



Top Seven Invasive Pests to Watch

IOWA'S FORESTS, COMMUNITIES, WOOD INDUSTRY & ECONOMY



Executive Summary

Iowa's forests are a vital part of the state's environmental, economic, and community health, covering three million acres that support clean air, water quality, and wildlife habitats. These forests also contribute significantly to the economy, with the wood products industry employing over 18,000 Iowans and generating nearly \$4 billion in annual sales. However, this invaluable resource faces severe threats from invasive species, diseases, and environmental stressors that could drastically reduce forest cover and biodiversity in both rural woodlands and urban settings.



The Iowa Department of Natural Resources (DNR) Forestry Section has identified seven primary threats to Iowa's forests: the spongy moth, emerald ash borer, bur oak blight, thousand cankers disease, Asian longhorned beetle, spotted lanternfly, and round leaf bittersweet. These pests could impact the health of millions of trees, endangering 26 million community trees and 6 billion board feet of timber volume across the state. The projected economic losses from these threats include \$1.4 billion for forest landowners and wood products businesses and an estimated \$20 billion in urban tree removal and replacement costs over the next 20 years.



To counter these threats, the DNR emphasizes proactive forest and tree management and monitoring practices. Maintaining species diversity and healthy tree density are essential for resilience against pest outbreaks. Communities are encouraged to conduct tree inventories and create diverse urban forests with no more than 10% of any single species. These steps, along with ongoing monitoring, public awareness, and coordinated action, are critical to safeguarding Iowa's forest ecosystems and the economic benefits they provide.



Spongy Moth

Lymantria dispar

BACKGROUND

Spongy Moth is a European insect species introduced in Boston, MA in 1869 as an experiment to help provide silk for the textile industry. This exotic insect continues to spread west from that introduction site and defoliate native forests.

Establishment of spongy moth in Iowa will affect the survival of mature trees. The larvae of this insect will feed on the leaves of over 300 host species during the important summer growing season, a time when a trees leaves are converting sunlight to energy. Repeated defoliation that occurs several years in a row on the same tree will deplete the stored nutrients, leading to the decline of that tree.



ECONOMIC IMPACTS

- The total estimated impact of Spongy Moth to Iowa’s forest landowners and wood products businesses is over \$551 million or an annualized loss of over \$22 million in perpetuity for Iowa’s economy.
- Other economic losses include non-timber products like seed production, reduced wildlife habitat and a \$6.8 billion loss of community tree derived benefits such as energy savings, property value, storm water retention, carbon sequestration and tree removal and replacement costs. Communities and homeowners will bear the cost burden of removing dead trees caused by spongy moth.
- The loss of oaks and other preferred tree species of spongy moth will negatively impact the economic contribution of \$1.5 billion that fish and wildlife recreation provides to Iowa’s economy.

WILDLIFE IMPACTS

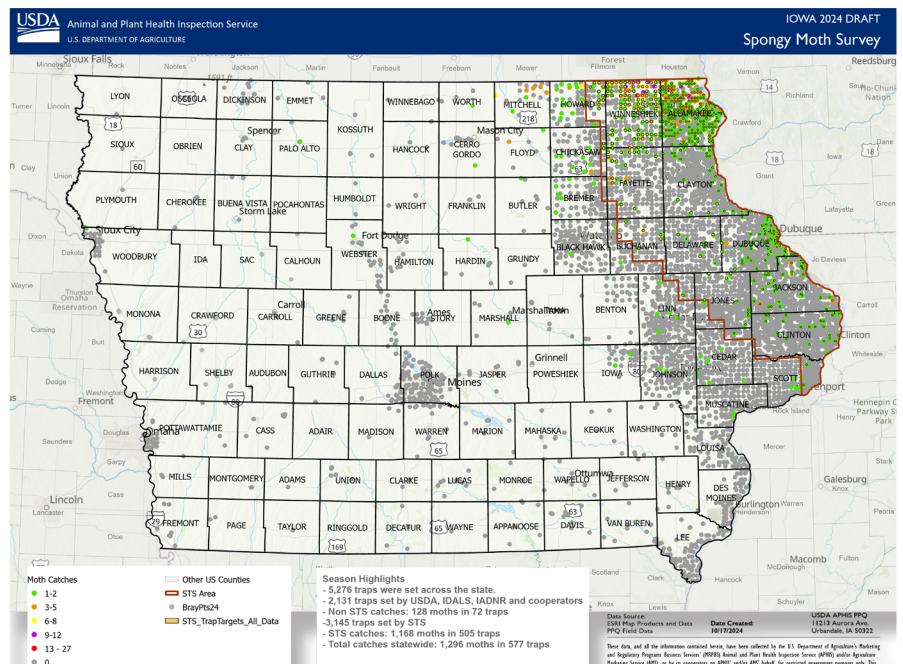
Oak leaves are a preferred food source for spongy moth caterpillars. Acorns produced by oaks are eaten by many species of birds and mammals. A reduction in the number of oak trees in Iowa’s forests caused by repeated defoliation from spongy moth caterpillars will affect a wide variety of game and non-game species of wildlife. A primary fall and winter food for deer is acorns, composing around 54 percent of a deer’s yearly diet during years acorn seed is available—otherwise the next preference is corn.



Above: The predicted look oak trees in Iowa will have during the early summer after dispar moth caterpillars consume all of the leaves.

MANAGEMENT SOLUTION

Proper woodland and community tree management have a critical role in creating healthy trees. The best insurance policy a landowner can have when managing their woodlands is by maintaining a diversity of tree species; while ensuring an appropriate number of trees are growing on each acre. The best course of action for communities is to have a tree inventory and a community tree resource plan. Good woodland and tree care under the direction of a forester or an arborist is the best defense against all forest health threats.



Emerald Ash Borer

Agrilus planipennis

BACKGROUND

Emerald ash borer (EAB; *Agrilus planipennis*) is a small, green, invasive, wood boring beetle that attacks and kills ash trees. The adults live on the outside of ash trees feeding on the leaves during the summer months. The larvae look similar to white grubs and feed on the living plant tissue (phloem and cambium) underneath the bark of ash trees. The trees are killed by the tunneling activity of the larval under the tree's bark, which disrupts the vascular flow.



EAB is a highly invasive forest pest that has the potential to kill nearly 100 percent of the native ash trees of any size, age, or stage of health where it is present. Over 50 million ash trees outside of Iowa have been killed where EAB is present. Much of Iowa's forestland is populated with ash trees, and Iowa's community street trees are heavily planted with ash cultivars. The US Forest Service 2012 inventory indicates that there are 52 million woodland ash trees and 3.1 million urban ash trees in Iowa. Trees attacked by EAB can die within two years.

ECONOMIC IMPACTS

- The total impact of emerald ash borer to Iowa's forest landowners and wood products businesses is over \$27 million or an annualized loss of \$1 million in perpetuity for Iowa's economy.
- Other economic losses include non-timber products such as reduced wildlife habitat and an over \$4.1 billion loss of community tree derived benefits such as energy savings, property value, storm water retention, carbon sequestration and tree removal and replacement costs. Communities and homeowners will bear the cost burden of removing dead trees caused by EAB.

WILDLIFE IMPACTS

Ash has moderate importance to wildlife as a food source. Seeds are known to be eaten by wood ducks, finches, and cardinals.

MANAGEMENT SOLUTION

Proper woodland and community tree management have a critical role in creating healthy trees. The best insurance policy a landowner can have when managing their woodlands is by maintaining a diversity of tree species; while ensuring an appropriate number of trees are growing on each acre. To effectively safeguard community forests, establishing a comprehensive tree inventory and developing a community tree resource plan are essential steps. Guided by a professional forester or certified arborist, proactive and attentive woodland and tree care offer the strongest defense against forest health threats. Addressing specific threats like the emerald ash borer requires a strategy to remove or treat infested ash trees and prioritize replanting diverse, resilient species to ensure long-term forest health and resilience.



Walnut Twig Beetle

Pityophthorus juglandis

BACKGROUND

Since the 1990's, black walnut has been dying in Western U.S. The deaths are caused by a walnut twig beetle (WTB) that carries a fungus (*Geosmithia morbida*) which is spread as the beetle tunnels through tree tissues. The insect disease complex had been named thousand cankers disease (TCD). TCD is a threat to eastern black walnut trees, but recent research suggests that it's not as serious as initially feared. The primary threat would be the damage caused by the walnut twig beetle (WTB)

The introduction of WTB into Iowa would have disastrous effects economically to the wood industry in the state and the rest of the nation. Iowa has the third largest volume (979 million board feet) of saw log size black walnut in the world. Some experts believe that the Walnut Twig Beetle (WTB) poses a significant threat to the health of black walnut trees and may ultimately reduce the market value of this valuable species.

ECONOMIC IMPACTS

- The estimated total impact of WTB to Iowa's forest landowner and wood products businesses is more than \$547 million or an annualized loss of \$43 million in perpetuity for Iowa's economy.
- Other economic losses would include non-timber products like nut production, reduced wildlife habitat and a \$1.3 billion loss of community tree derived benefits such as energy savings, property value, storm water retention, carbon sequestration and tree removal and replacement costs. Communities and homeowners will bear the cost burden of removing dead trees caused by WTB.

WILDLIFE IMPACTS

Black walnut has moderate importance to wildlife as a food source. Seeds are eaten by woodpeckers, foxes, and squirrels.

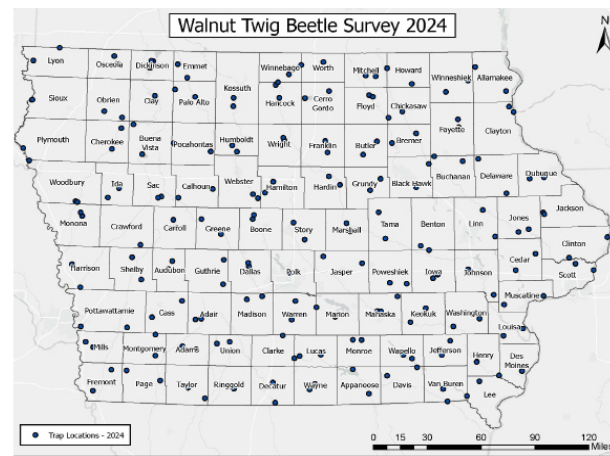
MANAGEMENT SOLUTION

Proper woodland and community tree management have a critical role in creating healthy trees. The best insurance policy a landowner can have when managing their woodlands is by maintaining a diversity of tree species; while ensuring an appropriate number of trees are growing on each acre. The best course of action for communities is to have a tree inventory and a community tree resource plan. Good woodland and tree care under the direction of a forester or an arborist is the best defense against all forest health threats.



Above: The black walnut is Iowa's most economically important tree species

Below: The walnut twig beetle and the galleries they leave behind under the bark of large branches



Asian Longhorned Beetle

Anoplophora glabripennis

BACKGROUND

Asian Longhorned Beetle (ALB) is an exotic pest native to China. The larva of this beetle kills trees by tunneling through the tree, which girdles stems and branches.

ALB most likely traveled to the United States inside wood packaging materials from China, and has been intercepted at various ports of entry and warehouses throughout the country. In the United States the beetle prefers to attack maple species (*Acer* spp.), such as: boxelder, sugar, Norway, silver and red maple. In high concentrations or if there is not enough maple present they will also attack birch, elm, horsechestnut, and Ohio buckeye. It occasionally attacks: ash, London planetree, mimosa, poplar, and European mountain ash.

Maple, the beetle's host of choice, is a tree extremely common in urban settings. An infestation of ALB would be devastating for many communities throughout Iowa. However, with monitoring ALB can be detected early and eradicated.

ECONOMIC IMPACTS

- The total economic impacts of ALB to Iowa's forest landowners and wood products industry is over \$222 million.
- Other economic losses would include non-timber products such as reduced wildlife habitat as well as a cost of nearly \$13 billion to communities in lost benefits like energy savings, property value, storm water retention, and carbon sequestration. Communities and homeowners will bear the brunt of the cost burden for removing dead trees cause by ALB.

WILDLIFE IMPACTS

Maple trees have moderate importance to wildlife as cover and food. Seeds are eaten by birds and small mammals and the buds are eaten by birds, squirrels and deer. The trees are used for nesting sites by many birds.

MANAGEMENT SOLUTIONS

Proper woodland and community tree management have a critical role in creating healthy trees. The best insurance a landowner can have when managing their woodlands is to maintain a diversity of tree species; while ensuring an appropriate number of trees are growing on each acre. The best management plan for communities is to create diversity by not having more than 10 percent of any one species represented. These simple management plans provide the best defense against emerging forest health threats.

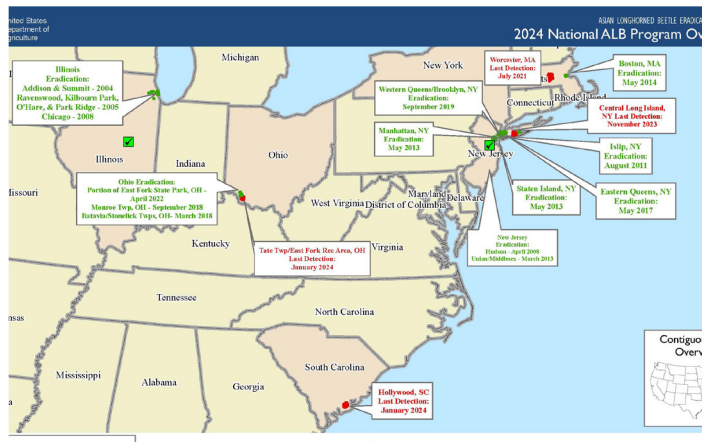


Above: An urban street devastated by ALB.

Below: This map shows states with quarantines active infestations and blue dots are areas where ALB has been eradicated

Images:

- Dean Morewood, Health Canada, Bugwood.org
- Michael T. Smith, Bugwood.org
- ALB infestation map [map]. "United States Department of Agriculture Animal and Plant Health Inspection Service". <<http://beetlebusters.info/>> (Accessed September 05, 2012).



Spotted Lanternfly

Lycorma delicatula

BACKGROUND

The Spotted Lanternfly (*Lycorma delicatula*) is an invasive plant hopper that is native to China and likely arrived in North America hidden on goods imported from Asia. Juvenile spotted lanternflies, known as nymphs, and adults prefer to feed on the invasive tree of heaven (*Ailanthus altissima*) but also feed on a wide range of crops and plants, including grapes, apples, hops, walnuts and hardwood trees. The insects suck sap from stems and branches which can weaken and damage the plant. This feeding also leaves behind a sticky, sugary residue called honeydew that attracts other insects and promotes the growth of sooty mold, which can further damage the plant.

ECONOMIC IMPACTS

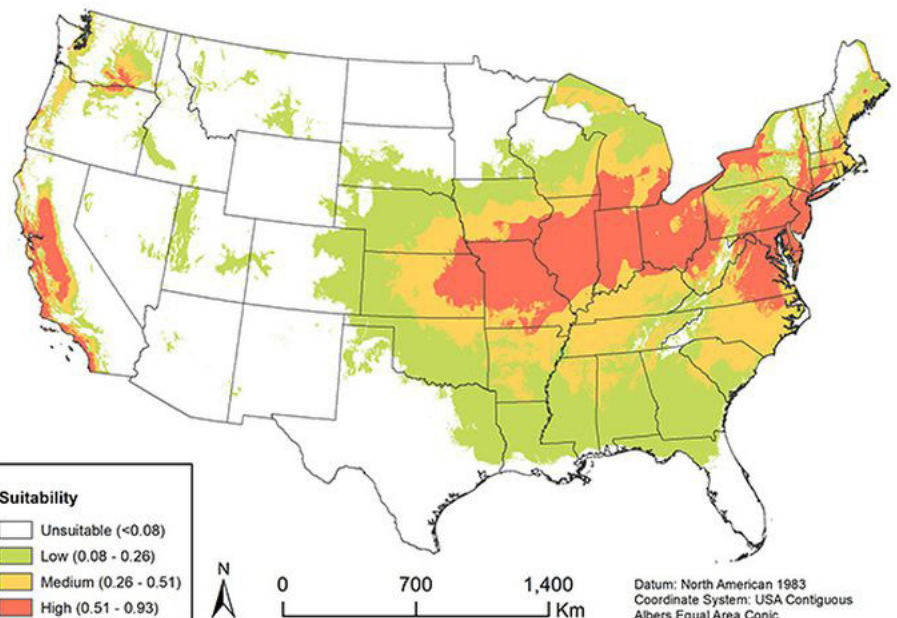
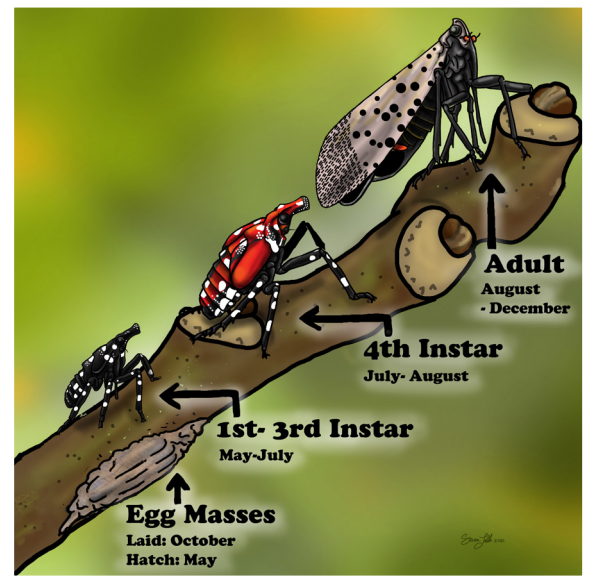
- The economic impacts of the Spotted Lanternfly (SPLF) on forests are uncertain. However, it is expected to pose a more significant threat to fruit trees and grapevines.

WILDLIFE IMPACTS

The spotted lanternfly uses its piercing-sucking mouthpart to feed on sap from over 70 different plant species. It has a strong preference for economically important plants including grapevines, maple trees, black walnut, birch, willow, and other trees. The feeding damage significantly stresses the plants which can lead to decreased health and potentially death.

MANAGEMENT SOLUTIONS

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Images:

- Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org
- Lalk, S. (2021) Spotted lanternfly lifecycle. Clemson University
- Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

Round Leaf Bittersweet

Celastrus orbiculatus

BACKGROUND

Round leaf bittersweet, a woody vine native to East Asia, was introduced to North America in the mid-19th century as an ornamental plant. Known for its hardiness and vibrant fruit, it has since spread extensively across temperate regions of the eastern United States and Canada. Its aggressive growth habit allows it to outcompete native plants, posing a substantial threat to native ecosystems.

ECONOMIC IMPACTS

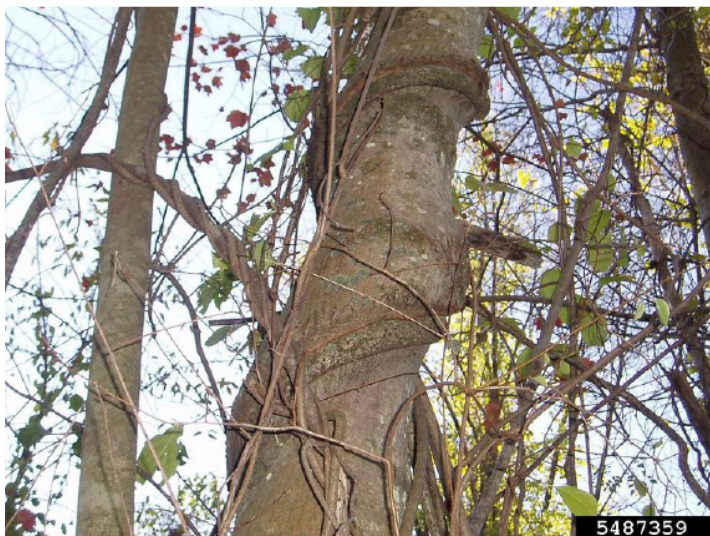
This invasive vine can completely overtake low-growing vegetation, using its dense growth to shade and outcompete other plants, ultimately killing them by breaking or girdling their stems. As it spreads, round leaf bittersweet can encircle mature trees, cutting off their nutrient flow and leading to tree death. In winter, the added weight of snow and ice on its vines often causes further breakage, damaging trees and increasing maintenance costs.

WILDLIFE IMPACTS

The extensive growth of round leaf bittersweet disrupts native plant communities, displacing important native species like American bittersweet. The vine's smothering growth can negatively impact bird and insect populations by reducing native food and habitat resources. Over time, the loss of native plant diversity also disrupts the larger ecosystem, affecting wildlife reliant on these plants for food, shelter, and nesting.

MANAGEMENT SOLUTIONS

Effective management of round leaf bittersweet requires vigilant monitoring and prompt control measures. Preventive actions include avoiding planting this species and refraining from using its fruit in decorative arrangements. For existing infestations, early intervention through regular mechanical removal or herbicide treatments can help reduce its spread. Hiring a consulting forester or arborist can aid in the safe and effective application of control methods. Persistent, repeated efforts are essential to prevent seed spread and restore impacted areas with native species.



Images:

- Leslie J. Mehrhoff, University of Connecticut, Bugwood.org
- Richard Gardner, Bugwood.org

Useful Links

Iowa DNR Forestry Section forest health page. <http://www.iowadnr.gov/Environment/Forestry/ForestHealth.aspx>

Iowa DNR Emerald Ash Borer Resource page. <http://www.iowadnr.gov/EAB>

Iowa DNR Urban Forestry page. <http://www.iowadnr.gov/Environment/Forestry/UrbanForestry.aspx>

Iowa DNR landowner assistance web page. <http://www.iowadnr.gov/Environment/Forestry/ForestryLandownerAssistance.aspx>

Iowa Department of Agriculture and Land Stewardship Tree Health page. <http://iowatreepests.com/>

Iowa State University's Pest Management and the Environment page host information on emerald ash borer, gypsy moth and more <http://www.extension.iastate.edu/pme/>

The Iowa State University Plant Disease Clinic. Contact phone number 515-294-0581 or on the web at <http://www.extension.iastate.edu/Pages/plantpath/pdcintro.html>

Iowa State University Extension Entomology. Contact phone number 515-294-1101 or on the web at <http://www.ent.iastate.edu/clinic/>

Iowa State University Bur Oak Blight page. <http://www.public.iastate.edu/~tcharrin/BOB.html>

Iowa DNR website at <http://www.iowadnr.gov/>

National Invasive Species Information Center- www.invasivespeciesinfo.gov

Emerald Ash Borer General Information - www.emeraldashborer.info

General Pest Information - www.aphis.usda.gov



**Department of
Natural Resources**

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