

Invasive Species and Forest Health

Over the last 200 years, several thousand foreign plant and animal species have become established in the United States. While not all introduced pests are problematic, scientists estimate that one in seven is invasive. An invasive species is a nonnative species whose introduction into the United States causes, or is likely to cause, economic or environmental damage or harm human health. If such a pest escapes detection upon entry into this country, several years typically lapse between arrival and discovery—time the pest spends getting established in the environment.

In today's global marketplace, the volume of international trade brings increased potential for the introduction of foreign pests and diseases that may threaten the health of U.S. forests and agricultural resources. Many of these invasive pests have seriously harmed urban and rural landscapes and have caused billions of dollars in revenue losses and cleanup costs in the millions.

Invasive species impact human health, the environment, and the economy of the Nation. Forest health and productivity are also at great risk as wildfire occurrences have been linked to increased invasive-species infestations. Economic impacts in the United States from invasive species are estimated by some scientists to exceed \$1 billion annually, in addition to negatively affecting hundreds of millions of acres of native ecosystems and associated native plants and animals.

The natural migration of nonnative agricultural and forest pests into the United States is uncommon. Most species get into the United States from foreign countries through the international movement of people, commodities, and their conveyances.

For example, the Asian longhorned beetle, first discovered in New York City in 1996, was most likely introduced on wood packaging material (WPM) from China. This beetle is a serious threat to hardwood trees and has no known natural predator in the United States. To inhibit this specific beetle and other similar forest pests from entering the United States, the U.S. Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) now requires that all WPM imported into the United States be heat treated or fumigated prior to departure from the exporting country.

APHIS also requires that each shipment be accompanied by a phytosanitary certificate, issued by the exporting country, verifying that the WPM has been treated.

National Invasive Species Council

On February 3, 1999, the President signed Executive Order 13112, requiring coordination and enhancement of Federal activities to control and minimize the economic, ecological, and human-health impacts caused by invasive species. That order also established the National Invasive Species Council (NISC) to coordinate the activities of the various Federal departments and agencies dealing with invasive species in the United States. NISC was tasked with facilitating an overall Federal strategy for minimizing the impact of invasive species. NISC members produced a management plan to improve coordination, prevention, control, and management of invasive species. More information can be found on the NISC Web site at <<http://www.invasivespecies.gov>>.

APHIS' Role: Prevention, Detection, and Response

This Executive Order and the National Invasive Species Management Plan support the mission of USDA-APHIS to prevent new pests and diseases from becoming established in the United States.

APHIS focuses on reducing pest risks to the United States, making certain that agricultural products entering the country do not carry invasive pests, conducting aggressive domestic surveillance programs, and ensuring robust emergency response capabilities in the event of a significant pest introduction.

APHIS' Offshore Pest Information Program (OPIP) performs the essential function of collecting, assessing, and reporting relevant pest and disease information from foreign countries. OPIP work is done by APHIS safeguarding officers stationed overseas. These officers gather critical pest information and monitor trade trends. They look for any changes in production, processing, and shipping practices that could increase the risk of pest introductions into the United States. That information assists in making policy decisions, such as where risk assessments should focus, when to modify port-of-entry inspection, when to initiate rulemaking for certain commodities, and what pests APHIS should be surveying for at home.

As a means to combat many invasive species, organisms such as insects, fish, snails, plant pathogens, and nematodes are intentionally imported into this country to help provide natural control. Because some of these organisms can themselves be harmful, APHIS manages a permitting system to assess the potential risk they pose to plants, animals, and the environment. APHIS has biological scientists skilled in making the necessary risk assessments before such organisms are allowed into this country.

In addition to import permits, APHIS requires shipments of approved imported commodities to be accompanied by official sanitary or phytosanitary certification, which indicates that any pest or disease risk has been sufficiently mitigated. APHIS also requires that certain approved commodities undergo and pass preclearance inspection in the country of origin before being shipped to the United States. APHIS may also require that commodities undergo treatment—such as fumigation or temperature treatments—and/or mandatory quarantine prior to being allowed entry into the United States.

Once they have passed through these overlapping offshore protections, shipments must be cleared upon arrival in the United States. In March 2003, responsibility for port inspections of agricultural commodities transferred from USDA to the U.S. Department of Homeland Security's (DHS) Customs and Border Protection (CBP). CBP has 1,800 agricultural specialists dedicated to inspecting agricultural commodities and other products that may be harboring pests and diseases. Under the legislation that created DHS, APHIS maintained the responsibility for establishing the regulations and guidelines that govern the import of agricultural and forest products, and CBP became responsible for conducting the actual inspections at the ports.

APHIS recognizes that there is also risk posed by smuggled or improperly imported agricultural products and uses its Smuggling Interdiction and Trade Compliance (SITC) officers to address this vulnerability. APHIS' SITC program is responsible for intelligence-gathering and other antismuggling activities, such as secondary market and warehouse inspections, that help prevent animal and plant pests and diseases from entering the United States. When SITC personnel identify a smuggled product, they not only remove it from the market but also conduct a full investigation to identify and eliminate any illegal pathways at their source.

APHIS has a strong domestic surveillance infrastructure in place to detect any pests that could slip past its prevention measures. The agency utilizes a nationwide system of experts to track plant pests of concern. The Cooperative Agricultural Pest Survey (CAPS) is a pest-surveillance program managed cooperatively by APHIS and State departments of

agriculture, as well as universities, industry groups, and natural-resource protection organizations.

The primary function of the program is to survey, identify, and monitor pests of concern to U.S. agriculture and the environment. Located in all 50 States and three Territories, CAPS program personnel track more than 400 pests of concern in both rural and urban sites nationwide.

In conjunction with APHIS' prevention and surveillance efforts, the agency acknowledges the absolute necessity of being able to respond swiftly and in a coordinated manner should a serious pest or disease be detected. APHIS has the authority under the Plant Protection Act and the ability to respond quickly and effectively to identify new pests. In addition, APHIS has specific emergency response guidelines for many of the invasive pests and diseases that pose a significant threat to the United States. APHIS has developed these response plans in conjunction with its Federal, State, and local partners and conducted exercises to test such preparedness. To ensure maximum speed and effectiveness, APHIS has rapid-response teams stationed around the country ready to travel to detection sites to coordinate Federal containment and eradication efforts.

Examples of Invasive Forest Pests in the United States

Both natural ecosystems and those modified for agriculture and forestry are vulnerable to invasive pests. APHIS protects not only agriculture but also forest, rangeland, and wetland ecosystems. APHIS works closely with USDA's Forest Service (FS) and the U.S. Department of the Interior's Bureau of Land Management, National Park Service, and U.S. Fish and Wildlife Service.

APHIS and the FS set the foundation for cooperative work many years ago to slow the spread of the gypsy moth and continue to work together on controlling and eradicating other invasive forest pests. The following examples illustrate the range of threats to forest health that APHIS, FS, and their partners are currently facing.

Asian Longhorned Beetle

The Asian longhorned beetle is a serious threat to hardwood trees and has no known predators here. It has been detected in New York, Chicago, New Jersey, and in warehouses in several other U.S. cities. APHIS recently deregulated this pest in Chicago, and control activities in New York and New Jersey are proceeding. If the ALB were to expand beyond quarantined areas, it has the potential to wreak havoc nationwide, affecting such industries as lumber, maple syrup, nursery, and tourism and costing more than \$41 billion in losses. APHIS has implemented new regulations for incoming solid WPM that will minimize the likelihood

of the Asian longhorned beetle's being re-introduced into the United States in the future.

Emerald Ash Borer

In July 2002, the emerald ash borer (EAB) was discovered to be killing thousands of ash trees in south-eastern Michigan. Evidence suggests that the beetle first entered Michigan from China at least 10 years ago, presumably from solid WPM or dunnage used to transport manufactured goods. The EAB was subsequently found in Ontario, Canada, and the States of Ohio, Indiana, Illinois, and Maryland. This pest spreads naturally by flying and through the transport of infested ash firewood, logs, lumber, and nursery stock.

To limit human-assisted spread from currently infested areas, strict regulations are imposed on the transport of ash trees and ash wood products from those areas. In addition, national quarantines were imposed by USDA-APHIS and the Canadian Food Inspection Agency. Today, APHIS continues to focus on the critical mission of detection, control, and eradication. Regulatory and education and outreach activities are critical and offer the greatest opportunity to impact program outcomes while ongoing efforts from the EAB National Science Panel promise that more effective treatments and tools will eventually be available to combat EAB. USDA's FS estimates that EAB, if not contained or eradicated, has the potential to cost State and local governments and landowners approximately \$7 billion over the next 25 years to remove and replace dead and dying ash trees in urban and suburban areas.

Phytophthora ramorum

P. ramorum—the fungus that causes sudden oak death—was first reported in 1995 in the woodland environment in central coastal California. The pathogen has a broad range of hosts, including hardwoods, softwoods, nursery plants, and shrubs. During the spring of 2004, the California Department of Food and Agriculture confirmed the presence of *P. ramorum* in two large wholesale production nurseries. Investigations and shipping records revealed that these nurseries had shipped large quantities of several common household plant varieties nationwide.

Through ongoing surveys of nurseries, APHIS continues to define the extent of the pathogen's distribution in the United States and limit its artificial spread beyond infected areas through quarantine and a public education program. APHIS regulations were published on February 14, 2002, to control the movement of *P. ramorum* from 12 infested counties in California and an area under eradication in Oregon.

A national survey is underway. Research being conducted by universities, USDA's Agricultural Research Service and FS, and other scientists is aimed at better identifying hosts, methods of detection, and effective treatments. The potential threat to the commercial timber industry could exceed \$30 billion if *P. ramorum* became established in Eastern deciduous forests.

Sirex noctilio

Sirex noctilio, an exotic woodwasp, was detected in New York in 2004 through APHIS' CAPS program. This pest has the potential to cause severe damage to North American pine forests, especially if it reaches the South. Scientists estimate that *S. noctilio* can spread at least 25 miles per year naturally. Twenty-four counties in upstate New York and two counties in Pennsylvania have positively confirmed the presence of this pest. APHIS and its cooperators are currently evaluating long-term options for mitigating this situation. In other countries where *S. noctilio* has been inadvertently introduced, scientists have identified a promising biological control agent for use against this pest. In support of the potential future biological-control program, APHIS is preparing a biological assessment and an ecological assessment. Although the potential impact of *S. noctilio* on U.S. forests is unknown, there is concern that it could cause substantial economic loss.

Gypsy Moth

Introduced in Massachusetts in 1869, the European gypsy moth is a highly destructive insect of hardwood trees. Gypsy moths feed on the leaves of more than 500 species of trees and shrubs. APHIS' goal is to define the extent of the gypsy moth infestation and limit its artificial spread beyond the infested area through quarantine and an active regulatory program, including spot eradications. APHIS' gypsy moth program regulates the movement of gypsy moth host-material from infested areas to other parts of the United States. This program is an extremely effective APHIS-FS-State partnership that prevents the establishment of gypsy moth in areas of the United States that are not contiguous to currently regulated infested areas. The Asian gypsy moth, which is very similar to the European gypsy moth, also poses a major threat to forest habitats in North America.

Additional Information

For more information on invasive species, please visit APHIS' Plant Protection and Quarantine Web site at <http://www.aphis.usda.gov/ppq> or USDA's FS Web site at <http://www.fs.fed.us/foresthealth>.

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