

The Woodland Steward

Promoting the Wise Use of Indiana's Forest Resources

Spotted Lanternfly Found in Indiana

In July 2021, a population of spotted lanternfly (*Lycorma delicatula*) was identified in Switzerland County, Indiana near the Ohio River. DEPP and USDA are conducting surveys to ascertain the extent and source of the infestation as well as determine what management strategies will be implemented.

Spotted lanternfly is a major pest of concern across most of the United States. This insect is native to China and parts of India, Vietnam, Japan and Taiwan. It was first identified as an invasive species in 2004 in South Korea and is now a major pest there. Spotted lanternfly was first detected in the United States in Pennsylvania in 2014.

Identification and biology

This insect is a planthopper with a distinctive wing pattern. Wings are held downward and folded when the insect is at rest. The forewings, which are visible in the resting position, are greyish with black spots and the wing tips show a network of veins. Part of the hind wings is red with black spots and the remainder is white and black. Adults are approximately one inch long from the head to the end of the folded wings. The abdomen is yellowish with black bands. Adults may not be seen flying (as they are weak flyers) but will likely be seen hopping or crawling.

Brownish-yellow seed-like eggs are laid in masses of 30-50. Eggs are laid in four to seven columns approximately an inch long and covered with a whitish gray waxy layer. As it ages, the waxy layer turns grayish brown and has the appearance of cracked mud.



Figure 1. Adult Spotted Lanternfly resting on the bark of a tree of heaven Vevay, Indiana. Photo taken by Ren Hall (DEPP).



Figure 2. Egg mass of SLF on branch of tree of heaven in Vevay, IN. Photo Taken by Angela Rust (DEPP).

Nymphs emerge in April or May and have four instars or growth stages. The first three instars are black with white spots. The fourth instar retains the white spots but has a red and black body with red wing pads. The first to fourth instar ranges in size from a 1/8 of an inch to a little over a half inch long.

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Calendar of Events

August 27-29

Hoosier Hardwood Festival
Marion County Fairgrounds
See www.hoosierhardwoodfestival.com

September 2

Tree & Plant Identification
Lake Village, Newton County
RSVP & info (219) 285-2217,
newtonsoilwater@gmail.com

September 11

Invasive Plant Control Training for Landowners
9 am – 4 pm
Southern Indiana Purdue Ag Center, Dubois County
Register at 812-678-5049 or ronr@purdue.edu

September 11

IFWOA Regional Forestry Field Day North
Albion, Noble County
See more at www.ifwoa.org/events

September 18

IFWOA Regional Forestry Field Day Central
See more at www.ifwoa.org/events

September 25

National Public Lands Day
Volunteer to take care of your public lands on several public properties, including the Hoosier National Forest. Contact Marion Mason, 812-277-6877 if interested in volunteering or learn more about volunteering.

October 7

Tree Planting & Care Workshop
North Newton High School, Newton County
RSVP & info at (219) 285-2217,
newtonsoilwater@gmail.com

October 9

IFWOA Regional Forestry Field Day Southwest
See more at www.ifwoa.org/events

October 16

IFWOA Regional Forestry Field Day Southeast
See more at www.ifwoa.org/events

Ongoing

Upcoming local invasive species management events in your area: See <https://www.entm.purdue.edu/iisc/> for times, locations, contact info.

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Spotted Lanternfly Found in Indiana *Continued from page 1*



Figure 3. Red immature stage of SLF (fourth instar) feeding on leaves of tree of heaven in Vevay, IN. Photo taken by Ren Hall (DEPP).

The nymphs will climb into trees shortly after they emerge. They will drop off the trees when they encounter a physical obstacle or disturbance from the wind and start climbing up again. Fourth instar nymphs develop into adults in late June or early July. Adults continue to feed on plant tissues. Mating and egg deposition begin in September and continue until a hard frost.

Spotted lanternfly overwinters as an egg on the bark of trees, firewood, rocks, outdoor furniture, equipment, vehicles, or anything that is stored outside. This is especially a risk for items outside during that egg laying period. There is one generation per year.

Why is spotted lanternfly a problem?

Adults and nymphs have piercing-sucking mouthparts and feed on the vascular tissue of leaves, petioles, young shoots, branches and trunks of its hosts. Adults and older nymphs may feed in large populations. This extensive feeding results in oozing wounds on woody tissue and wilting and death of branches.

The spotted lanternfly can be spread long distances by people who move infested material. If allowed to spread, this pest could have serious impact on the grape, hops, orchard and logging industries in the United States.

The spotted lanternfly has a recorded host list of over 100 species, primarily woody species. Their preferred host is tree of heaven (*Ailanthus altissima*) which is a common invasive species in Indiana.

How to monitor

Inspection of areas and objects near tree of heaven should be a priority since this is a preferred host tree. Smooth surfaces are preferred for egg laying and eggs may be in sheltered locations or in crevices on trees or outdoor objects. Nymphs and adults tend to cluster at the base of trees or lower trunk during the day and are more active at dusk or early evening. Infested trees can show significant deposits of honeydew and sooty mold around the base of the tree to the point where the base and surrounding ground may appear black. Tree sap oozing from wounds on trees and the honeydew may attract ants, bees and wasps.

Inspection of articles such as logs, firewood, other tree parts, decorative grapevines, any outdoor household articles and vehicles coming from infested areas will assist in reducing the spread of this invasive pest long distances.

Reporting

Suspected finds spotted lanternfly should be reported to the Indiana Department of Natural Resources. Call 866-NO EXOTIC (866-663-9684) or email DEPP@dnr.IN.gov. Please leave your name, contact number and detailed information about what you are reporting. Photos are always appreciated. By notifying us of a potential pest problem you provide an invaluable service to the DNR and our natural resources.

This article was adapted from the Indiana DNR Division of Entomology and Plant Pathology, <https://www.in.gov/dnr/entomology/pests-of-concern/spotted-lanternfly/>.



Figure 4. Sooty mold of SLF on branch of tree of heaven in Vevay, IN. Photo Taken by Angela Rust (DEPP).

The 17-Year Cicada Emergence is Wrapped up: Now what?

Elizabeth Barnes

Cicada screams may be dying down for another 17-years, but there are still some lingering effects on the ecosystem from these insects. Periodical cicadas (aka 17-year cicadas) feed underground for most of their lives drinking sap from tree roots. Once every 17 years they emerge *en masse*, climb up trees, sing, mate, and lay their eggs on the tips of tree branches. This cycle is completely natural and has a long history in written and oral records. Cicadas are not harmful to humans, provide a feast for wildlife, and mostly only cause cosmetic injury to trees.

Cicada Biology

To understand the impact of 17-year cicadas (Brood X) on the forest, you first need to understand their lifecycle. These cicadas spend most of their life underground in their nymphal stage (juvenile stage) feeding on tree roots. They drink xylem from the roots using their straw-like mouthparts. There is little evidence that the nymphs do any serious damage to trees during this period. Most native trees are adapted to the cicadas and studies have found little to no reduction in their growth from this feeding. During this life stage, cicadas may burrow in the soil but rarely travel more than 1 meter.

Once they reach their 17th year, the nymphs will crawl closer to the surface of the soil and form tunnels often with mud “chimneys” on top. They wait there until the conditions are just right (64 degrees F). When they emerge, they look for a sturdy vertical surface to crawl up and will cling to it while they shed their skin. This stage is the most vulnerable part of the cicada’s life. If they don’t find a good location to molt or if they get knocked off before their skin has hardened, they can be seriously damaged.

Adult 17-year cicadas live for about a month and spend most of that time looking for a mate. The loud buzzing noise commonly associated with them is their courtship song. Once they’ve mated, the female cicadas begin laying their eggs in twigs of deciduous trees. The structure they use to lay their eggs, the ovipositor, is like a long needle. The cicada uses it to pierce the bark of the tree and place her eggs into

the stem. In about 6-8 weeks the eggs hatch and the nymphs drop to the ground to begin the cycle again.

Cicada Identification

If you think you’ve found a 17-year cicada after the end of July, don’t worry. It’s probably not another mass emergence. Instead, you’ve likely found a look-a-like of the 17-year cicadas. Cicadas tend to have sturdy, thick bodies with mostly clear wings that are longer than their

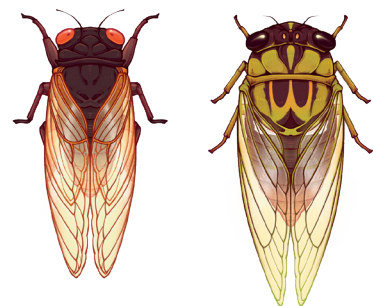


Figure 1: A comparison of the 17-year cicadas (left) and the annual cicadas (right). Image by Lianne Pflug.

bodies. Annual and 17-year cicadas are most commonly confused with each other. There are three main species of 17-year cicada in Indiana and about 16 species of annual and 13-year cicadas. 17-year cicadas are distinctive from the annual cicadas in that their bodies are a dark, nearly black brown with amber highlights on their wing veins, and red eyes (figure 1). Annual cicadas have green and black bodies and are a little bigger than 17-year cicadas (figure 1). To see a full comparison of the most common insects that are confused with 17-year cicadas download our Cicadas-and-Their-Look-A-Likes reference from Purdue’s cicada website (<https://extension.entm.purdue.edu/cicadas/>).

Impact on plants, animals, and what to do about it

The emergence of the 17-year cicadas is generally regarded as having either a net neutral or positive impact on the ecosystem. When these insects crawl to the surface, they are effectively moving a massive volume of nutrients in the form of their bodies from underground to above ground. This change has wide ripple effects throughout the forest community.

Impact on animals

Any animal that eats insects had quite the feast this spring. Cicadas are incredibly abundant in some areas, slow, and functionally defenseless against predators. The addition of

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these insects to animals diets has far reaching consequences for predators and for their normal prey. The emergence of 17-year cicadas is often tied to higher numbers of and heavier weights of many species of animals in the year following an emergence. On the upside, this means that wild turkeys tend to be more numerous and fatter in the fall. On the downside, there tend to be more mice and rats. In both cases, the animals are able to eat their fill more consistently and with less energy expended foraging than in normal years. In addition, prey animals get some relief from predators that would otherwise eat them. For example, there may be an increase in the number of some birds because animals (e.g. raccoons) that would normally eat their eggs satiate their hunger with the more easily accessible cicadas.

Impact on plants

Most of the damage done to trees by cicadas is caused by their egg laying (oviposition). 17-year cicadas will feed and lay their eggs on more than 270 species of deciduous woody plants. Cicada females prefer to lay their eggs in branches that are about 3/16 to 1/2 inch in diameter. Cicadas lay eggs by stabbing their ovipositor into tree bark which can create scars in the bark. Egg laying sites look like a row of small nail holes often with a crack or indentation between the holes (figure 2). There may be more than one line of holes if multiple cicadas lay their eggs in a single twig. If enough cicadas lay eggs in the same place, it can kill the twig. This damage often looks worrying (figure 3), but isn't a serious problem for well-



Figure 2: Egg laying damage caused by 17-year cicadas. Note the distinctive hole connected by a split in the twig. Image by John Ghent.



Figure 3: An example of the typical damage caused by cicada egg laying. Although it looks serious, this damage is unlikely to cause any long-term harm to the tree. Image by Pennsylvania Department of Conservation and Natural Resources-Forestry.

established, healthy trees. These dead twigs can be trimmed off either by the landowner or by a professional service.

Cicadas can have some positive benefits to trees as well. When the 17-year cicadas die, their bodies drop to the forest floor and begin to rot. Their death introduces a source of nutrients into the soil at an unusual time of year. There are studies that suggest that it may give a small boost in growth to trees and smaller plants in the understory. Additionally, the tunnels cicada nymphs dig in the soil may help with aeration. However, it's important to note that these positive benefits may be undetectable if another stress like drought is present.

Summary

Cicadas, despite their dramatic entrance every 17-years, have little negative effect on the forest ecosystem and, in many cases, provided an extra burst of nutrients for plants and animals alike at the start of the growing season. In most cases, the small amount of damage they cause can be removed or ignored with no harm to the tree. Further information on management can be found on the Purdue Cicada website (<https://extension.entm.purdue.edu/cicadas/>).

Elizabeth Barnes is an Exotic Forest Pest Educator with the Department of Entomology at Purdue University.



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Cave Spring Farm—Working in the Morning

By Dan Lynch

Cave Spring Farm is located in Owen County, on Indian Creek north of Gosport. The Farm history starts with William Asher (1740-1780) enlisting as a private soldier in the Virginia State Line militia in Virginia. William Asher served under General George Rogers Clark including the Illinois expedition 1778-1780. Ensign William Asher was ambushed and killed by Indians in June 1780 near Ft Louisville and was buried where he fell south of the Falls of the Ohio. William Asher's teenage son, Bartlett Asher (1764-1841) became a military orphan on that day. As result of his father's military service to the country on the Illinois Campaign, Asher was subsequently granted land in Indiana (1788) and Illinois (1832). The Indiana land grant was the nexus for 8 generations of family forestland ownership in Indiana. Bartlett is buried on his farm, marked by a 20th century tombstone placed by the Daughters of the American Revolution, in the woods north of Gosport. Bartlett's son William Asher (1792-1837), also served under territorial Governor and future president William



Spring Cave waterfall and Indian Creek Headwater. Note: man in the cave is obscured by the tree.



1934 Hoosier heritage dairy barn stabilized in 2010 with farm sawn heartwood poplar.

Henry Harrison at Ft Louisville and passed Gosport on an expedition north following the Battle of Tippecanoe.

At the head of Indian Creek north of Gosport is a spring cave now called Rogers Cave. Following military service William Asher returned to Gosport and operated a distillery and overshot water wheel flouring and lumber mill at the mouth of the Spring Cave starting in 1828. Corn liquor was hauled overland to Cincinnati or traded locally “a bushel of corn for a gallon of juice”. The mill produced nearly all the timber for local pioneer homes and buildings. The mill suffered low seasonal flow and was upgraded to steam power in 1850. The mill was abandoned in 1878 and left to decay. Industry moved to Gosport after the Louisville, New Albany and Chicago (later The Monon and now abandoned) railroad bypassed the mill in 1847. During the Victorian era, the train carried tourists from Gosport hotels to Cave Station, a train stop near the farm. Carriages shuttled tourists from Cave Station to Spring Cave box canyon for picnics. The box canyon and rugged cave area are now heavily wooded and hard to access. Cave station is long gone except on old maps. The mill, oxen road and the abandoned village of Middleton above the cave are difficult to imagine walking the woods today.

The spring flow today and varies seasonally. The cave floods during storms. In 2005, Dave Everton of Indiana University and the Central Indiana Grotto of the National Speleological Society requested access to the cave network. His team spent a summer mapping over 5 miles of wet crawlways. University of Illinois at Chicago also performed geological surveys in the cave and other nearby caves to research glaciation in Indiana. Carbon-14 dating verified woodland era fire pits used on an E-W Indian trace passing the cave.

My wife's grandfather recovered the old millstone early in the 20th century using mules. He donated the stone to Purdue where it sat outside an agriculture building for decades. John William Asher, my father-in-law, is professor emeritus at Purdue living in West Lafayette. The stone now sits outside the Pioneer building at the Indiana State Fair grounds. While I was at Purdue that millstone was my introduction to the Asher family farm. I didn't know the millstone's significance at the time. Ruth Asher was an IU school of social work student home visiting her family for the summer in West Lafayette when we met. Several years later we married and started careers in Indianapolis. Ruth spent summers on the farm as a child in the 1960s and was taught how to "steal eggs" from her grandmother's chickens, and "don't make the cows run". Our extended families cheer for IU and Purdue, but not always at the same time.

During the late 20th century the farm was increasingly remotely managed. The small broken tillable fields and pastures were leased and are still leased today. Family cattle operations and pastures were abandoned. Barns and houses were sold or razed. Logging and sawmilling stopped. Beehives under the big blackgums collapsed.

In 1992 I met Ruth's great uncle, Paul Asher at the farm. Paul was 94 at that time and was the last Asher standing, who still



Grass fed, hormone free Angus cattle.

worked the farm. He agreed to show me where to hunt ruffed grouse. The grouse were in a tangled overgrown thicket that I couldn't penetrate let alone swing a shotgun. Paul was a retired IU dentist and commuted from Greenwood most mornings, early. Paul worked the farm until noon when it got too hot. He had an antique sawmill powered by a 1954 Farmall tractor leather belt take off. Stickered hardwood lumber was stacked in 3 barns. I restored and use the Farmall. Those barns, the mill and ruffed grouse are all gone. Paul cut black locust posts in a month ending in "uary", when the sap is down. That morning Paul was hand digging a posthole along a ¼ mile fence, when I pulled up. I asked him: why a man your age was hand digging post holes? He stopped for a moment. Dan, Why does a young man your age play golf? He knew I liked golf. He was doing what he loved. Paul has been gone a while. Now I commute 3-4 days a week from Lawrence to kill invasive ailanthus, feed cattle, plant hardwoods and mend fence. I work in the morning, before it gets hot, like Paul did.

Cave Spring Farm is a Certified Tree Farm and all the eligible woodland is classified forest. The Ashers were early adopters of Indiana's classified forest tax program. Some of it was mature forest, some young stands needing TSI or marginal pasture progressing back to woodland. Parcels were being sold. Starting in 2005 Ruth and I bought 3 parcels over a 10 yr period to maintain 400 contiguous acres around Spring



Woodmizer band mill salvaging mixed hardwoods after a fierce storm uprooted trees across, the township. Grandfather's 1954 Farmall, abandoned 4 decades in a shed. Restored and skidding salvage logs




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Cave, a fraction of the original farm. Cave Spring Farm LLC was created for stewardship of the woodlands and preservation of tradition on Indian Creek. The tradition will pass to our sons.

We mill and barn dry saw logs on the farm periodically, totaling 10,000bf of mixed hardwood since 2006. Lumber sawn on farm has been used for barn restoration or gifted to family and friends who build furniture. We donate hardwood lumber to the Westminster Retirement Community shop.

I've restored a sinkhole filled pasture and raise grass fed hormone and antibiotic free beef. A young bull is back on pasture. We don't charge you to cross the pasture, but the bull will! Our neighbors the Watsons farm our small broken fields, some intertwined with their fields. They patiently teach me farming, animal husbandry and weld up my broken equipment. I owe a huge debt to Watson Dairy.

Following retirement in 2014, I became interested in locally supplied Indiana products. I started an experiment to supply locally grown hops to the Indiana microbrew industry after meeting with brewers. I joined the nascent Indiana Hops Growing Association and learned from the Purdue extension. I built a 1/8 acre, scalable pilot hop yard to test varieties from Michigan and adapted commercial techniques to the local limestone loam conditions. A hops bine (not vine) matures

in 3 yrs. Two varieties worked, two failed. Crazy Horse Hops in Knightstown has invested \$30 million in huge hops yard and a fantastic German engineered and supplied hops processing plant. They can support a new hops industry in the state. Water supply for hops irrigation expansion is scarce on the karst land at Cave Spring so I've decided not to scale up the 1/8 acre hop yard. Blind Owl Brewery in Indy purchases our fresh crop. If you visit the Blind Owl in the fall, try a pint of fresh hopped Cave Spring Farm Harvest Ale.

Ralph Unversaw, the Indiana district forester met with me soon after we acquired classified forest. He was a great help and recommended the Purdue Extension forest landowner class. Ralph also recommended contacting a consulting forester. I met John Stambaugh of Stambaugh Forestry in 2006. John's Purdue forestry background and location next door in Greene County were a good fit. He has advised me on timber management and general Indiana landowner issues. John managed 2 small timber harvests over 10 years, one single tree selection and one sale largely of ash. The ash cut created 1 acre oak regeneration openings before the ash borer ravaged the township. He continues to advise me on herbicide use for invasive control and his company completed several conservation projects under the EQIP program. I value the long term consulting relationship. John recruited me into the Indiana Forestry and Woodland Owners Association.



May 2021 hops yard with 6-year-old Chinook and Cascade bines supplying Blind Owl Brewery in Indianapolis with fresh local hops. Bines grow 17 ft. up new coir strings each spring.



Three thousand seedlings hand planted over 15 years by family, friends and Stambaugh Forestry. The 2005 crew shown here planting white oak, walnut, spruce, and white pine pasture wind break.

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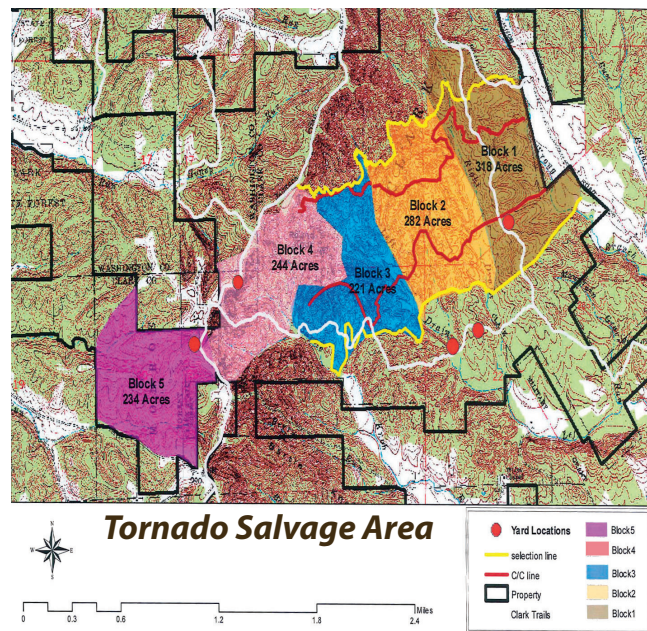
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Clark State Forest—Then and Now

By Brad Schneck

On March 2, 2012, a deadly tornado outbreak occurred over a large section of the southern United States into the Ohio Valley region. The storm resulted in 40 tornado-related fatalities, 22 of which occurred in Kentucky. Tornado-related deaths also occurred in Alabama, Indiana, and Ohio.

As a result of that outbreak an EF-4 tornado left behind a path of destruction as it moved through Clark County, Indiana. The tornado's path spread 56 miles reaching speeds of 177 mph. Parts of Pekin and Henryville were heavily damaged including approximately 1,300 acres of Clark State Forest.



Map of management units and salvage harvest boundaries in the area of Clark State Forest damaged by tornadoes in 2012.

turned to restoring trails and salvaging the many damaged forested acres.

Three salvage operations took place across five units spanning three years. Units ranged in size from 221 acres to 318 acres totaling 1,300 acres (see map). Within the five units two separate treatment areas were identified. The area between the red lines was considered the most severely damage trees and prescribed as the clearcut zone. The area between the red and yellow lines was considered the intermediate zone where considerably less damage occurred. Only damaged trees were removed in the intermediate zone. Salvage removal included pulp, cords, sawtimber, and some veneer.

Salvage efforts removed an estimated 4.13 million board feet generating \$452,419.00 in revenue. As a result of the revenue approximately \$67,863.00 was returned to the county as part of the 15% returned to the county in which the timber was removed.

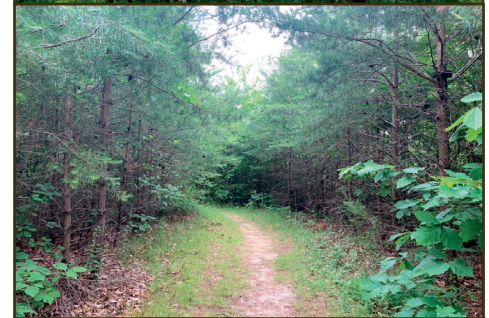
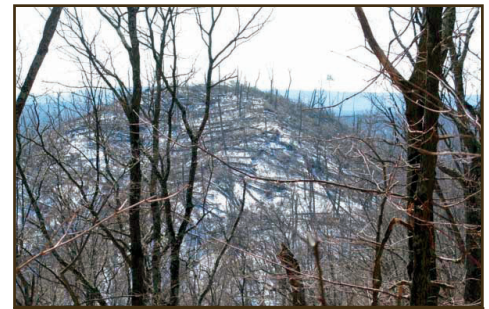
Additionally, over 20 miles of recreational trails were restored including 4.5 miles of the popular Knobstone Trail and prescribed fire was administered across 123 acres.

Today, the site is progressing providing dense young forest habitat.

Brad Schneck is an Assistant State Forester, Properties with the Indiana DNR Division of Forestry.

Little structural damage occurred to the state forest, but tree damage was estimated at 3-6 million board feet. Nearly half of the state forest horse trail system was affected by the destructive path as well as section of the Knobstone trail.

Clean up efforts begun immediately. The Department of Natural Resources (DNR) deployed crews to assist with cleanup efforts in and around the town of Henryville. Initial efforts focused on reopening roads and neighborhoods. Eventually, DNR efforts



Downed trees and damage caused by a tornado, March 2012.; Regrowth of trees in June 2021, the 10th growing season after a tornado.; Section of the Knobstone Trail near the Jackson Road Trailhead.; Educational sign at the Jackson Road Trailhead.; Oak and pine regeneration in the tornado site.

Hardwood Economics & Industry Update

By Chris Gonso

The major story late this spring and early summer was price surges for lumber which was focused mainly on softwoods but got a lot of national media attention. Hardwood lumber prices increased too and for a lot of the same reasons but not to the extent observed in spruce, pine, and fir markets. Demand for lumber has been driven by strong US residential home construction and remodeling activity and export markets rebounding from pandemic slowdown.

The State of Indiana has been tracking weekly, green lumber prices for hardwoods since 2002. The five most common hardwood species by volume of merchantable timber in Indiana's forests are: red oak (14%), tulip poplar (13%), white oak (12%), sugar maple (11%) and hickory (10%). All at or very near historic price highs per board foot across grades.

Chart: US dollar price per board foot for 4/4 (1"), green lumber, 7/23/21

Species	FAS grade	#1 Common grade	#2 Common grade
Red oak	\$1,300	\$990	\$955
Tulip poplar	1,325	795	580
White oak	2,820	1,425	925
Sugar maple (unselected)	1,960	1,300	765
Hickory	990	755	605

According to the Hardwood Market Report, an industry publication, "Manufacturers are still pressing to increase lumber supplies needed to boost production. Most are bringing in more lumber than earlier in the year, but it has not been enough to attain the higher production goals. Sawmill output is still running behind pre-COVID levels, and there is significant competition for the lumber being produced."

Mills and secondary manufactures, buoyed by higher prices, and encouraged mostly by strong domestic markets, are looking to expand production. There have been scattered business expansion announcements throughout Indiana recently in the millwork, cabinet, wood truss, and contract wood furniture manufacturing sectors. As before the

pandemic, the major issue limiting hardwood industry growth is securing labor force. Transportation costs is another concern and lingering supply chain disruptions do exist, particularly for machinery. Indiana-based Wood Mizer, for example, reported recently that lead times had doubled for new orders of sawmills.

Efforts to assist businesses affected by the pandemic continue and

Since the beginning of the year, #1COM lumber price per board foot has increased in all important Indiana hardwood species by the following amounts: red oak +36%, tulip poplar +59%, white oak +46%, sugar maple +31%, hickory +42%, soft maple +25%, ash +63%, walnut +60%, and cherry +58%. Supply constraints for lumber exist predominantly at the processing/sawmill capacity-level and not for standing timber stumpage. Thus, prices paid to forest landowners for stumpage have not been rising at the same levels as those listed above for green, sawn lumber.

there are a number of State and Federal funding programs in place to provide aid. One example is with the USDA Farm Services Agency which has recently begun accepting applications for its Pandemic Assistance for Timber Harvesters and Haulers Program that will provide relief to timber harvesters (loggers) and haulers that experienced a loss of at least 10 percent gross revenue in 2020, compared to 2019.

Exports of Indiana lumber and veneer have been consistently above 2020 levels so far this year. Indiana log exports

Source: Hardwood Review

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were down in the first quarter but have recovered in April & May according to the most recent data available from the US Census Bureau. Indiana hardwood export markets mostly mirror those at the national level. China remains the dominant export market. Current year to date volumes shipped to China nationally are down by about 9% but dollar values of those shipments are up by 10%. Hardwood board foot shipment volumes are up to other major trading partners: Canada +59%, Vietnam +2% and Mexico +46%.

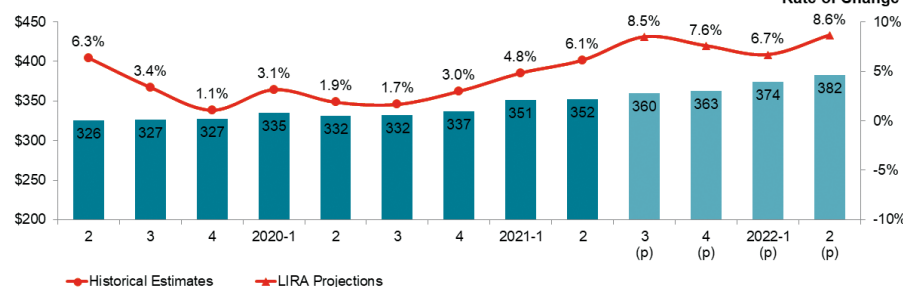
Since recovery from the 2008 financial crisis, over-reliance on the China export market has been an important concern of the US hardwood industry. The current, strong domestic market helps to address this issue. The Joint Center for Housing Studies of Harvard University reports that its Leading Indicator of Remodeling Activity projects annual growth in home renovation and repair will reach 8.6 percent by the second quarter of 2022. Things look good for the hardwood industry into the future.

Remodels, additions and home repair as well as new home construction are major drivers of hardwood demand. The promotional effort by the hardwood industry, Real American Hardwood branding effort and campaign, <https://realamericanhardwood.com/> seeks to influence US consumers, encouraging them to select hardwoods as home investments are made. Hopefully you will see some of this consumer tested marketing material as you shop and an increasing amount of the industry will use the brand logos.

The national campaign to highlight the benefits of natural wood is enhanced by multiple efforts and opportunities occurring in Indiana. One is the Woods on Wheels project. This mobile, interactive exhibit is visiting communities

Leading Indicator of Remodeling Activity – Second Quarter 2021

Homeowner Improvements & Repairs Four-Quarter Moving Totals Billions



Notes: Improvements include remodels, replacements, additions, and structural alterations that increase the value of homes. Routine maintenance and repairs preserve the current quality of homes. Historical estimates since 2019 are produced using the LIRA model until American Housing Survey benchmark data become available.

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throughout Indiana and providing education on forest management, hardwood industry and resource sustainability. You can call 765-516-3000 to request the traveling exhibit visit your community event or local school. Another opportunity that engages young people in learning about hardwoods will be at the Indiana State Fair where the “Forever Forest”, an interactive exhibit created by the Omaha Children’s Museum, will be open and free in the Farm Bureau Building with State Fair admission. Also, the Hoosier Hardwood Festival will take place August 27-29, 2021 at the Marion County Fairgrounds.

Woodland owners are a vital link in the hardwood industry and a key component of the Indiana Hardwood Strategy. Economic conditions are good and the hardwood industry is doing a lot to support the increased, wise utilization of our forest resource. These efforts aim to keep forests as forests and ensure a healthy future for us in all the ways we depend on our woodlands.

Chris Gonso is the Hardwoods Program Manager with the Indiana State Department of Agriculture.

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The Birders' Dozen

Profile 1: Red-headed Woodpecker

Dr. Jessica Outcalt, consulting bird biologist

Welcome to the Birders' Dozen! Over the next several issues, we are going to introduce a series of bird species from Forestry for the Birds. The Birders' Dozen are forest birds that can benefit from targeted management practices, as most are declining due to habitat loss. We've curated this list to cover a wide range of habitat types, from young to mature forest, open to closed canopy, or dense to non-existent shrub layers. Our goal is to engage landowners and foresters in the process of managing forests for wildlife, or "forests for the birds."

In this first profile, we'll meet one of the poster children for the project, the Red-headed Woodpecker.

Our most boldly patterned woodpecker, this charismatic bird can be heard giving its loud call, almost like a bark, from snags (standing dead trees) and large trees in open woodlands and savannas (a transitional habitat type between grassland and woodland). They're the only woodpecker in the Central Hardwoods that are sexually monomorphic, which means males and females both share the distinctive red head that gave the species its name.

Though its population has cycled over the last few centuries, it has decreased significantly in recent years. Reforestation in the eastern part of the continent has benefitted many species, but the Red-headed Woodpecker depends on openings and edge habitats, as well as dead trees for foraging and nesting.

Natural History

Red-headed Woodpeckers are regularly present in oak savannas and woodland areas, as well as forested areas opened by disturbances. In the breeding season, these omnivorous woodpeckers eat primarily seeds and nuts, though insects and small vertebrate prey such as mice and nestling birds are occasionally taken as well. In fact, Red-headed Woodpeckers are one of the few woodpeckers that can catch flying insects in addition to wood-boring insects.

Their boldly patterned feathers can be seen flashing as they sally out from conspicuous perches, catching insects in their bright white bill. In the non-breeding season, hard mast such as acorns, beechnuts, and pecans are their primary food. In order to find this food source, Red-headed Woodpeckers move into mature forests during the winter, and can often be found in habitats traditionally associated with mature forest specialists such as Wood Thrushes and Cerulean Warblers.

Most foraging occurs on dead limbs and trunks, as does nesting. Red-headed Woodpeckers are primary cavity nesters, which means they excavate their own nest holes in dead trees or dead portions of live trees; these holes are occasionally re-used by the same breeding pair and often used by a variety of species in subsequent years (Frei et al. 2020). In fact, one of our other target species, the Eastern Screech-Owl, can later use cavities originally created by Red-headed Woodpeckers.

Male and female Red-headed Woodpeckers, which can remain together for several years, create a cavity that's approximately 12 inches deep and 3-6 inches wide, into which the female lays a clutch of 3-10 small, white eggs. A second brood is possible, and the parents often raise this subsequent brood in a second snag. After a two-week incubation period and a month-long nestling period, fledglings leave the nest and begin foraging for themselves. These fledglings have a gray head, rather than the distinctive red of the adults, but quickly molt and grow bright red feathers.

Habitat Management

Retention of snags and creation of clearings, as well as encouraging growth of oak and other mast crop species like beech and pecan, can greatly benefit the Red-headed Woodpecker. In many parts of the continent, prescribed fire can create this woodpecker habitat, fostering a savanna habitat type. Beaver-caused damming of



streams can also create a flooded forest habitat type with plenty of snags. Even in small habitat patches, creation of a single snag by girdling a tree can be beneficial.

The Red-headed Woodpecker is a unique species on our list, in that it is migratory but its summer and winter ranges overlap in Indiana and the Central Hardwoods. Birds you see in the summer in your patch of young forest or savanna will spend the winter in mature forests in the southern part of the United States, while the birds in your stand of oaks and beeches in the winter came from young forests in the northern states. In essence, this means that forest management for both young and mature forests can benefit this species across its entire range, and can benefit other birds in both habitat types. In particular, management for early successional forest such as the habitat types used by breeding Red-headed Woodpeckers can mitigate habitat loss that has affected this and many other species.

If large scale forest management is unfeasible in your habitat patch, backyard management can also benefit Red-headed Woodpeckers and other wildlife species. These woodpeckers occasionally come to bird feeders, so provision of clean water and regularly-cleaned feeders with protein-rich food can be beneficial. However, window collisions, especially at rural houses with feeders, can be a risk for woodpeckers and many other bird species. Turn off excess lights at night, cover windows with reflective materials, and place feeders at least 25 feet away from windows. In addition, pesticides such as neonicotinoid insecticides such as Imidacloprid can damage insect populations on which woodpeckers depend, and lessening or stopping their use can have benefits for woodpecker abundances.

Conclusion

Though the Red-headed Woodpecker's population is dropping due to habitat loss, woodland owners in Indiana have a unique opportunity to foster this charismatic species. Breeding woodpeckers can greatly benefit from creation and maintenance of early successional forest, and wintering woodpeckers from maintenance of mature forest, particularly when snag retention is part of the management plan. We hope that land owners and foresters can benefit from Forestry for the Birds, for the benefit of both overall forest health and Red-headed Woodpeckers.



Photo by Matt Williams Nature Photography

Special thanks to the Alcoa Foundation, the Indiana Forestry Educational Foundation, and The Nature Conservancy for their support and leadership of Forestry for the Birds.

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Jessica Outcalt is an independent consultant working with The Nature Conservancy since 2020. Her "day job" is as a field technician doing avian surveys with WEST, an environmental consulting firm. She completed her BS in biology at Taylor University, her PhD in wildlife ecology at Purdue University, and is passionate about birds and getting people involved in conservation and scientific processes.

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Woods on Wheels has a target audience of 4th - 6th grade students but includes information for high school students eager to explore forestry career options, landowners needing expertise, policymakers looking to inform their decisions, educators, and fact-seeking members of the public. Along with having beneficial information for all within the exhibit, the Woods on Wheels forester will provide more in-depth information and guidance.

Woods on Wheels is housed in a 40-foot trailer that is pulled by a pickup truck "Dually". The exhibit will be made available at no expense to elementary school programs as well as for public events such as maple festivals, fall foliage festivals, and forestry-related events. State, county and local officials may also request Woods on Wheels for various local events. The collaborators intend for Woods on Wheels to visit all 92 Indiana counties as often as possible. Woods on Wheels availability for all school programs runs September–October and April–June to avoid weather risks. Additional information, including guidelines and a request form, can be obtained by contacting Sara High, Woods on Wheels operator, Indiana Department of Natural Resources at 260-573-3328 or shigh@dnr.IN.gov. Woods on Wheels was made possible by the hard work and dedication of the Indiana Hardwoods Lumbermen's Association (IHLA), Purdue University, Department of Forestry & Natural Resources, and the Indiana Department of Natural Resources, with the support of the state's hardwoods industry.



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Ask the Steward

By Dan Ernst

Question: A number of Blue spruce trees in my windbreak are looking pretty bad. Several have dead areas with few needles that progressed quickly over summer and now have little brown cones hanging in the dead areas. Any ideas?

Answer: While Blue Spruce is not a native tree to Indiana it has been widely planted in windbreaks, yard trees and landscape screenings. It's been a great tree, but also one with a handful of common insect and disease problems, which has caused it to fall out of favor the last several years. In your case the dead, bare branches and 'little brown cones' is a dead give-away that at least one major issue in your trees is 'Bagworm'.

Bagworms are moths that feed on trees and shrubs during their larval stage, and are most frequently found on arborvitae and junipers, but are also common on Blue spruce. The 1-2" cone shaped 'bags' hanging from the branches are made of silk spun by the larvae together with fragments of spruce foliage. The larvae live within and carry the bags around with them as they eat the tree needles providing them camouflage and protective cover.

To control Bagworms: If possible, pick the bags from the trees and destroy them. They house the feeding larvae in the late spring and summer, and eggs laid by the female during the fall and winter. As the eggs hatch in the spring the new larvae build their own bags and the feeding cycle begins anew. If you can remove and destroy the bags, no chemical treatments are necessary. But, remain vigilant with annual inspections watching for new outbreaks.

If you are unable to remove the bags due to trees size, treatments with chemical pesticide, or biologic controls can also be effective. However, it is important to notes these treatments must be applied in accordance with label directions and during the active feeding cycle to be effective. For example, the bacteria *Bacillus thuringiensis*, **often called Bt**, must be applied in mid-June to early July while the bagworms are still young. The plus for Bt is that it is selective and only kills certain insects, including bagworm, and does not affect humans or animals. The downside is that multiple applications (2 weeks apart) may be necessary depending on local conditions. If chemical control is necessary, use only a spray specifically labelled for bagworm and your tree species. Carefully follow all label directions and treat the affected area of the tree. July is a good treatment month in Indiana as feeding slows in August. These materials can be found at a variety of garden centers and hardware stores.

Question: Several of the younger maple street trees in my town have significant split and peeling bark on one side of the tree's trunk. What's causing this?

Answer: This is common problem on street, yard and landscape trees and if you'll look closer you will nearly always find this bark split on the South/Southwest side of the tree. The damage is known as 'Sunscale' and sometimes aptly referred to as 'southwest injury', which damages cells under the bark causing an elongated dead area and bark splitting. Sunscale can occur during summer months in hot climate areas as stressed cells die under the overheated bark, but here in Indiana, winter sunscale is more common.

Here's what happens. Nice, healthy looking trees are pulled from their shaded tree nurseries where they have been cared for and watered, and get plopped down in the middle of their new home- perhaps a sun baked street tree planting berm, parking lot, or wide-open front yard. This can be pretty shocking for the tree. Watering may no longer be regular, planting technique shoddy and the shade it was accustomed to is gone. Yet for much of the year the tree tolerates and tries to adjust to its new home. Then comes the stress of winter. The bright sun warms the frozen tree and the sun's rays intensified by reflective snow cover and light-colored surfaces. Notably, the sun rays reflect most intensely on the young tree's south and southwest sides causing the tree bark to heat up further and cell tissues to break dormancy and become active, only to be frozen and killed by nighttime freezing temperatures. The result- sunscale.

In addition to the heating and temperature extremes noted, water stress is also a significant factor. Well hydrated trees are less likely to be damaged and is a good reason to keep newly planted trees appropriately watered during dry periods, even going into winter.

Young trees, and thin barked trees, such as Red maple and crabapple are more susceptible to sunscale. Fortunately, trees generally become more tolerant as their bark matures providing better insulation and their root systems become well established to provide needed moisture to the tree.

To treat damaged trees, carefully remove the loose peeling bark with a sharp sterilized knife or pruners. This allows the wound to dry, promotes healing and lessens the chance for insect and disease issues to form under the dead bark. In extreme cases sunscale may result in tree death, but in most cases, cared for trees will heal themselves.

An interesting side note: some tree transplanters take the time to orient transplanted trees to ensure the same side faces South as it did on the original growing site. The reason is that the bark on the natural South side of the tree is inherently thicker and better able to withstand the bright sun's rays and hence transplant shock and sunscale issues are reduced.

Dan Ernst is a professional forester and past Assistant State Forester with the Indiana Division of Forestry. He has authored 'Ask the Steward' since 1992 and can be reached at foresterdan@yahoo.com

Hoosier Hardwood Festival Comes to Indiana!

Mark your calendars for the Hoosier Hardwood Festival August 27th-29th, 2021, at the Marion County Fairgrounds, Indianapolis.

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