

**U.S. Department of Agriculture  
Animal and Plant Health Inspection Service  
Report on the Arrival in the United States of Forest Pests  
Through Restrictions on the Importation of Certain Plants for Planting**

*This report fulfills the requirements of the Agriculture Improvement Act of 2018, Section 10110.*

U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS) safeguards our Nation's forests and natural resources from non-native tree and wood pests, like the Asian longhorned beetle, emerald ash borer, and gypsy moth. We work with international organizations, trading partners, and U.S. industries to make sure traded commodities meet our plant health requirements and are free of pests of concern. At ports of entry, we work with U.S. Customs and Border Protection (CBP) to intercept pests in imported goods and keep them out of the United States. Across the country, we cooperate with Federal, State, Tribal, and local agencies, organizations, and institutions to manage and, when possible, eradicate economically and environmentally significant pests that enter and establish in this country. Our work enhances the economic vitality of rural communities by supporting forest-related industries, recreation, and tourism, and the overall livability of our communities. According to the U.S. Forest Service, the value of forest products that APHIS protects is over \$200 billion.

**The Effectiveness of the U.S. Government in Intercepting Pests in International Shipping and on Plants for Planting**

To protect America's farms and forests from harmful pests, APHIS has created a system of safeguards that begins in other countries, continues through U.S. ports of entry, and extends across the Nation. It's called the Safeguarding Continuum. All along the continuum, our experts assess risks associated with pests that travel on and in the agricultural products we import and take action to protect U.S. agriculture and natural resources while keeping international trade and travel moving. This system of interlocking safeguards provides multiple points throughout the import process where we can effectively mitigate potentially harmful pests or diseases and facilitate the safe entry of U.S. agricultural imports, valued at **\$136.7 billion** in 2019.

The most effective way to keep foreign pests and diseases out of the country is to make sure they never have a chance to reach our shores. Starting overseas, APHIS' commodity preclearance programs span 23 countries and cover 68 different types of commodities. In fiscal year (FY) 2020, we inspected and cleared **5 billion** pounds of fresh fruits and vegetables and **952 million** plants and bulbs from **23** countries before they were shipped to the United States with zero pest detections at U.S. ports of entry. Additionally, APHIS inspected and certified **25** offshore facilities in **12** countries to support the safe trade of high-demand, large volume nursery imports. This work not only ensures that imported plants and plant products meet APHIS' import requirements and are free of pests of concern, but it also benefits importers whose inspected, pre-cleared, and certified products may pass through U.S. ports of entry without delay.

At U.S. ports of entry, CBP inspects international passenger baggage, cargo, and conveyances entering the country to make sure they meet APHIS' import requirements. Additionally, APHIS inspects imported plants for planting at 16 plant inspection stations across the United States. In

FY 2020, we cleared **179,522** imported shipments containing over **1.8 billion** plant units (cuttings, rooted plants, tissue culture, etc.) and nearly **723,000 kilograms** of woody plant seeds, intercepting **6,786** quarantine-significant pests. CBP inspected **4 million** international travelers' baggage, **338,768** passenger vehicles, **25,315** ships, and more than **1.4 million** cargo, mail, and express courier shipments, intercepting **56,653** pests.

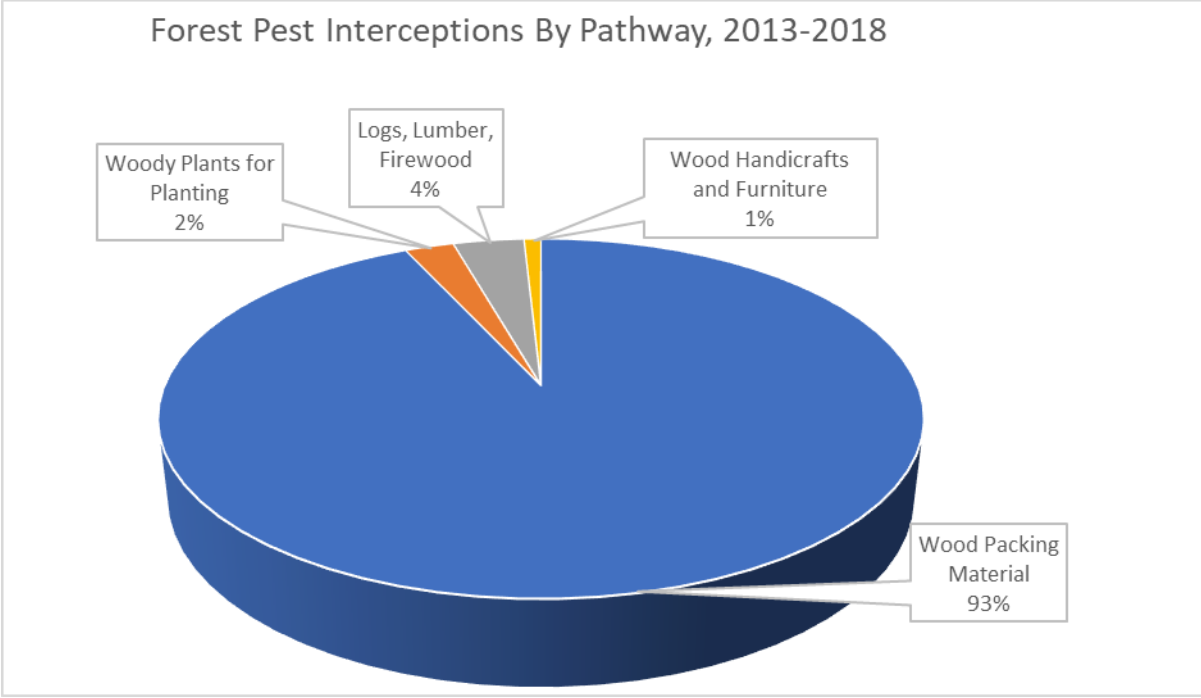
As global trade and travel increase so does the pressure of invasive pest and disease introductions. To keep ahead of the threat, APHIS continually applies the latest science and technologies to optimize risk management along the Safeguarding Continuum. In recent years, we:

- Developed an **offshore greenhouse certification program** that gives U.S. producers a faster, more reliable supply chain of healthy plant cuttings while protecting our country from harmful pests;
- Implemented **risk-based sampling** to focus port-of-entry inspections on higher-risk shipments that are more likely to have a pest problem;
- Started operationalizing the use of **molecular diagnostics** at our ports of entry to detect high-risk pests that physical inspection would miss;
- Established the “**not authorized pending pest risk analysis**” policy, which prohibits the importation of plant taxa until we are able to evaluate pest risk; and
- Moved toward standardized **systems approaches**, which greatly reduce pest risks.

These improvements are helping us to more effectively detect and intercept potentially harmful pests and protect U.S. agricultural and natural resources.

### **Geographic Sources of Intercepted Pests and the Commodities or Plant Species Most Often Associated with Infested Shipments**

There are four major import pathways through which forest pests could enter the United States: live woody plants; wood packaging material; logs, lumber, and firewood; and rustic furniture and handicrafts. Between 2013 and 2018, APHIS and CBP intercepted approximately 7,910 quarantine pests in these pathways. Of these, approximately **3,000** of the intercepted pests were forest pests. The pathway most often associated with forest pest interceptions was wood packaging material.



The highest numbers of forest pests were intercepted on shipments from Canada, China, and Mexico.

**Geographic source (in alphabetical order) of commodities with the highest number of pest interceptions from 2013 to 2018.**

<b>Woody Plants for Planting</b>	<b>Wood Packing Material</b>	<b>Logs, Lumber, Firewood</b>	<b>Wood Handicrafts and Furniture</b>
<b>Canada</b> <b>China</b> Costa Rica Dominican Republic Ecuador Guatemala Haiti India Indonesia Israel Jamaica <b>Mexico</b> Morocco Netherlands Thailand	<b>China</b> Costa Rica Czechia Ecuador France Germany Guatemala India Indonesia Italy <b>Mexico</b> Poland Romania Slovakia Turkey Ukraine Vietnam	Brazil Cameroon <b>Canada</b> Congo (DRC) Estonia Germany Guatemala Italy Mayotte <b>Mexico</b> Sudan	Cameroon <b>China</b> Haiti Indonesia Mexico Tanzania

CBP averages about **300** interceptions of wood boring and bark beetle species per year in wood packing material. These pests have high potential to damage forests. In 2002, the International Plant Protection Convention (IPPC) adopted International Standard for Phytosanitary Measures (ISPM) 15 to limit the spread of forest pests in wood packing materials. APHIS began phasing in enforcement of ISPM 15 in 2005. We require wood pallets, crates, boxes, dunnage, and other raw wood packing materials to be debarked, treated, and marked according to the specifications in the standard. Although there has been a significant reduction—as much as **52 percent** (Haack et al. 2014)—in the amount of infested wood packing material crossing U.S. borders since the implementation of ISPM 15, any pests found in this pathway could have significant consequences for U.S. forests.

### **Forest pest detections, new outbreaks, and the spread of existing infestations in the United States**

When populations of nonnative pests are detected in the United States, APHIS collaborates with Federal, State, Tribal, and local agencies and organizations to control, suppress, and when possible, eradicate them. In FY 2019, APHIS and cooperators conducted 411 surveys in 49 States, 5 territories, and the District of Columbia. These surveys targeted 365 pests of state and national concern, including exotic wood boring bark beetles. APHIS coordinated the response to 24 new or re-introduced species. In FY 2020, APHIS and cooperators conducted 433 surveys in 50 States and 3 territories, targeting 338 pests of state and national concern, including exotic wood boring bark beetles. APHIS coordinated the response to 38 new or re-introduced species.

The Forest Service’s Early Detection and Rapid Response (EDRR) program surveys natural, urban, and suburban forests around ports of entry that are not covered by the Cooperative Agricultural Pest Survey (CAPS) program. Since 2007, there have been more than 15 reports (published and some non-published) of nonnative insects and pathogens in the US affecting forests. Together, these programs help to create a profile of exotic plant pest distribution in the United States. Together, these programs help to create a profile of exotic plant pest distribution in the United States.

#### ***New Forest Pest Detections***

Since 2018, the Forest Service has detected two nonnative beetles and one fungus through EDRR. Upon further investigation, they determined that the fungus was widespread, leading APHIS to change the federal quarantine status of the pest. Further survey efforts after the beetle detections found no infestation or subsequent detections. APHIS has detected four new forest pests since 2018 through its national surveillance network:

- *Chlorophorus diadema*, Kokeshi, a longhorned beetle that we confirmed was associated with an imported shipment and not present in the environment.
- *Hylesinus varius*, an ash bark beetle that we confirmed was associated with an imported shipment and not present in the environment.
- *Lymantria umbrosa*, a species of gypsy moth that we confirmed in Washington and eradicated.

- *Taphrina polyspora*, a fungus that we later determined was widely distributed in the United States and not a pest of concern.

In all cases, none of the detections resulted in outbreaks.

### ***New Forest Pest Outbreaks***

There have been no outbreaks of new forest pests in the United States since 2014.

### ***Status of Existing Forest Pest Infestations***

APHIS operates official control or eradication programs for Asian gypsy moth, Asian longhorned beetle, European gypsy moth, European larch canker, spotted lanternfly, sudden oak death, and thousand cankers disease. We also help Federal and State agencies control or prevent the spread of other significant forest pests, including emerald ash borer, hemlock woolly adelgid, polyphagous shot hole borer, and rapid ohi'a death.

**Asian Gypsy Moth:** This species of gypsy moth is not known to occur in the United States. If it were to establish here, it could cause widespread damage to the U.S. landscape and natural resources. Between 2018 and 2020, APHIS and state partners have detected and eradicated three introductions of gypsy moth in Washington State. To prevent incursions of this pest, APHIS works with China, Japan, South Korea, and Russia to monitor pest population levels at ports in those countries and inspect ships and cargo headed for the United States before they leave Asia. At U.S. ports, CBP inspects ships and cargo to ensure they are free of Asian gypsy moth. APHIS also surveys areas around ports of entry to detect any possible introductions.

**Asian Longhorned Beetle:** This pest was first detected in Brooklyn, New York in 1996. Since then, the beetle has been found in New York, Illinois, New Jersey, Massachusetts, Ohio, and South Carolina. Working with State agencies, APHIS has eradicated this beetle from Illinois (2008), New Jersey (2013), southwestern Ohio (2018) and New York City (2019). Eradication work continues in Long Island, New York; Worcester County, Massachusetts; and Tate Township, Ohio. In May 2020, APHIS confirmed the detection of an Asian longhorned beetle population in Hollywood, South Carolina. We began delimiting surveys in coordination with Clemson's Department of Plant Industry in June. In November we established a 58-square-mile Federal quarantine area and began removing infested trees.

**European Gypsy Moth:** This pest was first detected in Massachusetts in 1869 and is currently found throughout the northeast quadrant of the United States. Since 2000, APHIS and the U.S. Forest Service have worked together to slow the spread of this pest to other parts of the country. Each year, we place approximately 80,000 traps along the leading edge of the infestation and in other at-risk locations around the country to detect and rapidly respond to introduction of European gypsy moth into new areas. In addition, we place thousands of traps as part of the port environs survey and Asian defoliator surveys through the CAPS Program. In 2019, to prevent the pest's movement from all parts of the State, APHIS expanded the European gypsy moth quarantine zone to include all of Maine.

**European Larch Canker:** European larch canker disease, caused by the fungus *Lachnellula (Dasyscypha) willkommii*, was first reported in North America in 1927. In areas where the disease is present, the fungus has infected and damaged 50 to 100 percent of the larch trees. Although the disease was eradicated from Massachusetts by 1965, new infestations were found in Canada in 1980 and Maine in 1983. APHIS and the Maine Department of Agriculture have effectively contained the disease inside the quarantined area since 1984.

**Spotted Lanternfly:** This pest, native to China, was first detected in Pennsylvania in September 2014. Today, spotted lanternfly populations have expanded to 30 counties in Pennsylvania and to several nearby states including Connecticut, Delaware, Maryland, New Jersey, New York, Ohio, Virginia, and West Virginia. Recent detections of single spotted lanternflies in Maine, Massachusetts, and New Hampshire underscore the ability of the pest to hitchhike to other parts of the country and the need for a coordinated effort to slow the spread of the pest. APHIS is working with its State cooperators to detect, contain, control, and suppress spotted lanternfly populations to safeguard agriculture and natural resources.

**Sudden Oak Death:** *Phytophthora ramorum*, a fungus-like water mold, causes several plant diseases, including *P. ramorum* leaf blight, *P. ramorum* dieback, *Phytophthora* canker diseases, and sudden oak death. First detected in the United States in 1995, *P. ramorum* is established in 16 counties in California and a small area in Curry County, Oregon. The most recent detection was in Del Norte County, California, in October 2020. APHIS and State partners have successfully controlled the disease and for more than 10 years kept it from impacting natural resources outside quarantined areas.

**Thousand Cankers Disease:** This disease is native to the western United States. However, its detection in four Eastern States (Pennsylvania, North Carolina, Tennessee, and Virginia) since 2010 raised concerns that it may threaten native black walnut populations in the eastern United States. Black walnut is considered a significant economic, social, and environmental resource. Although APHIS does not regulate the actual disease, we do regulate some of the disease's known pathways, including the importation of solid wood packaging and propagative material and the interstate movement of firewood.

**Emerald Ash Borer:** This wood-boring beetle is native to China and other parts of East Asia. It was first found in the United States in southeast Michigan in 2002, but we estimate that it probably entered the country in the 1990s. Since then, this pest has spread to 35 States and the District of Columbia. After several years of careful consideration and in consultation with stakeholders, APHIS issued a final rule to remove the emerald ash borer domestic quarantine in December 2020. Moving forward, APHIS will focus on biological control and integrated pest management to protect native ash species. To date, APHIS and partners have released parasitoid wasps in 30 States and Washington, D.C., to control emerald ash borer populations. We have successfully recovered wasp offspring in 22 States, demonstrating that the wasps are reproducing, becoming established in the areas where they were released, and, more importantly, attacking and killing the beetles.

**Hemlock Woolly Adelgid:** This aphid-like insect is native to Japan. Since it was first detected in Virginia in 1951, it has killed thousands of eastern hemlock trees in New England and along much of the eastern seaboard. APHIS is currently investigating the efficacy of different treatment options for controlling this pest. We are also supporting research to enhance early detection and rapid response efforts in threatened areas.

**Polyphagous Shot Hole Borer:** This ambrosia beetle is native to southeast Asia. When it bores into trees, it can introduce pathogenic fungi capable of causing Fusarium dieback, a disease that damages avocado and more than 39 other tree species. Polyphagous shot hole borer pest was first detected in Los Angeles County, California in 2003 but not properly identified until 2012. Today the pest is established in Los Angeles, Orange, Riverside, and Ventura Counties. Since 2013, APHIS has funded projects and supported research to develop survey and detection tools and biological control.

**Rapid ‘Ohi’a Death:** The fungal genus *Ceratocystis* causes disease on a wide variety of plants worldwide and for decades has been known to occur in Hawaii. In 2014, the Hawaii Department of Agriculture detected a new variant of the pathogen on the island of Hawaii killing ‘ohi’a lehua, the most common native tree in Hawaii. Rapid ‘ohi’a death now impacts nearly 180,000 acres of ‘ohi’a lehua forests on the island. Since 2018, Hawaii officials have also detected the disease on the islands of Kauai, Maui, and Oahu. Since 2017, APHIS has provided more than \$310,000 to support surveys and develop rapid response and disease-management protocols.

### **Collaboration Between the U.S. Department of Agriculture’s Animal and Plant Health Inspection and the U.S. Forest Service on Forest Pest Issues**

The U.S. Forest Service is responsible for responding to and managing threats to our Nation’s forests. APHIS uses its regulatory authority to help prevent the introduction and spread of pests capable of harming U.S. agriculture and natural resources, including our Nation’s forests. APHIS and the U.S. Forest Service collaborate regularly to identify and prioritize critical forest pest detection, surveillance, and eradication needs. For example:

- APHIS and the Forest Service have worked together since 2000 on the Slow the Spread program, which has reduced the European gypsy moth’s rate of spread by nearly **50 percent**.
- In 2007, we developed a memorandum of understanding that clarified each agency’s responsibility for assisting States in eradicating small, isolated European gypsy moth infestations on nonfederal lands.
- In 2020, we collaborated on writing the emerald ash borer program manual and biological control release guidelines.
- In 2011, APHIS, the Forest Service, the National Association of State Foresters, and the National Plant Board developed and signed the National Response Framework for Sudden Oak Death, which enhanced sudden oak death coordination and cooperation among local, State, and Federal agencies.
- Since 1992, APHIS and the Forest Service have worked on several pest risk assessments for wood imports, including logs, lumber and wood chips from Russia, New Zealand,

Australia, Mexico, and South America. These assessments have helped us develop effective regulatory approaches that prevent introductions of nonnative forest pests.

Additionally, the U.S. Forest Service implemented the EDRR program in 2007 to monitor for nonnative bark and ambrosia beetles in U.S. forests. The goal of the program was to survey one-third of U.S. states every year, resulting in a full survey of all 50 states every 3 years. The Forest Service established the program in coordination with APHIS' pest detection program to survey forest areas near ports of entry that had not been surveyed in APHIS' program.

### **Recommended Actions to Further Reduce the Rate of Forest Pest Arrivals in the United States**

Although the implementation and enforcement of ISPM 15 has significantly reduced the volume of infested wood packing material crossing U.S. borders, wood packing material still presents the greatest risk for introducing wood-boring pests into this country. To further mitigate risks in this pathway, APHIS will work with international organizations and trading partners to evaluate the effectiveness of the phytosanitary measures described in the standard and recommend new ones. We will continue to audit foreign facilities that produce wood packing material to verify compliance with ISPM 15. And, we will explore options for strengthening how we detect, investigate, and enforce ISPM 15 violations, especially against those who use counterfeit ISPM 15 stamps to bypass required treatments.

Woody plants for planting present some risk for introducing forest pests, but we have significantly reduced this risk through effective offshore clearance and certification programs. Today, most plants for planting are imported through an APHIS offshore or greenhouse certification program. We audit these programs yearly to ensure they meet our rigorous pest-exclusion requirements, and we subject imported plants to risk-based sampling upon entry to the United States. Over the past decade, we have also increased regulatory restrictions on live woody plants. We will continue to use the "not authorized pending pest risk assessment" policy and other permitting processes to ensure that, prior to entering the country, requests to import woody plants for planting meet our rigorous entry criteria. We will also continue to expand the availability of offshore certification programs that use rigorous systems approaches to manage plant pest risk. Additionally, we will continue to develop molecular tools for pest identification. Pathogens are more difficult to detect and identify than other types of quarantine pests. These tools will enable the rapid detection of viruses, phytoplasma, and bacteria in asymptomatic plants. Molecular identification would also help to reduce financial impacts on importers by preventing the destruction or re-export of commodities containing nonregulated pest species and allow for better targeting of pathways proven to contain high-risk pests.

### **Recommendations for Addressing Current Challenges with Detecting and Responding to Outbreaks of Tree and Wood Pests and Improving Compliance with the Plant Protection Act**

APHIS' funding for pest detection surveys has remained relatively flat since 2010. This limits the number and types of pest surveys that we can conduct and affects our ability to develop or improve detection tools and methodologies. Similarly, funding for the Forest Service's EDRR



for exotic wood borers has remained level for the past five years, and the number of states surveyed has remained at 10-12 each year. As a result, the number of states surveyed each year is 10 on average, due to funding constraints. Although the survey has not detected any new species of bark or ambrosia beetles since 2010, it is not clear whether that is because there are no beetle populations, or the species are not attracted to the lures used in the survey program.

To make the most of the funding we have, APHIS will continue working with our state partners and cooperators to focus surveys on those pests of greatest concern. We will also continue to prioritize our work with federal and state partners and university cooperators to research and develop more effective traps and lures for those pests that are more likely to harm agriculture and natural resources.