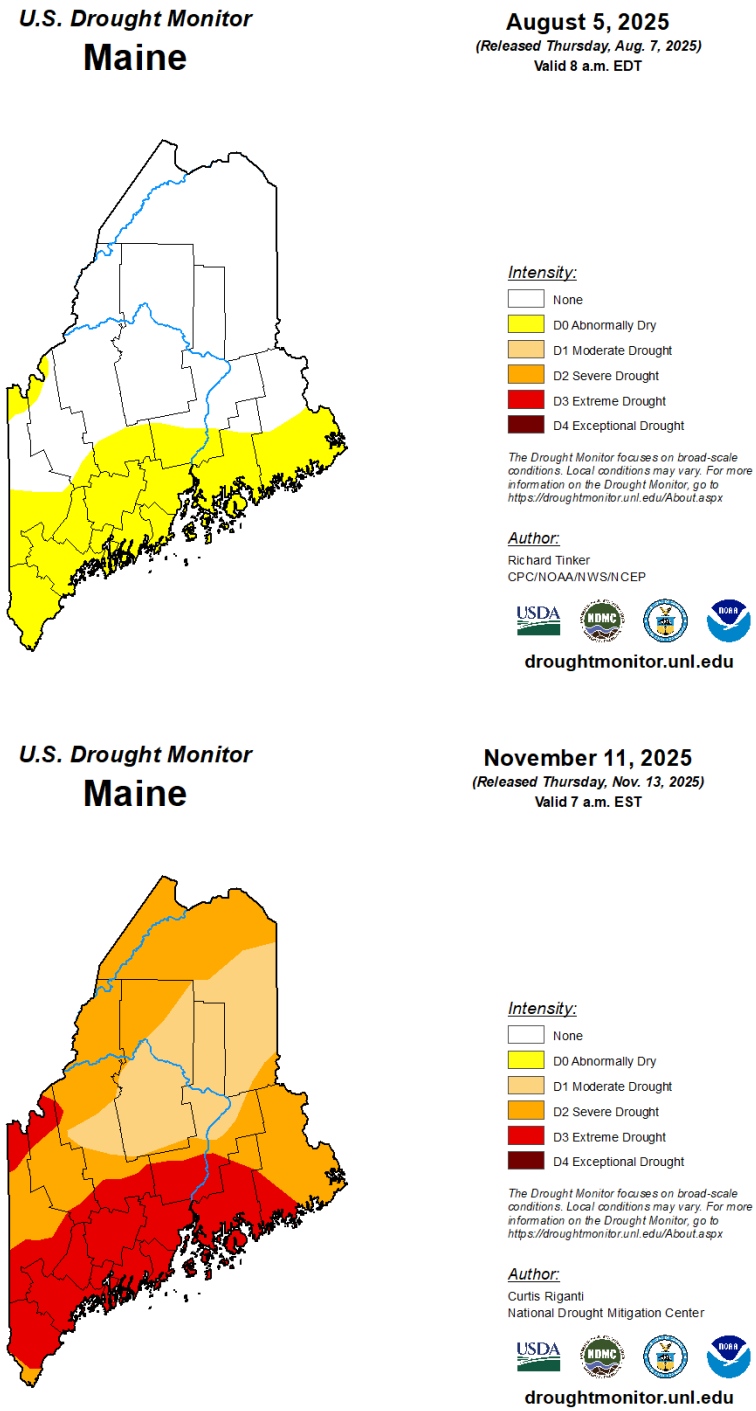

Figure: Progression of 2025 drought conditions in Maine from flash drought conditions beginning in August (above) through October (below). (U.S. Drought Monitor)

Maine Climate Office (MCO), Accessed November 17, 2025, https://mco.umaine.edu/climate
U.S. Drought Monitor, Accessed November 17, 2025, https://droughtmonitor.unl.edu

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FOREST RESOURCE SUMMARY (2019 – 2024)

With an estimated 17.42 million acres of forest land covering 88 percent of the land area, Maine continues to boast the highest percentage of forest cover of any state. As part of the United States Department of Agriculture Forest Service (USFS), Forest Inventory and Analysis (FIA) program, Maine monitors its forests using roughly 3,500 sample plots. Data is collected on a rotating schedule from approximately 20 percent of these plots each year. The summary statistics presented here for the preceding years have been generated using FIA data accessed on September 29, 2025.

Over the past five years, forest land area has decreased slightly from 17.52 million acres in 2019 to 17.42 million acres in 2024. Likewise, the number of live trees on forest land decreased slightly during that period from 23.41 billion trees to 22.30 billion trees. Volume of trees on forest land, accounting for all live trees greater than 5.0 inches DBH, increased from 35.94 billion cubic feet to 38.0 billion cubic feet. Total forest land carbon storage increased from 1.57 billion metric tons to 1.6 billion metric tons.

Management activities were performed on 3.4 percent of forested lands, and 50.4 percent of management activities on these lands were cuttings. Insect and disease issues disturbed 1.5 and 2.0 percent of forest lands, respectively, amounting to a combined area of 622,373 acres. Despite removals, mortality, and insect and disease issues, Maine's forests experienced net growth during this time, amounting to an estimated 285 million cubic feet.

Land ownership by broad owner type has remained relatively constant in Maine. An estimated 92 percent of the land base is privately owned, state and local governments own 7 percent, and 2 percent is federally owned.

Adapted from USDA Forest Service. 2025. Forests of Maine, 2024 FIA Annual Snapshot. Resource Update FS-659. Washington, DC: U.S. Department of Agriculture, Forest Service. 4 p. https://doi.org/10.2737/FS-RU-659. The estimates presented are based on data retrieved from the FIA database (03/01/2023) and may not reflect the most recent data available from the FIA program. Note – this publication does not include estimates of uncertainty. Average annual estimates are based on data collected across 5-10 years and may not be indicative of the nominal year presented in the title itself.

AERIAL SURVEY SUMMARY

The core aerial survey season wrapped up in early August; however, two additional late-season flights were added prior to leaf drop to capture drought damage as it continued to develop into the fall, amounting to approximately 30,384 acres. Unlike 2024 and much like 2023, our 2025 aerial survey season was hampered by chronic Canadian wildfire smoke, although we were still able to accomplish what needed to get done. Like 2024, perhaps the most widespread issue in 2025 was white pine needle disease, truly spanning the entire state wherever white pine is found. We mapped 20,526 acres, but aerial surveys alone cannot hope to capture the magnitude of this damage on the landscape. In southern Maine, emerald ash borer damage finally reached a level in York and Cumberland counties where several pockets of dead ash are now visible from the air, amounting to 113 acres. Following the collapse of the spongy moth outbreak that affected southern Oxford County for several years, an additional 1,546 acres of mortality were mapped in 2025, adding to the roughly 8,000 acres mapped in 2024. In Midcoast Maine, winter moth remains a persistent defoliator, occupying the same peninsulas from the greater Bath area to Deer Isle and causing 10,107 acres of visible damage. Downeast, the major issues remain red pine scale and beech leaf disease, totaling 3,519 and 19,781 acres, respectively. Beech leaf disease damage is becoming apparent from the air in more parts of Maine each season.

Northern Maine remains a region with large areas of mapped damage, with simultaneous issues stemming from forest tent caterpillar and spruce budworm. While we received fewer reports of forest tent caterpillar feeding in 2025 than in 2024, and had hoped this meant population collapse, aerial survey told a different story, indicating that forest tent caterpillar is still quite active over 51,427 acres in Aroostook County. Field work in Fort Kent this summer also revealed that, in addition to defoliation, there is dieback and a small amount of scattered mortality to aspen in heavily affected areas. Hopefully the true extent of this damage will be revealed next season. Forest tent caterpillar should be in decline, with lower populations and the presence of caterpillar-killing pathogens that help to resolve outbreaks in the core areas. On a positive note, forest tent caterpillar aerial spray operations in 2025 appear to have dramatically reduced damage levels from forest tent caterpillars in treated sugarbushes in northern Somerset County.

As for spruce budworm, our first flight of the season resulted in an initial scare as we saw significant areas of discolored spruce-fir on the horizon. As we got closer, we were relieved to learn that these areas were across the Canadian border, and not in the areas of Maine treated during the aerial spray program in spring 2025. In some cases, the difference in treated versus non-treated areas was visible from one side of the road to the next, where roads were used as the boundary of a particular spray block. While treatments in the forested areas of northern Maine appear visually successful, areas of spruce-fir forest type growing in untreated areas closer to human populations revealed a larger affected area in 2025 than in 2024, at 3,943 acres. Efforts are underway to see whether these areas can be treated in 2026.

Browntail moth damage, which sat at the top of the list for defoliator damage in Maine in many recent years, remained low for the second consecutive season at just 4,935 acres statewide. Other points of interest from the aerial survey included 2,948 acres of hail damage from severe storms in northern Maine, confirmed with assistance from the National Weather Service, and an 83-acre ash forest almost completely entombed in fall webworm webbing.

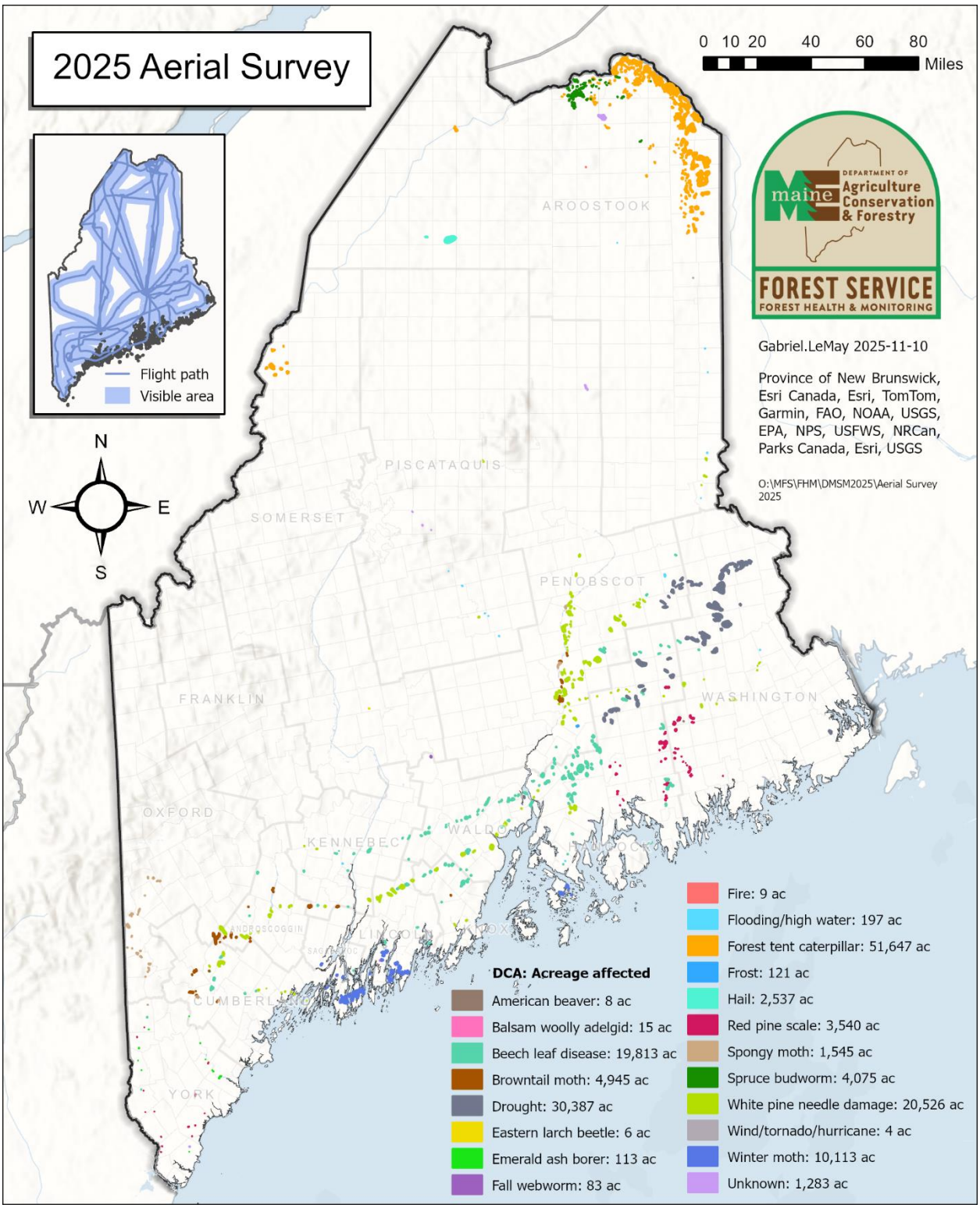

Figure: Map of 2025 Maine Forest Service aerial survey results.

INSECTS

Browntail Moth (*Euproctis chrysorrhoea*)

Browntail moth populations began to sharply decline in 2024, and this pattern continued in 2025. During the spring and early summer of 2025, Maine routinely received precipitation interspersed with sunny days, a weather pattern that favors viral and fungal pathogen activity and can help reduce populations in localized areas. In 2024, roughly 2,119 acres of defoliation were recorded and attributed to defoliation from browntail caterpillars. This year, we recorded 4,935 acres of scattered defoliation, with the most concentrated areas located on the west side of Sebago Lake in Cumberland County, where populations are still elevated.

Image: Early instar browntail moth caterpillars re-emerging from winter web.

During the growing season, the Maine Forest Service (MFS) makes weekly observations at a series of browntail caterpillar monitoring sites to document development and look for disease outbreaks. The selected monitoring sites for 2025 were in Belfast, Brewer, Bridgton, Dover-Foxcroft, Hancock, Harpswell, Newport, Old Town, Turner, and Unity. The first observation of browntail caterpillars re-emerging from their winter webs occurred on April 24. This was delayed compared to the last few years, when re-emergence occurred closer to the middle of April. This was due mostly to the colder temperatures during the spring. The first adult browntail moths were observed on July 6, roughly two weeks later than last year, which is consistent with the delay in re-emergence of the caterpillars in April. Because of the decrease in population statewide, there was difficulty this year in finding egg masses to monitor for hatching in August. Through verified reports and field observations, viral and fungal induced caterpillar mortality was observed in Durham, Newport, and Old Town, and likely contributed to caterpillar mortality in other towns as well.

It is unclear how the late-season drought conditions in 2025 may influence declining browntail moth populations in 2026. Long periods without rain can limit the spread of browntail moth pathogens and help browntail moth populations rebound. Winter web surveys scheduled to begin in January 2026 will provide insight into what to expect next spring.

Emerald Ash Borer (*Agrilus planipennis*)

Seven years after the initial detection of emerald ash borer (EAB) in York County, populations of this forest pest are building and spreading rapidly throughout most of southern Maine and making substantial inroads into the Midcoast, central Maine, and northwards along the New Hampshire border. Notably, in 2025, Maine added three first county records for Hancock, Waldo, and Somerset Counties. EAB is now found in all but five (Franklin, Knox, Lincoln, Piscataquis, and Washington) of Maine's 16 counties.

In late March 2025, an arborist working on private property in the town of Bar Harbor on Mount Desert Island (MDI), Hancock County, called Forest Health & Monitoring (FHM) to report an infestation of EAB. FHM staff confirmed EAB through photographs submitted by the arborist and a follow-up site visit to determine the extent of the infested area. Although some infested trees were identified throughout the neighborhood, the infestation appeared to be most concentrated in a high-percentage ash stand on the original property where it was reported. Follow-up visual surveys on the rest of MDI and the adjacent mainland towns of Lamoine and Trenton did not reveal any suspicious trees. Therefore, given the island geography of this infestation, the decision was made to place all of MDI under quarantine, prohibiting the movement of regulated ash items or hardwood firewood off the island until more information is available.

In late April, a similar scenario unfolded in Belfast (Waldo County), when an arborist reported EAB in a tree removed from a private property. Follow-up survey quickly confirmed EAB in the tree in question and on several neighboring properties. This stretch of US Highway 1 contains numerous campgrounds and resorts, indicating this infestation could have been introduced through infested firewood brought to one of these camping establishments. While this initial discovery occurred outside of the downtown area, several additional infested trees were also located in the downtown area of Belfast later in the season. The town of Belfast and all of Waldo County already fall within the current extent of Maine's EAB quarantine zone.

During other field work in early June, FHM staff observed a woodpecker-damaged roadside tree in Solon (Somerset County) and were able to confirm the presence of EAB larvae shortly thereafter. There were a few other suspicious trees in neighboring yards; however, there are not many ash trees in the general vicinity of the first tree to be noticed. This site was near a large vacant lot used for storage, with several log piles, as well as directly across from a hardwood sawmill. While still within Maine's quarantine, Solon is on the quarantine boundary, meaning the infestation likely extends beyond the quarantine boundaries when applying the rule of thumb that EAB is likely present within a 3-mile radius of any detection and possible within a 10-mile radius.

Maine also had a very "successful" purple prism trap monitoring program, with more positive traps in 2025 than throughout the program's entire history. When we removed traps in September, our senior entomology technician serving western Maine retrieved adult EAB from a cluster of seven traps in northern Oxford County, indicating EAB populations appear to be booming in that region.

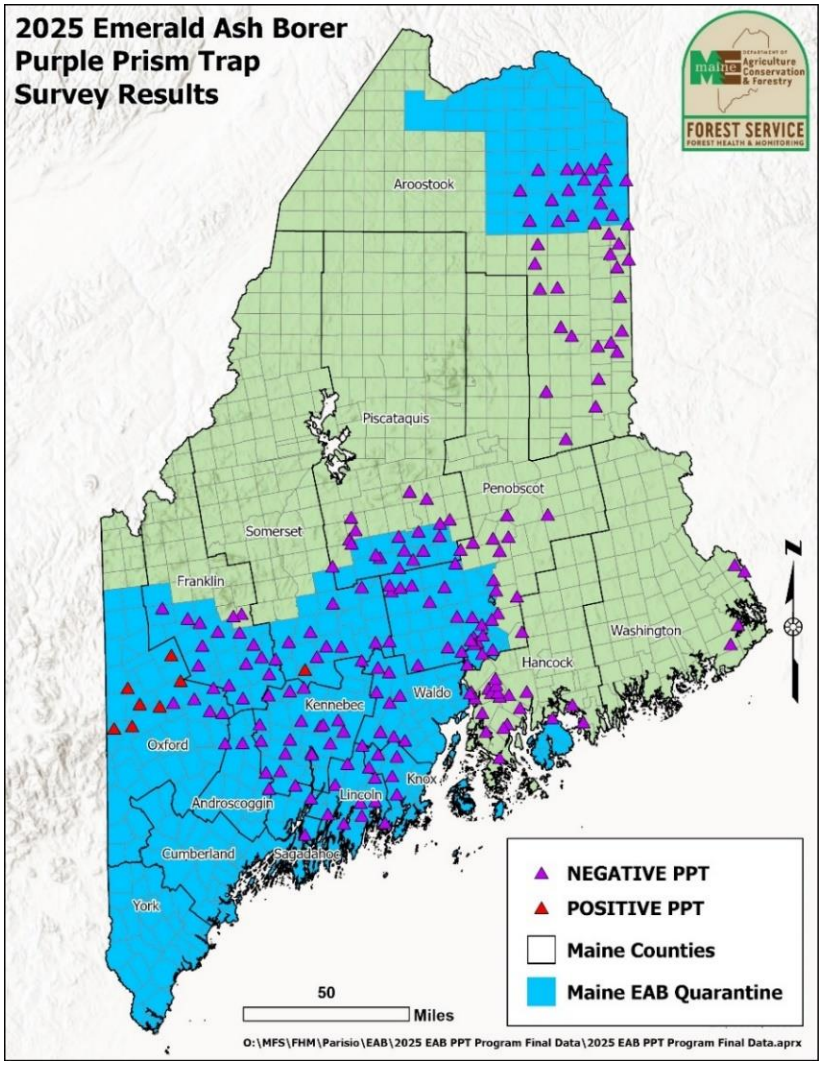

Figure: Map of 2025 purple prism trap locations used for emerald ash borer monitoring.

As we continue to uncover EAB in additional locations, we are turning more of our efforts towards long-term management and preservation, namely our ongoing EAB biological control program and newly established pesticide treatment program.

Maine continues to release all three biological control agents for EAB provided by USDA Animal and Plant Health Inspection Service (APHIS) and parasitoids were released at two new sites in 2025 in New Gloucester (Cumberland County) and Van Buren (Aroostook County). Additionally, releases continued for the second year at four established sites in Falmouth (Cumberland County), Andover (Oxford County), Lewiston (Androscoggin County), and Newport (Penobscot County), and for a third year in Waterville (Kennebec County). In total, approximately 9,138 *Tetrastichus planipennisi*, 5,355 *Spathius galinae*, and 6,429 *Oobius agrili* were released across all seven sites in 2025. We greatly appreciate the assistance of cooperators who helped with releases, including the City of Portland Forestry Division, City of Lewiston Trees & Open Spaces Division, Colby College, Gilsland Farm Audubon Center, Pineland Farms, and private landowners.

A growing network of ash trees treated by MFS is designed to act as a living refugium for Maine's ash population. By maintaining healthy trees across different landscapes, the project aims to preserve genetic diversity, cultural value, and environmental benefits while EAB continues to spread. In 2025, MFS treated a total of 108 ash trees with systemic insecticide at nine new sites across the state, tripling the number of locations treated in 2024. These locations include a mix of private properties, town forests, public state lands, land trust holdings, and university property. So far, landowners have reported encouraging results from the first year's work, noting some previously declining trees now display fuller canopies again and improved tree health post-treatment. Monitoring will continue and additional sites will be added as new partners join the program.

Combining both concepts above, 2025 saw the launch of a 10-year integrated pest management project for EAB that had been in development for over a year. This project is a multi-agency effort between USDA-APHIS, MFS, and Ash Protection Collaboration Across Waponahkik (APCAW). Prior to project launch, MFS staff located, tagged and measured brown ash trees (*Fraxinus nigra*) in two stands where biological control agents have been released. One hundred brown ash trees were also protected with emamectin benzoate injections at each site in July 2025. This effort required a two-day mobilization of the Northeastern Forest Fire Protection Compact – Forest Health Working Team and involved 14 participants from MFS, USDA-APHIS, APCAW, the New Hampshire Division of Forests and Lands (NHDFL), and Colby College. This mobilization effort was critical to implementing the research project and served as a valuable opportunity for collaborators to share knowledge around injection tools, techniques, and different approaches to ash protection.

Image: MFS staff receive guidance from USDA-APHIS staff as injections are under way during Maine's EAB integrated pest management project established in 2025.

The overall goal of the integrated pest management study is to better understand stand dynamics and survivorship of black ash during prolonged EAB infestation. All three species of parasitoid wasps will continue being released at both sites, and injections will continue for the next decade while EAB populations and tree health are continually monitored. A third research site will be added in 2026, provided a suitable stand can be located. Much of the future work on this project will be carried forward by APCAW.

Forest Tent Caterpillar (*Malacosoma disstria*)

For the fourth year in a row, a forest tent caterpillar (FTC) outbreak caused significant defoliation to aspen in Aroostook County. As in previous years, landowners reported high amounts of caterpillars on trees, roads, and other structures. Some aspens are experiencing dieback and there may be scattered mortality in areas where multiple years of defoliation have occurred on the same trees.

MFS conducted multiple aerial survey flights in the spring to determine the full extent of the damage. Observations indicated most of the defoliation to be concentrated between Madawaska and Presque Isle, in the northeast corner of the state. Correspondence with Canadian officials indicated the defoliation extended partially into New Brunswick and is roughly centered on the Maine-New Brunswick border. Total acreage of areas impacted by FTC in 2025 was 51,427, down slightly from 60,503 acres in 2024.

Historically, FTC outbreaks like the one currently affecting northern Maine usually last only a few years before populations decrease due to natural controls like pathogens and parasitoids. One such native species, the friendly fly (*Sarcophaga aldrichi*), is known to have a particularly strong impact. Prior to their potential emergence, MFS published an informational article encouraging residents to keep an eye out for species, as their presence would be a heartening signal that the FTC outbreak may come to an end soon. Sure enough, this June marked the first time during the four-year FTC outbreak that friendly flies were documented. They were observed in significant numbers by MFS staff in multiple locations in Aroostook County, as well as in Big Six Twp in Somerset County where a satellite population of FTC defoliated over 3,000 acres of sugar maples the prior year.

Image: Many "friendly flies" such as this were observed in Big Six Twp; friendly flies are a natural enemy of forest tent caterpillar and most often responsible for the decline of periodic outbreaks.

The Somerset County population was of particular concern in 2024 due to the potential effects FTC damage could pose to maple syrup production, which is highly concentrated around the Big Six Twp area. Last fall, MFS along with Cooperative Extension held a workshop for local stakeholders to discuss FTC impacts, management options, and monitoring techniques. Following the workshop, some landowners decided to initiate an aerial spray campaign targeting the areas where defoliation was observed in T7 R19 WELS and Big Six Twp. Though MFS was not directly involved with this spray campaign, MFS provided guidance to the treatment coordinators and other landowners. MFS also developed a publicly available survey tool to monitor the phenology of sugar maple buds, so that treatments could be planned for maximum effectiveness. Bud development data was contributed by private land managers and MFS staff alike, with live results displayed on an online dashboard for coordinators to use. Spray operations were completed in May during a brief window between adverse weather conditions.

Following spray treatment, both MFS and stakeholders on the ground were interested in determining the effectiveness of the application, so MFS was joined by the UMaine Cooperative Extension Maple Industry Educator for a ground survey of Big Six Twp sugar maples. While some caterpillars were observed at ground level, where presumably the spray did not penetrate through the canopy, overall defoliation was low with very little damage evident in the upper canopy. As mentioned previously, a substantial number of “friendly flies” were also observed on the ground. Subsequent aerial surveys of the area indicated no significant defoliation or higher rates of mortality. MFS was able to corroborate these observations via Sentinel-2 satellite imagery, which showed healthy crowns in stands that had been brown at the same time the previous year. Aerial survey did, however, reveal some light dieback of maples, likely a result of the caterpillar feeding a year ago. This suggests that while brief, FTC activity in the area did have a lasting effect on the forest.

Hemlock Woolly Adelgid (*Adelges tsugae*)

Hemlock health in many parts of Maine affected by hemlock woolly adelgid (HWA) remained fair in 2025 as Maine continues to benefit from the extreme cold spells in early 2023 that led to very high winter mortality of HWA in most areas. After two years of milder winters, HWA populations continue to grow, but trees still demonstrate some of the benefits from that reprieve. HWA mortality during winter 2024-2025 ranged between 44.9 and 58.6 percent across the six sites measured in 2025 and averaged 51.4 percent.

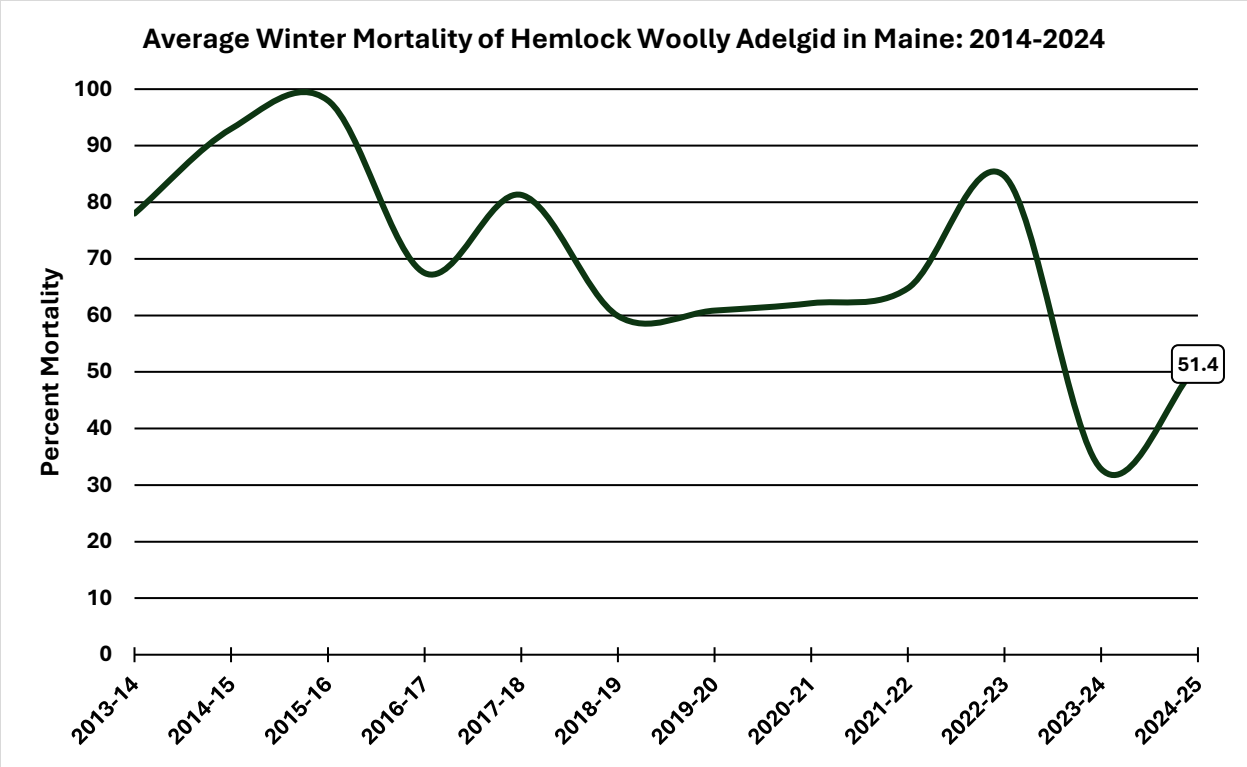

Figure: Graph of average winter hemlock woolly adelgid mortality at monitoring sites in Maine from winter 2013-2014 through 2024-2025.

MFS continues to perform visual survey for HWA in those towns forming the boundary of Maine's HWA quarantine zone and immediately outside the quarantine zone, with nearly 150 locations surveyed in 2025 to date. There were no new county-level discoveries of HWA in 2025. HWA was newly reported in Newfield, York County.

There continues to be a high public interest in HWA biological control, fostered by the continuing education and outreach efforts of MFS in partnership with Soil and Water Conservation districts and multiple land trust organizations. In 2025, organizations and individuals purchased approximately 20,400 *Sasajiscymnus tsugae* and released them throughout the distribution of HWA in Maine.

In the autumn of 2024, 1,000 lab-reared *Laricobius osakensis* were released in Bremen (Lincoln County), 500 in Lincolnville (Waldo County), and 500 in Acadia National Park in Bar Harbor (Hancock County). Because a supply of early emerging beetles from rearing colonies at Virginia Tech was also available, a further 1,000 *L. osakensis* were released in Acadia National Park, although it is unknown if these would be able to feed effectively on HWA that had not yet broken aestivation. Five hundred *Laricobius nigrinus* field-collected in Delaware Water Gap were also released in the town of York (York County). *Laricobius* sp. releases in 2025 are ongoing as of the writing of this report.

Red Pine Scale (*Matsucoccus matsumurae*)

Red pine scale (RPS) continued to expand its footprint in Maine in 2025. There are currently two separate clusters of infestations affecting the state, one of which was first confirmed in 2014 on Mount Desert Island (Hancock County), and the other, located in the southern tip of Maine (York County), was detected in 2020 and likely spread from an established population across the border in New Hampshire.

Image: A row of dead red pine in Cherryfield, ME that has declined and succumbed over the past two seasons due to the impact of red pine scale.

MFS confirmed a total of 18 new towns to have RPS in 2025. Many were recorded through aerial survey, in which staff mapped the extent of older infestations that had spread since last reporting. Aerial survey detected seven new towns in Downeast Maine (Devereaux Twp, Fletchers Landing Twp, Mariaville, T10 SD BPP, T16 MD BPP, T35 MD BPP, and T7 SD BPP) and seven towns in southern Maine (Dayton, Kennebunk, Lebanon, North Berwick, Parsonsfield, South Berwick, and Wells). Ground surveys conducted by MFS staff also confirmed RPS in one additional town in Hancock County (T9 SD BPP) and three towns in York County (Alfred, Lyman and Shapleigh), one of which was first brought to our attention by a member of the public.

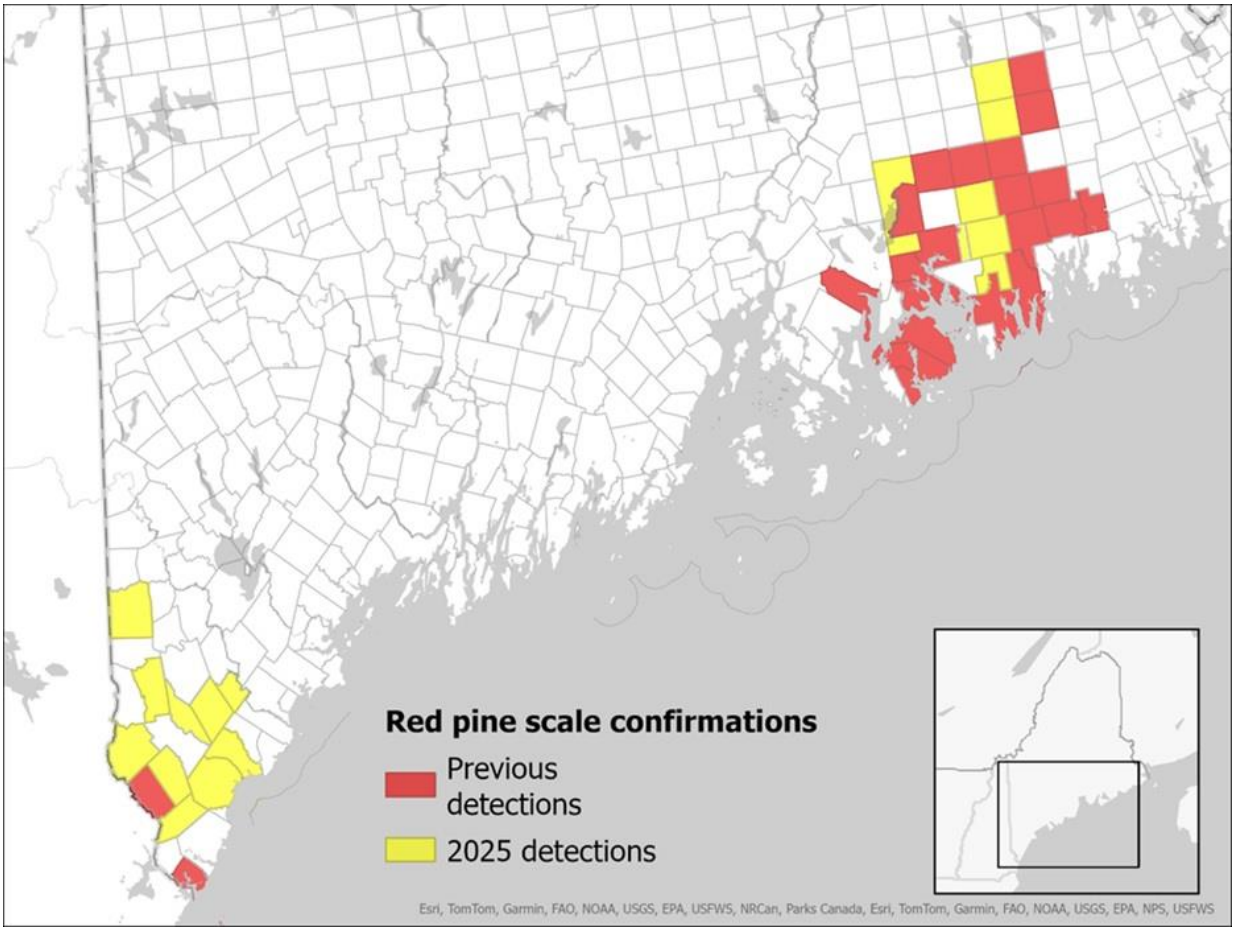

Figure: Map showing 18 new towns confirmed to have red pine scale in 2025, bringing the total number of towns in Maine to 41.

For the second year, MFS implemented a sticky trap survey to detect RPS crawlers. A total of 12 traps were placed in a combination of both known infested and uninfested towns in Downeast Maine, along the Stud Mill Rd and Airline Rd (Rt 9). Results from the 2025 survey are not yet available. As a relatively new survey methodology, initial impressions in 2024 were discouraging due to identification limitations of the collected samples. This was remedied however, when MFS reached out to the UMaine Extension Insect and Plant Disease Diagnostic Lab for genetic testing of the samples.

Encouraged by these positive detection results using PCR methods, MFS initiated a meeting between forest health cooperators and molecular researchers across the region. Participants included state agencies in New York, Vermont, and New Hampshire , as well as researchers in Canada concerned with a potential introduction of RPS into New Brunswick. This meeting appears to have sparked research collaborations between attendees that may soon benefit RPS detection efforts in Maine. Since then, a targeted qPCR assay has been developed in Canada and shared with researchers in Maine, which could provide a more efficient and cost-effective method of testing collected samples. MFS plans to support the development of this assay at UMaine and provide samples for additional genetic sequencing studies focused on RPS range expansion.

Spruce Budworm (*Choristoneura fumiferana*)

Results from the 2024 spruce budworm (SBW) population monitoring program in Maine set the stage for a busy 2025 season, including a large-scale aerial spray program in northern Maine for the first time in decades. There have been several small-scale Early Intervention Strategy (EIS) treatments on private lands over the past several seasons, but the results of the 2024 overwintering larval (L2) survey revealed that there were two large areas of forest in northern Maine with L2 populations meeting the threshold for treatment under an EIS framework.

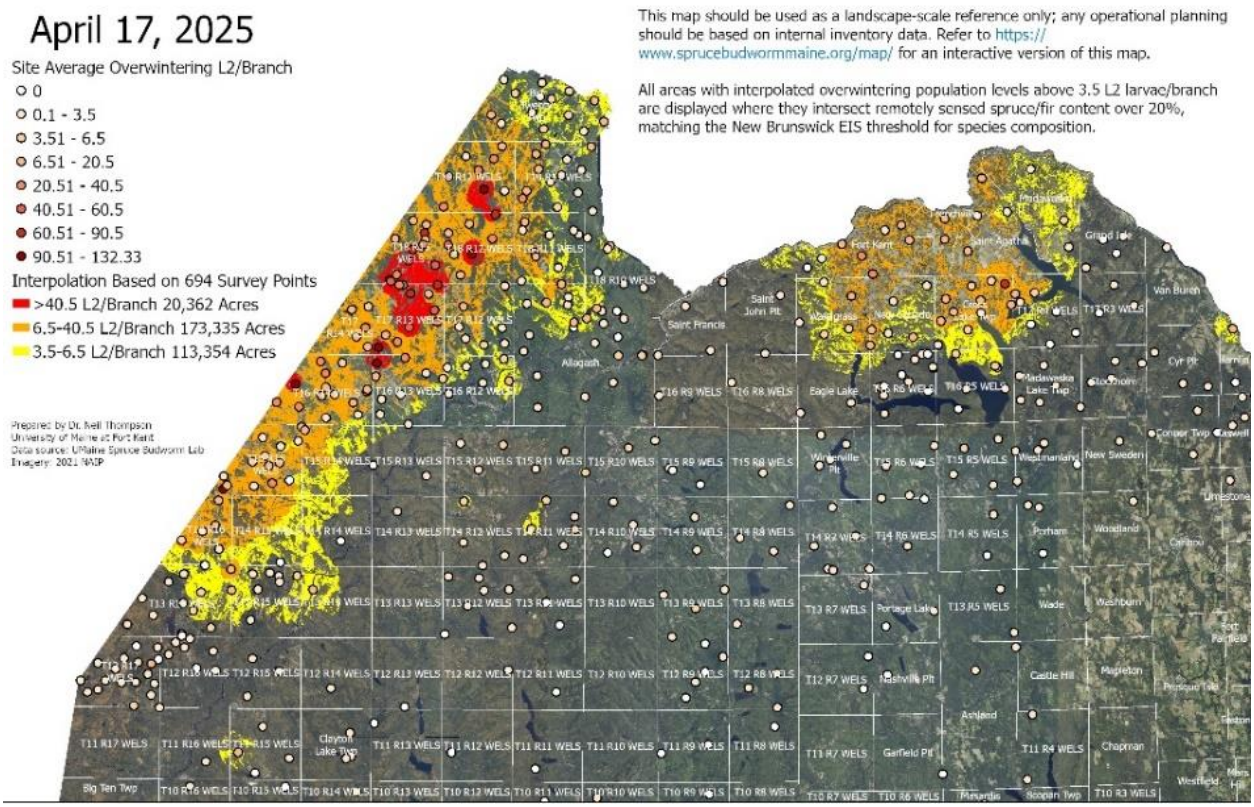

Figure: Map showing areas in northern Maine where models using 2024-2025 larval survey data predict spruce budworm populations were at (orange) or above (red) the Early Intervention Strategy management threshold of seven larvae per branch. (Neil Thompson, University of Maine at Fort Kent)

The need for a large-scale and coordinated treatment program led to the formation of the Maine Budworm Response Coalition (MBRC), consisting of owners and managers of large blocks of forest in northern Maine involved in planning and logistics, contractors for operations, and government partners involved in planning, environmental reviews and grant management. MBRC leadership successfully advocated for Federal and State funding of the program.

Once operations were prepared, aligning the start of the spray program with the correct host tree phenology was supported by MFS with a Survey123 app and an accompanying dashboard to display tree development across the entire treatment area.

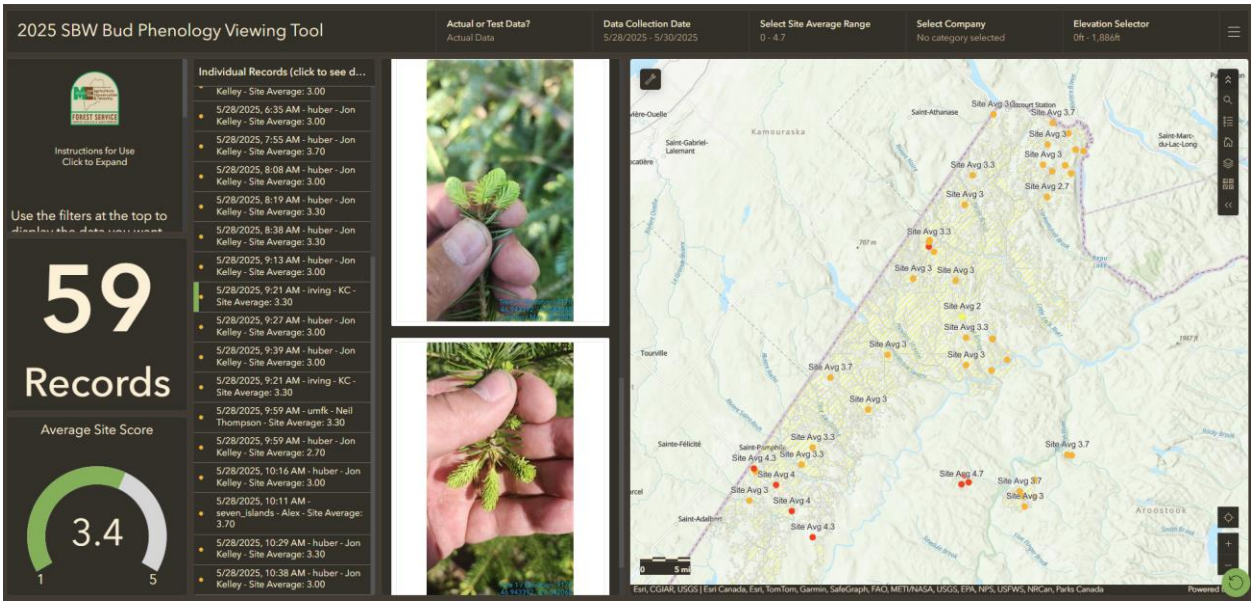

Figure: Screenshot of 2025 SBW Bud Phenology Viewing Tool showing an example of the survey points throughout the intended spray area taken immediately before spray operations began to ensure bud development had reached the proper stage for spraying to be most effective.

The treatment area was divided into two core areas, with a larger unpopulated area in western Aroostook County and a smaller, more-populated area to the east in central Aroostook County. Treatments employed either fixed-wing or rotary-wing aircraft which applied either Mimic 2LV (tebufenozide) or Foray 76B (*Bacillus thuringiensis kurstaki*). Following test flights on May 29, the stars aligned immediately following Memorial Day weekend. Spraying began in earnest on June 2, and the entire project was completed by June 9. On June 3 alone, aerial treatment occurred over an impressive 74,000 acres. While there is still much data to finalize for the 2025 monitoring season, initial results from monitoring programs, as well as field observations, indicate a successful treatment program.

MFS, assisted by University of Maine Fort Kent (UMFK) Professor Neil Thompson, hosted an after-action review in northern Maine during the week of August 11 with two days of demonstrations and discussion in the field. Attendees included members of the MFS, US Forest Service, University of Maine (Fort Kent and Orono), MBRC, Maine Board of Pesticides Control, Maine Inland Fisheries & Wildlife, and our counterparts from the State of New Hampshire. The goal of the workshop was to review monitoring and management activities over the past years, discuss challenges of the treatment program and how they might be the same and different in coming years, and share these lessons with those who are still awaiting the arrival of spruce budworm, namely our neighbors in New Hampshire. Topics included pheromone trap monitoring, L2 monitoring, field survey tools and techniques, and rules, regulations, and logistics.

Image: Participants in the August 2025 spruce budworm field tour in Fort Kent, ME including Maine Forest Service, US Forest Service, Maine Board of Pesticide Control, University of Maine at Fort Kent and Orono, and New Hampshire Division of Forests & Lands.

This season, MFS decided to take a closer look at its pheromone trap monitoring program. We have been actively replacing our monitoring sites that have "aged-out" of habitat suitability over the life of the historical program with new sites that meet stand requirements. A few seasons of inconsistent catch data encouraged us to reconsider our pheromone lure and trap combination. In 2025, MFS implemented a pilot project switching from Solida to Synergy lures and from Multipher to Unitraps. Results from this new combination appear to be back in line with what we expect to see based on historical data, and fortunately, captures were low in areas treated during the 2025 aerial treatment program. A small study is also underway at UMFK, comparing moth captures using all combinations of the Solida/Synergy lure and the Multipher/Unitrap options.

Elsewhere in the northern forest, we continue to compare trap captures with New Hampshire, Vermont, and most recently New York, which added a program after BioSim flight models indicated moths from the regional outbreak in western Quebec and Ontario may have been deposited into New York's Adirondack region.

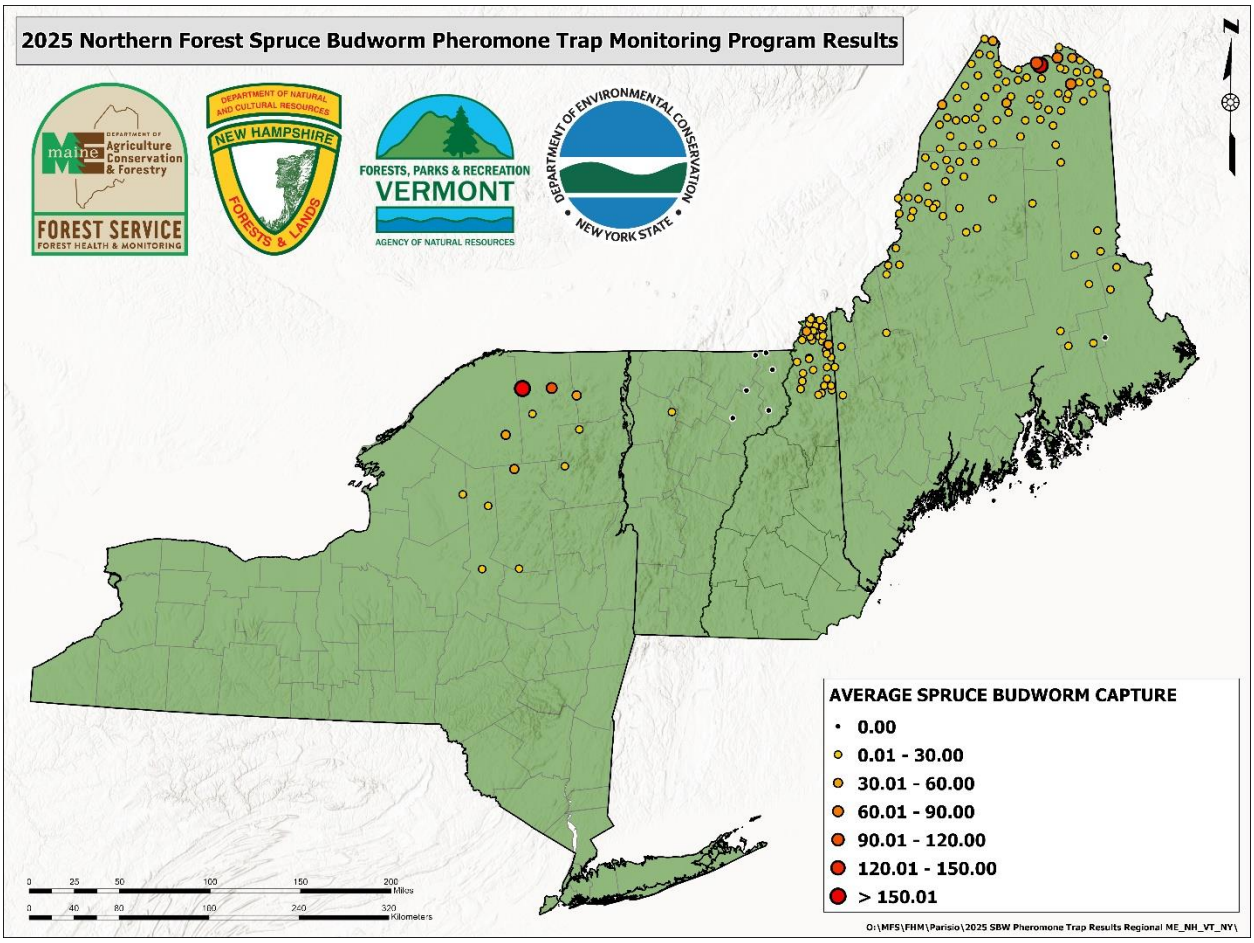

Figure: Regional map of spruce budworm pheromone trap monitoring results across Maine, New Hampshire, Vermont, and New York.

All eyes are now on the 2025 L2 monitoring program results, which will continue to roll in throughout the winter months. A specific subset of these monitoring sites was targeted for early processing, especially sites from treated areas. This is considered the best measure of success of the EIS implementation, and the Spruce Budworm Lab at University of Maine Orono reports that 95 percent of sites evaluated from treated areas show decreases in L2 populations when compared to the same sites' samples prior to treatment during the 2024 season.

As results from L2 surveys accumulate, this information is continually fed into an interpolation model to understand current SBW populations across the landscape across the region. As illustrated by the map below, Maine continues to have a large area with elevated SBW populations that are poised to escape control by natural mortality factors. But, as the proactive EIS approach has demonstrated in Atlantic Canada, we expect the net acres treated and costs of treatment to be lower if Maine landowners continue to employ the EIS rather than follow a reactive approach and employ management after a full-blown spruce budworm outbreak has developed.

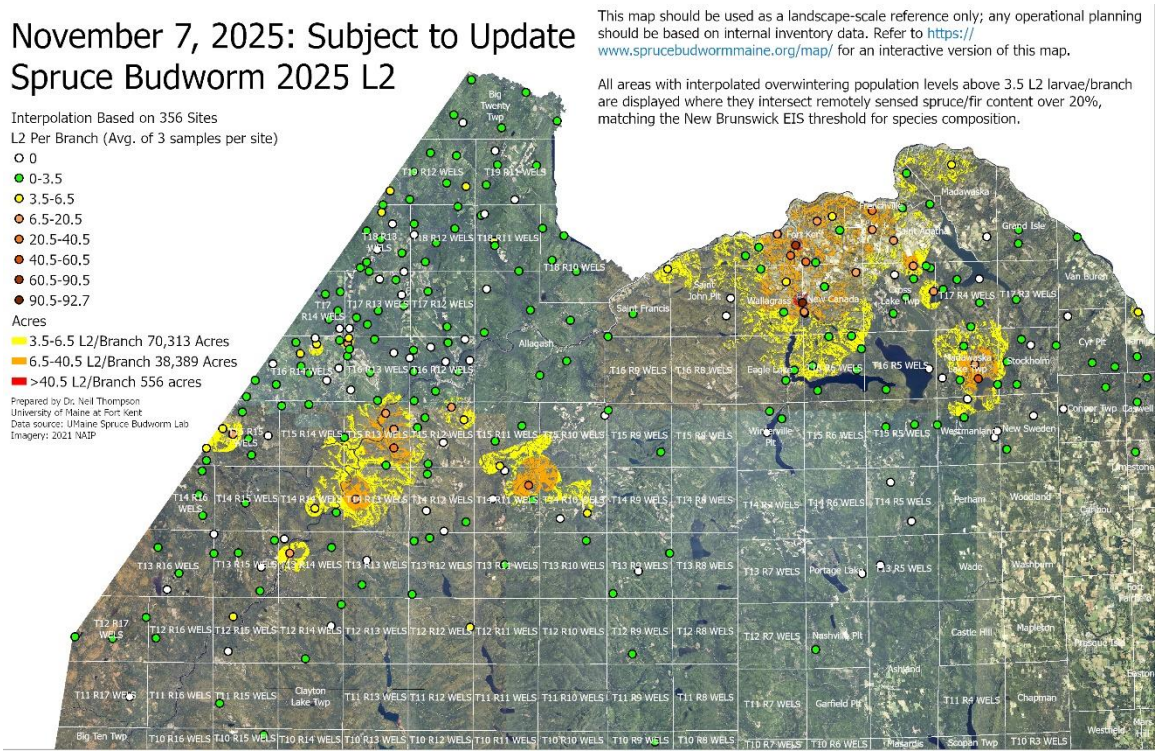

Image: Most up to date larval sampling (L2) interpolation map demonstrating areas of concern for elevated spruce budworm populations and potential treatment areas to be targeted in 2026. (Neil Thompson, University of Maine at Fort Kent)

Winter Moth *(Operophtera brumata)*

Since 2013, MFS has been releasing the parasitoid fly *Cyzenis albicans* as a biological control for winter moth. The Nature Conservancy's Basin Preserve in Phippsburg was chosen as the 2025 release site due to the severe defoliation in the surrounding area. An emergence cage containing 2,242 pupae gathered during collection efforts in spring 2024 was buried at the site in October 2024 to overwinter under natural conditions. The emergence cage was then opened on May 1, 2025, to allow emerging flies to disperse into the surrounding areas.

Image: Newly emerged Cyzenis albicans mating in the emergence cage prior to their release in Phippsburg, ME in May 2025.

The annual caterpillar collection effort for biocontrol in spring 2025 looked much different compared to previous years. Through a mobilization of the Northeastern Forest Fire Protection Compact-Forest Health Working Team, MFS hosted eight forest health staff from the states of Rhode Island, New Hampshire, and Vermont. A major goal of this mobilization was to collect enough *Cyzenis albicans* to share with Rhode Island, which is also experiencing an outbreak of winter moth. Although fly releases occurred in Rhode Island, the parasitism rates remain low. This multi-state effort helped bolster the number of winter moth caterpillars collected and thus the amount of *Cyzenis albicans* collected for biological control for both Maine and Rhode Island in 2026.

During the mobilization, collection efforts concentrated on Maine's Midcoast peninsulas where the cooler climate delayed development compared to more inland sites. Samples were collected from Boothbay and South Bristol during the mobilization, with attempted collections at sites in Bath and West Bath proving unproductive due to timing.

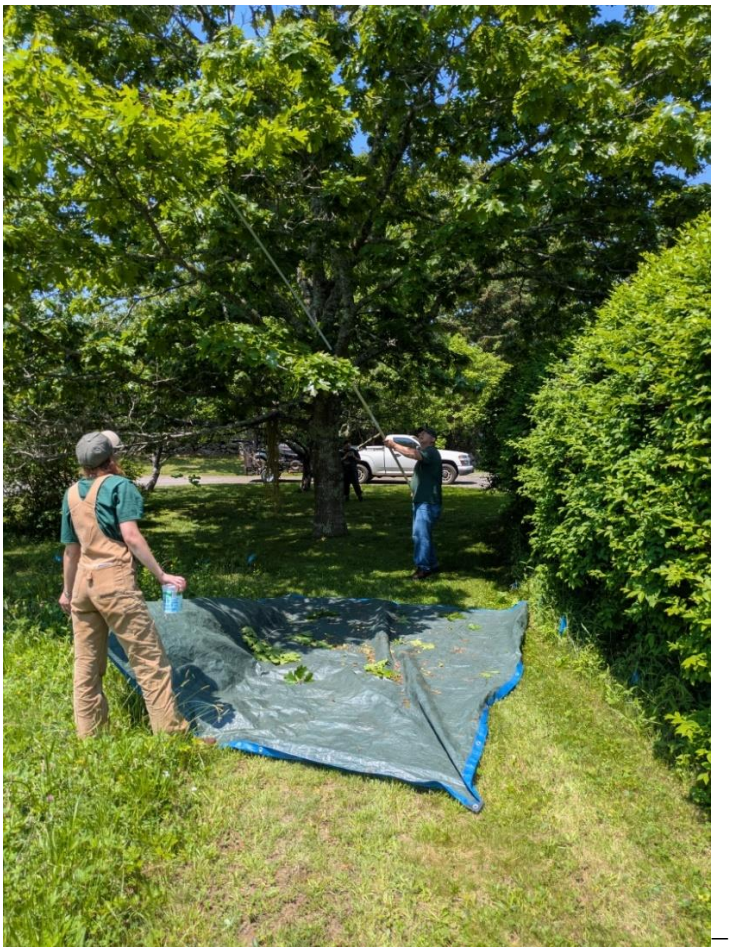

Image: Collecting winter moth caterpillars in South Bristol, ME

MFS staff performed three days of collection efforts outside of the mobilization in Lubec, Northeast Harbor, Boothbay, South Portland, and two sites in Kittery. Staff were joined at the latter three sites by cooperators from UMASS Amherst, who graciously donated their time and effort to help collect as well as rear caterpillars collected at all sites this year. A total of 11,267 caterpillars were

collected in 2025, including 3,618 collected in Rhode Island, towards this combined effort. Parasitized caterpillars from these populations yielded 1,541 pupae from Maine and an additional 95 pupae from Rhode Island for a grand total of 1,636 *Cyzenis albicans* pupae to be split evenly between Maine and Rhode Island for 2026. Despite more hands-on-deck for collection efforts this year, the gain in numbers of caterpillars collected was unfortunately offset by the lower parasitism rates at some of the collection sites than in past years.

Image: Group photo of the participants in the 2025 winter moth mobilization representing Maine, Rhode Island, New Hampshire, and Vermont.

DISEASES

Beech Leaf Disease (*Litylenchus crenatae mccannii*)

Beech leaf disease (BLD) continues to be found in new areas of the state with the disease confirmed across large portions of the southern half of the state. Currently, the most northern area with confirmed BLD is in the town of Merrill (Aroostook County). BLD is now found in 395 Maine towns and 75 percent of these towns have been confirmed in the past two years.

BLD long-term monitoring plot work was completed during the end of July and early August. This year was the first time we recorded mortality of mature beech trees due to BLD since monitoring plots were established in 2021, the year BLD was confirmed in Maine. Based on mortality observations from southern New England where BLD has been present for a few years longer than in Maine, we can expect mortality rates to rise steadily in the coming years.

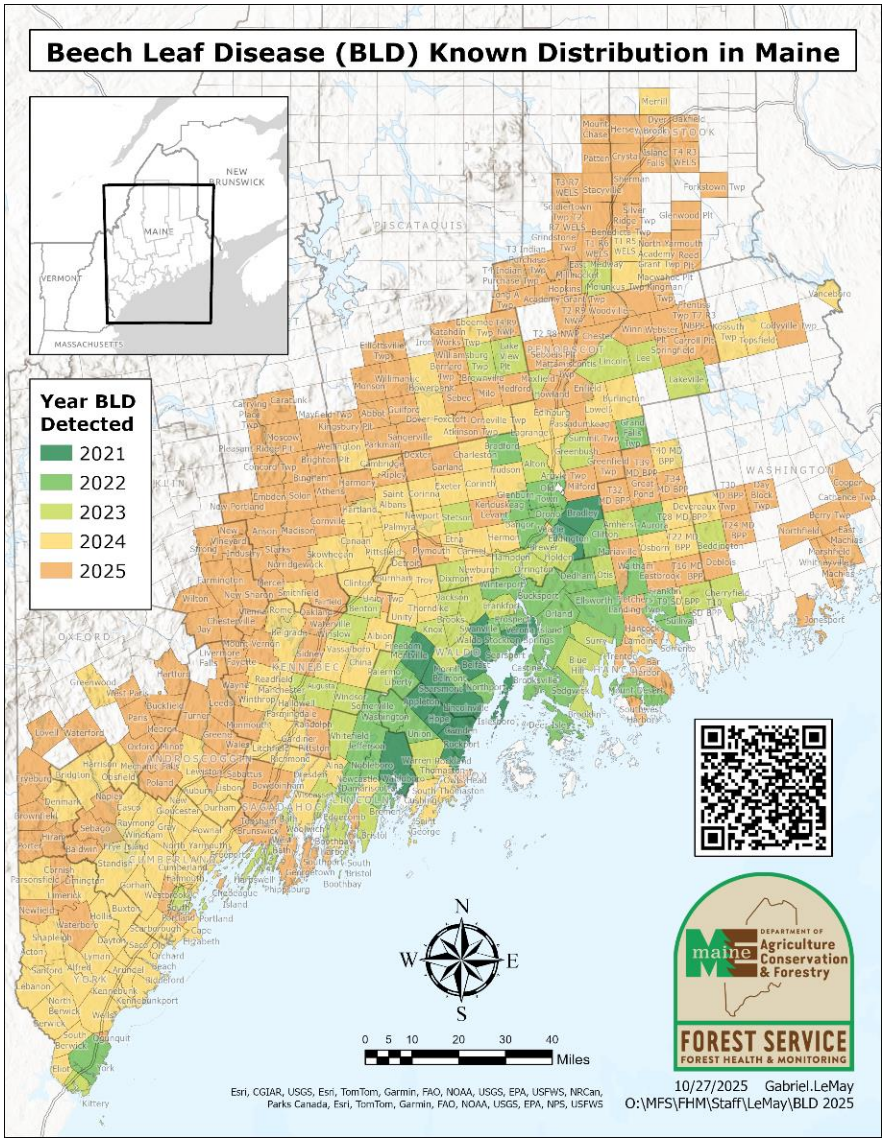

Figure: Current town-level distribution of beech leaf disease in Maine by year.

BLD management trials for 2025 included three approaches: macroinjection with Thiabendazole, soil drench with potassium phosphite and basal bark application of potassium phosphite. Twelve more trees at four new sites (Lakeville, Skowhegan, Somerville, Sullivan) were treated with macroinjection of Arbotect 20S (Thiabendazole). The 2025 treatment sites were coordinated by MFS Forest Pathology with the cooperation of Maine's Bureau of Parks and Lands, Somerset Woods Trustees (Land Trust), as well as an individual private landowner. The trees selected for treatment in 2025 all showed high resistance to beech bark disease. Treating these trees serves two purposes: to demonstrate how well Thiabenzadole limits BLD symptoms and to protect the rare beech bark disease-resistant genetics of these trees.

As an addition to the potassium phosphite soil drench BLD treatment trial at Viles Arboretum in Augusta (ongoing since 2023, treated twice yearly, one month apart), MFS Forest Pathology added potassium phosphite bark drench replicates to the trial. This included 12 trees in the three different size classes included in the soil drench trial. Also, bark drench trials have been initiated at six other sites, including a total of 29 trees (Charleston, Knox, Lakeville, Skowhegan, Somerville, Sullivan). This brings the total of BLD-infected trees included in potassium phosphite bark drench trials to 41.

MFS also assisted USFS Durham Field Office forest pathologist, Cameron McIntire, in a dose-dependent potassium phosphite bark drench treatment. This trial was established in cooperation with the University of Maine forests on University of Maine-owned land and includes over 100 beech trees.

Additionally, MFS Forest Pathology has provided BLD-management information to Maine's Inland Fisheries & Wildlife, as they are considering larger-scale preservation of beech trees on their lands. MFS will continue to support their efforts toward landscape-level BLD management in an advisory capacity.

With close to 150 trees currently included in bark drench trials and 24 trees macroinjected with Thiabendazole, it will be very informative to see how treated trees respond to these BLD management attempts. We are cautiously optimistic that the applied treatments in our trials will be successful and that these efforts will lead to Maine-specific information and tools we can share with beech tree owners and land managers who want to protect their valued trees.

Chaga/Cinder Conk (*Inonotus obliquus*)

The concept of chaga farming in the US first came to our attention in late 2022, when MFS was requested to provide input on the decision regarding a federal permit application to import hardwood dowels inoculated with the fungus *Inonotus obliquus* from Europe. MFS was not supportive of the permit without verification that the strain of fungus within the dowels was from a Maine source. However, the permit was eventually approved, and a business promoting chaga cultivation began operations in Maine. As of January 2025, the business reported to the news media that they had established nearly 40 chaga farms, covering 9,000 acres in Maine, using more than two million inoculated dowels. Recently, a second company has been exploring branching out from Europe into the chaga cultivation business in Maine.

Due to the importance of birch-dominated forest types in Maine and the scarcity of literature on chaga farming and its unpredictable impacts on broader forest health in the northeastern forests, MFS has taken a conservative stance on the practice. We have collaborated with partners in the region, led by the USFS, State, Private, and Tribal Forestry pathologists in Durham, NH, to establish chaga cultivation demonstration sites where the impacts can be tracked. Sites mimicking the cultivation practices communicated by the business have been established in New Hampshire on property owned by the NHDFL and in Maine on properties owned by the University of Maine and the USFS. The partners' intent is to track the development of these sites over time to gain insights into the development of cultivated chaga and its impact on the trees and the surrounding forests.

Finally, since chaga farming has taken off in Maine, MFS wanted to ensure that those contemplating diving in would have access to forest health-focused information before deciding to augment the occurrence of a pathogen on their properties. The MFS pathologist has endeavored to ensure that information on the disease that leads to chaga creation, as well as some of the potential environmental impacts of chaga cultivation based on available literature and general forestry and forest pathology knowledge, is available. An information sheet and FAQ are available on the MFS website, and a set of guidelines to consider when contemplating chaga farming has been drafted. The draft guidelines will be refined in collaboration with pathologists at the USFS Durham Field Office and other forest health experts. The information presented by the MFS will be refined as we learn more about chaga cultivation from the demonstration sites.

Images: (left) Visible external structure of chaga conk on the exterior of a birch tree. (right) A sawn birch log revealing the extensive interior decay column associated with chaga infection.

European Larch Canker (*Lachnellula willkommii*)

Winter 2025 survey for European larch canker (ELC), a federally regulated disease of larch species (*Larix* spp.) was successful and informative. Unlike 2024, the frozen conditions in early 2025 allowed safe, easy, and extended access to wetland and bog areas where eastern larch can be found in abundance, enabling surveyors to closely examine trees for presence of ELC cankers. Over 100 sites were assessed and mapped in 2025. Importantly, we surveyed many sites with excellent larch populations, but no confirmed ELC presence. These will serve as superior sites to revisit in future years of survey. We did confirm ELC in two new towns, Vanceboro (Washington County) and Jefferson (Lincoln County). The Vanceboro find is near the Canadian border, and both detections occurred close to the current extent of the Maine ELC quarantine boundary that was revised and expanded in 2023. Finding ELC in these new locations, quite far from the coastal areas thought to provide key environmental conditions for ELC disease development, shifts our understanding of ELC and its potential distribution and possible spread since its initial confirmation in Maine in 1981 (Lubec, Washington County).

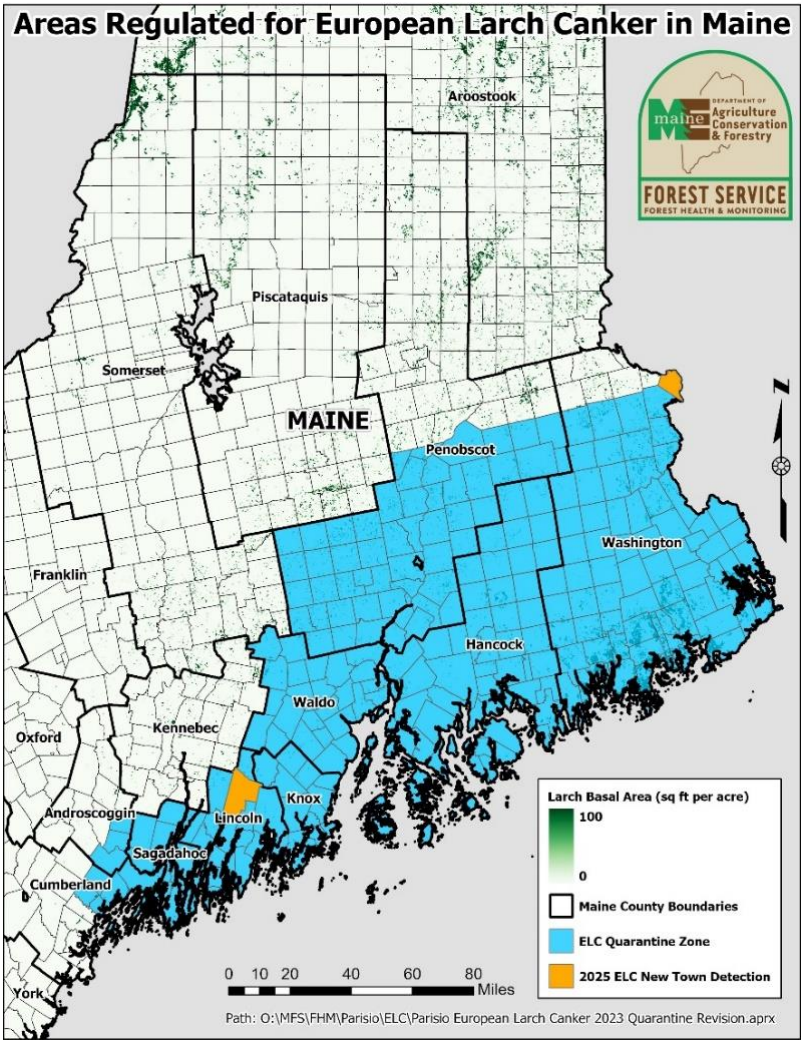

Figure: Map of Maine towns in included in Maine's European Larch Canker quarantine and highlighting two new town detections in 2025 in Jefferson and Vanceboro.

ELC eradication efforts at the Brunswick Country Club (BCC) continued in 2025. This location was confirmed as infested with ELC in 2007, prompting action by MFS and federal partners to address this satellite area of ELC infection, once outside of the Maine quarantine zone (in 2023 state quarantine boundaries were expanded to include Brunswick).

In early April of 2025, all larch trees on the BCC golf course were assessed for disease severity based on number and location of cankers. Data on general tree health and crown conditions were also collected. During survey, 29 cankers were removed via pruning by MFS staff. Of the 53 remaining *Larix* spp. trees on the course, ten trees were flagged for removal and 12 were identified for pruning with the use of a lift (cankers were too high in the crown for pruning by MFS personnel). Management recommendations toward eradication of ELC at the location were developed and provided to the BCC groundskeeping staff, who will integrate these into their overall management of the course's trees. Roughly 50 trees have been removed by the BCC in the past five years, highlighting the progress of this cooperative effort.

Guide to Abbreviations

APHIS: USDA Animal and Plant Health Inspection Service
BLD: Beech leaf disease
BTM: Browntail moth
EAB: Emerald ash borer
EIS: Early Intervention Strategy
ELC: European larch canker
FHM: Forest Health and Monitoring
FIA: Forest Inventory and Analysis
FTC: Forest tent caterpillar
HWA: Hemlock woolly adelgid
L2: Second instar spruce budworm larvae
MBRC: Maine Budworm Response Coalition
MFS: Maine Forest Service
NHDFL: New Hampshire Division of Forests and Lands
RPS: Red pine scale
SBW: Spruce budworm
USDA: United States Department of Agriculture
USFS: USDA Forest Service

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