



PPQ 2022 Annual Report

Optimizing Pest Management: Tree and Wood Pests

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Introduction

The Tree and Wood Pests (TWP) program protects forests, private working lands, and natural resources from the Asian longhorned beetle (ALB), emerald ash borer (EAB), spongy moths, and most recently shot hole borers (SHB). Numerous native hardwood tree species that are common throughout the United States are vulnerable to these pests. The U.S. Department of Agriculture’s Plant Protection and Quarantine (PPQ) program cooperates with Federal, State, Tribal, and local agencies, organizations, and institutions to conduct survey, regulatory, control, and outreach activities in 48 States to manage and, in some cases, eradicate these pests.

Conserving forests enhances the economic vitality of rural communities by supporting forest-related industries, recreation and tourism, and the overall livability of communities. The value of forest products that PPQ protects is over \$200 billion (U.S. Forest Service, USFS). In addition, trees in residential areas

lower cooling bills, filter pollutants from the air, decrease runoff, and improve residents' quality of life (U.S. Environmental Protection Agency).

Asian Longhorned Beetle

The ALB threatens forest resources nationwide, as roughly 30 percent of U.S. trees are potential ALB hosts. The program's ALB eradication activities prevent multi-billion-dollar losses to the maple syrup, timber, tree nursery, trade, and tourism industries.

ALB was first detected in Brooklyn, New York, in August 1996, and was later found in other areas of New York, Illinois, New Jersey, Massachusetts, Ohio, and in FY 2020, Charleston, South Carolina. The program has successfully eradicated ALB from Chicago, Illinois; Islip, Staten Island; Brooklyn, Queens, and Manhattan, New York; Jersey City, Middlesex County, and Union County, New Jersey; and Batavia, Stonelick, and Monroe Townships, Ohio. The program continues to match State and Federal quarantine boundaries and conduct activities in regulated areas of New York, Massachusetts, Ohio, and South Carolina.

PPQ's eradication strategy for ALB includes surveys, regulatory inspections and quarantine restrictions, removal of infested and high-risk trees, and chemical treatment applications. PPQ conducts several cycles of surveys to determine the scope of infestation, establish a quarantine area, identify trees to remove or treat, determine if the pest has spread outside of the established quarantine area, and determine when to release an area from quarantine.

A survey cycle is the time it takes to complete a survey of a given area, which can take several years depending on the size of the area, the density and type of trees in the area, and type of landscape or land use. PPQ can declare eradication after a minimum of 4 years between the last detection of the pest in a given area and the completed final survey cycle, when PPQ can declare eradication. PPQ provides ongoing support to evaluate new methods and protocols to combat regulated pests and tailors project responses to site-specific conditions, resulting in a more efficient program. Currently, each regulated area is at a different stage of eradication and faces unique, local conditions. In FY 2022, the program surveyed a total of more than 656,000 trees across the four regulated areas.

In the Long Island, New York, outbreak, the program surveyed 42,515 trees and found only 14 new infested trees in FY 2022. The program prepared for additional removals of high-risk host trees in the quarantined zone by contacting and gaining approval from homeowners. Tree removals will take place in FY 2023. The New York ALB program also collaborated with the U.S. Forest Service (USFS) on a risk-based model for beetle dispersal using past infested tree data to help determine areas of low risk and where to prioritize survey efforts. The program has surveyed a cumulative 1.7 million trees in Long Island over the program's life and removed more than 8,000 trees.

To address ALB in Worcester County, Massachusetts, the program continued ongoing survey efforts—surveying nearly 266,000 trees in densely wooded, hard-to-access areas in FY 2022. The program found no new infested trees in Massachusetts, indicating the program is making progress. Over the program's lifetime, the program has surveyed more than 10 million trees and removed 36,263 high-risk host and infested trees.

In Tate Township, Ohio, the program surveyed nearly 279,000 trees, found 77 new infested trees, and removed more than 1,000 infested and high-risk host trees in FY 2022. After completing final surveys of host trees in a portion of the quarantined area, PPQ issued a Federal Order to remove 7.5 square miles of the ALB quarantine area of East Fork State Park, in Batavia and Williamsburg Townships, Clermont County, Ohio. Surveying and infested tree removal efforts continued in the remaining 49 square miles of the Ohio quarantine area. The program has surveyed a cumulative 4.3 million trees in Ohio and removed approximately 115,000 since the initial detection in 2011.

In FY 2022, efforts in South Carolina (the most recently detected outbreak) focused on ALB surveys in the southern part of the quarantine area and removal of infested and high-risk host trees in the core area of the infestation. This regulated area includes forested and wetland areas, making access for surveys and tree removals challenging. Experienced staff from other ALB regulated areas deployed to the South Carolina outbreak to provide support. The program surveyed nearly 69,000 trees and removed 1,530 in FY 2022. In South Carolina, the program has surveyed approximately 142,000 trees since FY 2020 and removed approximately 6,500.

In FY 2019, the program began investigating the use of unmanned aerial systems (UASs) equipped with digital cameras as an additional survey tool. In FY 2020, the program planned to continue the investigation of this tool and its use. Due to travel-related COVID-19 restrictions, much of the work did not occur at the planned pace in FY 2020 or FY 2021. In FY 2022, the program conducted the UAS evaluation to determine if it could inspect ALB damage and conduct host tree mapping. The results of the testing concluded that the camera performance was insufficient for visual surveys under the tree canopy, and it was not able to accurately diagnose ALB damage. However, the UAS has the potential to map locations of ALB host trees. The program may consider the use of UASs to determine locations

where ALB host tree surveys are needed and provide host mapping in areas where ground access is difficult. This includes the wetland areas in South Carolina.

Emerald Ash Borer

Another forest pest of concern is EAB. In 2002, this pest was first detected in Michigan and has since been detected in 34 additional States and the District of Columbia. In FY 2022, PPQ detected EAB in Oregon and confirmed detections in 42 new counties.

EAB has spread beyond what a regulatory program can control. In FY 2019, PPQ initiated proposed rulemaking to deregulate EAB and redirect resources for controlling the spread of this devastating pest using biological control agents and exploring ways to preserve ash resources. On September 19, 2018, PPQ published a proposed rule in the Federal Register to remove the EAB Federal domestic quarantine regulations. In FY 2020, PPQ reviewed and responded to all comments received during the open public comment period and in FY 2021, PPQ published the final rule to remove the Federal domestic EAB quarantine. In FY 2022, PPQ continued to transition from a regulatory program to a management and biological control program. In support of the transition, PPQ provided more than 2,000 EAB survey traps and held three webinar training workshops for State and Tribal cooperators in 22 States in FY 2022.

The program's biological control initiative is designed to effectively manage EAB populations. It provides a promising strategy, using four species of parasitic stingless wasps for long-term EAB management. To date, the EAB program has cumulatively released a total of more than 8 million parasitic wasps in 369 counties within 31 states and Washington, D.C.

PPQ and cooperators continue to assess the impacts of the parasitic wasps on EAB populations and tree health at release sites and nearby areas. Field evaluations indicate the EAB parasitoid wasps and other EAB natural enemies are protecting sapling ash from EAB.

Spongy Moths

The spongy moth (SM, formerly known as the European gypsy moth) is a destructive pest for some of North America's most beautiful and popular deciduous trees, including maples, oaks, and elms. This pest is established in all or parts of 20 northeastern, mid-Atlantic, and Midwestern States, as well as the District of Columbia. PPQ and State cooperators conduct regulatory activities in the quarantine area to prevent the human-assisted spread of the pest and the establishment of SM populations in non-quarantine areas. These efforts include inspection, treatment, and certification of regulated articles for movement from quarantine to non-quarantine (non-infested) areas.

The program issues compliance agreements and conducts public outreach to ensure that businesses and residents in infested areas comply with regulations to prevent long-distance spread of the pest. EGM also spreads naturally into areas bordering the quarantined zone. PPQ monitors the transition zone along the 1,200-mile-long border of the quarantine area to ensure that newly infested areas are added to the quarantined zone and regulated effectively. Working with the U.S. Forest Service (USFS) and the EGM Slow-the-Spread Foundation, PPQ and cooperators have greatly reduced the rate of EGM's spread and eradicated isolated populations, preventing this pest from becoming a larger issue. In FY 2022, PPQ and State cooperators continued to conduct EGM surveys to detect, delimit, and eradicate any isolated populations.

Flighted spongy moth (FSM, formerly known as Asian gypsy moth) is an invasive threat to North American urban and natural forests because of its broad host range, demonstrated damage potential, and its ability to compromise an effective management system that has taken nearly 100 years of research to assemble. AGM poses a particular risk to western areas because of its ability to hitchhike on shipping vessels from Asia. PPQ supports the exclusion of AGM through negotiations and support of offshore ship inspection and certification. Due to an increase in AGM egg masses that were intercepted on ships in 2012, PPQ, the U.S. Department of Homeland Security's Customs and Border Protection, and the Canadian Food Inspection Agency conducted increased outreach to the maritime shipping trade over the last several years.

In FY 2022, PPQ and State cooperators performed a precision delimitation response, to determine if there was a population present in Washington following a single AGM detection in FY 2021. The precision delimit response did not detect any additional moths. Additionally in FY 2022, PPQ supported post-treatment delimitation responses following eradication treatments for a single detection of AGM in Washington and for EGM at a single location in Minnesota. The program and its partners also conducted delimiting surveys in California and Oregon, for AGM that were detected in FY 2019 and FY 2020. The surveys did not detect any additional moths.

Shot Hole Borers

Various non-native shot hole borers have been detected in several States and hosts, including numerous woody trees in forests and urban landscapes, cultivated tea, and avocado. Shot hole borers are also called ambrosia beetles because they have a symbiotic relationship with ambrosia fungi, which they

vector from tree to tree. The fungi disrupt the vascular system of impacted trees. In recent years the polyphagous and Kuroshio shot hole borers and diseases they cause have been devastating riparian habitats in southern California and urban areas in other parts of California. At California's request, PPQ and USFS helped establish a working group, led by USFS, with the goal of strategically addressing the shot hole borers in California.

In FY 2022, PPQ continued to provide support for addressing the management of shot hole borers in California. This support included assisting with the foreign exploration of biological control agents and continuing efforts to determine host specificity of parasitoids on SHB populations. PPQ plans to continue these projects in FY 2023.