The Woodland Steward

Promoting the Wise Use of Indiana's Forest Resources

The Best Science at the Time

WSI Presidents Letter 2019

If anyone ever tells you that the science is settled on a topic, be very skeptical. Science is rarely settled. New technology, new methods, new information and new ideas will keep scientists busy for the rest of forever. As a landowner, manager or forester we cannot wait until the science is settled before we act or make a decision. We must rely on the "best science at the time," and then move forward.

I was reminded of this by several Woodland Steward readers this past year that took the time to write a letter or send an email regarding problems we face today because the "best science at the time," 40 or 50 plus years ago has come back to haunt us.

Looking back at pre-European Indiana when it was 85% forest land makes me wish my ancestors would not have cleared, burned, stripped, plowed under and removed so much of the forestland in Indiana. But they were trying to survive. They had to build cities, towns, roads, clear land for agriculture and scratch out a living the hard way. I cannot judge what they did in the past by today's understanding of ecology, forestry and wildlife management. And if we jump back to the 1930s, 40s and 50s. Foresters and Wildlife Biologists were trying to grow back Indiana's forests and wildlands and stop massive erosion problems. The states natural resources were so depleted that we were desperate to restore anything we could. The Civilian Conservation Corps (CCC) planted a lot of pine in Indiana to help stop erosion, cool the land and allow native species to seed back in. Most pine species are not native to Indiana, but they did not have access to the native hardwood tree nurseries that we have today. The pine did its job and reminds us of the massive ecological problems they were dealing with in the 1930s.

Many of the problems we face with invasive species today are the result of the best science of the time trying to solve ecological problems of the past. Invasive plants were embraced and planted at a time when foresters, wildlife biologists, soil scientists and landscapers were desperate to establish any shrub that would produce lots of food for wildlife and provide cover and shelter. I know many foresters that planted alternating rows of black walnut and autumn olive. The thought was that autumn olive would fix nitrogen in the soil, help the walnuts grow and suppress the weeds around the walnut seedlings. And it worked. It was the best science of the time. But now we know better. We know that autumn olive is an invasive nightmare, because it produces a lot of fruit, the wildlife love it and it spreads like crazy suppressing many native plants that we want to grow.

There are many examples of situations just like this where the best science of the time, may turn out not to be the best idea. But more often than not science leads us to a new and better understanding of the world we live in and helps us make good decisions. In our second issue of the Woodland Steward in 1992 we featured our first article on invasive species. We reviewed herbicide options and application methods for controlling multiflora rose. Fortunately, we now know that invasive species are not good for the environment and best way to stop the problem of invasive species is stop bringing in new invasive species.

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IN THIS ISSUE

visit us online at www.inwoodlands.org

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Calendar of Events

May 1
Arbor Day Celebration
1:00 pm
Lake Iola, Scott County
Contact mcraig11@yahoo.com.

May 6
Invasive Insect Workshop
5:30 pm
Eckhart Park, Auburn, Dekalb County
RSVP to 260-925-5620 ext 3

May 18
Regional Pecan Grafting Workshop
9:00 am - 5:00 pm
Scott County
Registration cost, RSVP to https://www.infga.org/.

May 21
Breakfast with a Forester
8:00 am EDT – 9:30 am EDT
Round the Clock Restaurant, LaPorte
No RSVP required.

May 31
Young Forests for Sustainable Habitats
1:00 – 3:00 pm
Morgan-Monroe State Forest, Forest Training Center
6220 Forest Road, Martinsville
RSVP to 317.234.5143 or drogler@dnr.in.gov.

June 7-9
Woodland Wildlife Steward Landowner Workshop
Morgan-Monroe State Forest
Martinsville, IN
Limited space. Apply by May 1 at
https://bit.ly/2QXIJav

June 12
Northwest Indiana Conservation Happenings
Discussing conservation efforts in northern Indiana.
IU South Bend. St Joseph County
Contact 812-512-9158 or bfeaster@dnr.gov.

June 18
Breakfast with a Forester
8:00 am EDT- 9:30 am EDT
American Table Restaurant, Warsaw
No RSVP required.

June 29
Hoosier National Forest Hike
9:30 am
Hardin Ridge Recreation Area, Lawrence County
RSVP at https://bit.ly/2v96hj3

For other woodland owner events, see www.ifwoa/events or check the DNR calendar for state forest, park and nature preserve events at https://www.in.gov/dnr/8153.htm. If you have an interest in county cooperative invasives management groups, see the calendar at http://www.sicim.info/ for meetings in your area.

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Send inquires or donations to:
Woodland Steward Newsletter
P.O. Box 490, Nashville, IN 47448
or www.inwoodlands.org

Woodland Steward President
Dan Shaver
dshaver@tnc.org

Woodland Steward Editorial Board Chairperson
Brian MacGowan
macgowan@purdue.edu

The opinions expressed by the authors do not necessarily reflect those of the Woodland Steward Institute. The objectives of the newsletter are to provide general and technical natural resource information to woodland owners of Indiana, improve information distribution and build support for responsible forest resource management.

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Indiana Woodland Steward Institute

Did you know the *Woodland Steward* is online? View past issues and articles and save some paper! Sign up for the email version at: *www.inwoodlands.org*

A Spring Time Evaluation of Your Woodland

By Dan McGuckin

After a long, dreary winter, many people start spending more time in their woodlands in the spring. Lengthening days, warmer temps, the wakening of dormant frogs and flowers and the return of migratory birds draw our attention to the outdoors.

Early spring is a great time to evaluate the health and condition of your woodlands, before heavy leaf cover and humid temperatures discourage all but the hardiest souls.

As you increase your outdoor activities there are many things to take note of:

1. **Storm damage.** Did winter storms blow over or break branches from any trees? If you haven't cut vines from your highest quality hardwoods, you may notice excessive damage if you were impacted by recent ice storms. Watch for erosion at designated stream crossings and on trails.
2. **Insect damage.** Emerald Ash Borer beetle has spread through most of Indiana. A few locations in Southern and Western Indiana are still to be impacted. Bark defoliation from opportunistic- minded wood peckers is often the first sign noted.
3. **Drought impacts.** We are still noting stress and decline in many tree species from the drought of 2012. Yellow-polar, Black Oak and Sycamore seem to be the most effected. These species can have significant financial value, so if your trees appear impacted, consider having a select timber harvest in your woods to capture their value.
4. **Invasive plant inventory.** Many non-native invasive plants are adapted to cooler climates and therefore will start to green-up several weeks before our native pants do. Inventory the species present, map their location and research appropriate control techniques.
5. **Walk your boundaries.** Clearly marked boundaries can help you keep your bearings and maintain good relations with your neighbors. Indiana has a purple paint law that allows you to mark you land with the same legal effect as using a No Trespassing sign.
6. **Practice and confirm your winter tree identification skills.** Note the bark characteristics of common trees and watch for their leaf flush to confirm your ID.
7. **Watch for tick activity as temperature increase.** Tick populations have increased in recent years, with a variety of natural factors to blame. Some species are vectors for many life-threatening diseases. You can reduce your exposure to ticks by treating your clothing with Permethrin insecticide, wearing light colored clothing and tucking your pants into your socks. One added benefit to these practices is that you can embarrass your kids or spouse at the same time!

If you determine that your need help evaluating or managing your woodlands, consider hiring a private consulting forester. A list of private consultants can be found at *www.findindianaforester.org.*

Dan McGuckin is a certified wildlife biologist and certified forester and current Woodland Steward board member. He is now president of Habitat Solutions, a private forestry and wildlife consulting firm in southern Indiana.

Indiana Hardwood Strategy

By Chris Gonso

On February 5th in Indianapolis, Lieutenant Governor Suzanne Crouch announced a new economic development strategy to grow the Indiana hardwoods industry. The Indiana Hardwood Strategy was commissioned by the Indiana Hardwood Lumberman's Association, Indiana State Department of Agriculture and Indiana Department of Natural Resource's Division of Forestry. It was completed by DJ Case & Associates of Mishawaka, Indiana in cooperation with Purdue Center for Regional Development, Purdue Extension and Dr. Satish Ukkusuri of Purdue.

Indiana's resource base of 5 million acres of forest land, the vast majority, 84%, privately owned, supports a strong primary industry of sawmills and initial processers of timber and vibrant secondary industry that takes the work of those companies to a more final product. The hardwood industry in Indiana, including primary, secondary and tertiary or support industries, employs over 70,000 workers and pays $1.1 billion in state, local and federal taxes each year. The economic impact of the hardwood industry in the Hoosier state is over $10 billion annually.

Indiana is known for producing the highest quality walnut and white oak in the world. The state ranks first in the nation for the production of sliced hardwood veneer. The world capital for wood office furniture is in Dubois County around the town of Jasper, IN. The national capital for RV manufacture in Elkhart County, Indiana is also an important regional cluster for wood products. But the hardwood industry has an impact in every county of the state, leading to top national ranking for the production wood kitchen cabinets, manufactured homes, engineered wood products, pre-fabricated wood buildings and upholstered household furniture. Wood products in Indiana have the largest economic impact of any segment of agriculture in the state, more than all row crop agriculture put together including corn and soy beans for livestock and human use, vegetable, fruit and nut production which all combine to total $6.7 billion annually.

The most important strategies outlined in the Indiana Hardwood Strategy are to foster the growth and expansion of existing hardwood businesses, increase Hoosier business-to-business connections to ensure that secondary manufacturers are aware of primary resources that may be available within the state and develop additional uses for hardwood products like thermal modification which enables tulip poplar, for example, to be used for siding and decking and other outdoor applications and hardwood cross-laminated timber (CLT). CLT is being used extensively in Europe and on the US west coast in building wood-based, high-rise buildings for structural and wall panel applications. Developed countries are beginning to understand the sustainable benefit to using renewable resources like wood as a raw material.

The Indiana Hardwood Strategy identified that these sustainable benefits of hardwood also needs to be promoted to Hoosier and US consumers at large. Consumers, it seems, are largely unaware of the sustainability of Indiana hardwoods and over the past 20 plus years have increasingly been choosing substitute products manufactured from petroleum or other fossil-based sources in place of hardwood. The decrease in domestic US consumption of hardwood grade lumber has led to an increasing reliance on export markets, especially China's growing middle-class. But it is recognized that in general for landowners to receive the highest value for their standing timber, for the primary industry to receive the highest value for boards, staves, etc. diverse and strong markets need to be promoted both overseas and domestically.

To an important extent, Indiana's 5 million acres of high quality forestland are dependent on strong markets that pay for their management and the ability to retain sun-loving species like oak, hickory, walnut and tulip poplar and provide some financial return. The Indiana Hardwood Strategy also recognized that supply can be improved with more direct engagement with private forest landowners and a communication strategy "to effectively communicate the benefits of healthy forest management to Indiana citizens, encouraging more active management on public and private lands." Woodland Steward Readers may be aware

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About a Woods in North Central Indiana

By Bruce Wakeland

Thirty seven growing seasons ago in January of 1980, at 31 years of age, I purchased a 16-acre parcel which included a 4-acre cornfield and 12 acres of woods. My primary purpose was a long-term timber production investment. I also decided to track the growth of the timber and cost and income from sales, so that someday I could write such an article as this. I paid $1,150 per acre for 16 acres. I planted the 4-acre cornfield to trees in the spring of 1981. Of the remaining 12 acres, 1.5 acres was a stand of young elm. I sold the elm as firewood and planted black walnut. These 5.5 acres of tree plantings are doing very well and would be a good topic for a future article; however, this article is about the productivity of the remaining 10.5 acres of woodland.

This woodland is located on rolling glacial till sandy loam soils making this a little better than an average timber producing site for northern Indiana. This woods has a small stream that has water flow only during wet periods. There is a log yarding area of about one-half acre within the woods and next to the county road. Previous owners had high-grade harvested the woods and had periodically grazed livestock in the woods. This resulted in the overstory being dominated by hickory and low quality oak. Hickory is a slow growing and lower value species making it a poor tree to have as your main species in a timber investment woodland. The younger trees were much more encouraging and were the main reason I bought the property. These younger trees were mostly 8 to 12 inches diameter at breast height (DBH), and included many quality black walnut and black cherry. My 100% inventory of all merchantable trees 12 inches DBH and larger showed there to be 5,320 board feet per acre Doyle scale at the time of purchase. I appraised the 1981 beginning volume to have a stumpage timber value of $1,010 per acre. The beginning volume included 13 species of which 35% was hickory. This woodland was producing well below its potential because of a poor species mix, low timber quality, and a less than ideal stocking level among over story trees.

My first step in the management of this woods was to have an improvement type timber sale in 1981. This sale included 66 trees, having 19,404 bd.ft., 35 hickory, and over mature and defective oak. After the harvest, I did timber stand improvement (TSI) work to complete the harvest openings, to kill cull trees, to cut grape vines, and to do some crop tree release among the pole sized trees. The income from the sale after deducting consulting forester timber sale and TSI cost was $2,919 or $278/acre.

I conducted my second timber sale in 1995. This was also an improvement type harvest including 99 trees, having 22,396

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2018 Indiana Logger of the Year

By Ken Day

Darrell Minor of Hartman Logging and Lumber, Greencastle, Indiana is the 2018 Indiana Logger of the Year. Minor was selected for being an outstanding "professional logger" in carrying out logging operations, dedication to protecting forest and water resources, and dedication to safety. He was recognized at the Tree Farm Breakfast at the Indiana Hardwood Lumberman's Association (IHLA) convention in Indianapolis on February 5, 2019.

Minor is noted for masterful performance in conducting logging operations through excellent skid trail and road layout, protection of the residual trees, and excellent directional felling of timber. He protects the soil and water resources by using skid bridges and implementing Best Management Practices throughout the logging operation. These activities leave the forest in the best possible condition for future growth and development.

He logs about 2 million board feet per year utilizing rubber tired skidder, knuckle boom log loader, manual felling of trees with chain saw, and a forwarder when needed. Minor markets all possible products in his logging operations as saw logs, veneer logs, pallet logs, and firewood when possible resulting in excellent utilization and minimizing waste. Minor has excellent working relationships with landowners, consulting and DNR foresters, sawmills, and veneer companies. He is noted for listening and going "above and beyond" to carry out landowner requests.

Attention to safety is very important to Minor. Nomination support letters state that he always utilizes personal protection equipment. Minor has attended Cutter Training Level 1-4, SFI training, CPR, and First Aid training. He

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is noted for taking the time to educate others whether landowners, foresters, or Purdue forestry students. Minor was the 1995 Indiana "Game of Logging" champion and represented Indiana in the national competition.

The Logger of the Year is sponsored by Indiana Tree Farm. Recognition of outstanding professionalism in sustainable forestry practices and education are two of their objectives. Awardees are selected by the Indiana Tree Farm Committee which has 31 members representing a cross section of forestry professionals in the state.

Ken Day is retired Forest Supervisor of the Hoosier National Forest.

Hardwood Strategy *Continued from page 4*

that the high quality forests we have today are the result of the intensive land management in the past but many other current forestland owners may not be aware that without management we will see species and forest composition shifts that will be detrimental to existing wildlife and human uses.

Woodland Steward readers are encouraged to continue their informed forest management, and where they are financially able to, choose Indiana wood products for their business and personal use. Each of us can do what we can to promote the use of sustainable natural resources and make headway against an increasingly throw away culture. Let's ask for real hardwood products made from Indiana grown materials and support the retention of our oak-hickory forests and Indiana hardwood industry workers in the process!

More information about the Indiana Hardwood Strategy, including the full assessment report, is available on the Indiana State Department of Agriculture's webpage: *https://www.in.gov/isda/hardwoods.htm*

Chris Gonso is the Hardwoods Program Manager for the Indiana State Department of Agriculture and can be reached at cgonso@isda.in.gov.

2018 Indiana Tree Farmer of the Year

By Ken Day

Brent Clary of Lafayette, Indiana is the 2018 Tree Farmer of the Year. Clary has practiced sustainable forestry for about 40 years and been in the national Tree Farm System for about 28 years. He was selected for long term intensive management for timber and wildlife while providing educational opportunities. Clary accepted the award at the Tree Farm Breakfast at the Indiana Hardwood Lumberman's Association convention in Indianapolis on February 5, 2019.

The forest management has been guided by professional foresters and keeping the management plan current with the most recent revision in 2017. Foresters regularly inspected the woodlands including insects and disease. Emerald ash borer attacked the ash trees and all merchantable ash trees were harvested in 2017.

The 82.4 acre tree farm has been intensively managed over the years yielding over 268,000 board feet and 45 cords of firewood from timber harvests. Cutting methods have included thinning, selection, and clearcutting. Timber stand improvement has been conducted throughout the tree farm and 15 acres were planted to hardwoods. An additional 2.4 acres were planted for wildlife to develop riparian buffer.

Clary has shared his woodland management experiences with others by hosting an "annual woods walk" for over 35 years with other landowners and foresters. The Indiana Department of Natural Resources has used his woods for CFM District Forester training, specifically crown competition factor training for thinning walnut.

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Previously Clary received the Sycamore Trails RC&D "Woodland Owner of the Year" award in 1998 and 2012. In 2010 this property was inspected as part of the national Tree Farm System audit as one of Indiana's representative tree farms. Most recently in 2017 the woodland was selected for the Charles Deam District 5 award.

The Tree Farmer of the Year is sponsored by Indiana Tree Farm. Recognition of outstanding professionalism in sustainable forestry practices is one of their objectives. Education is the other objective. Awardees are selected by the Indiana Tree Farm Committee which has 31 members representing a cross section of forestry professionals in the state.

Ken Day is retired Forest Supervisor of the Hoosier National Forest.

Best Science *Continued from page 1*

The Woodland Steward tries to keep you the landowner up to date on the science of the time. We showcase recommendations, provide information and suggest new management techniques. We need to be open to the best science of the time but understand that sometimes it may not work out the way we hope, or it may have unintended consequences, but doing nothing is typically not a good choice either. We included a donation envelope with this issue of the Woodland Steward and hope that you value the Woodland Steward Newsletter enough to help us keep printing and mailing it out three times a year. Thank your for reading and writing to us with questions, thoughts and ideas.

Sincerely,

Dan Shaver

Left: Blacklegged tick: Scott Bauer, USDA Agricultural Research Service, Bugwood.org; Center: Lone star pair: Mat Pound, USDA Agricultural Research Service, Bugwood.org; Right: Dog tick: Susan Ellis, USDA APHIS PPQ, Bugwood.org

Tick-Borne Diseases of Indiana

By Doug Ginder

As spring approaches and we begin to enjoy the outdoors, we'll soon find that ticks have joined the party. Not only are ticks a nuisance, but they can also transmit disease. Therefore, it's important to take precautions to avoid tick bites and the potential diseases they may carry, as tick-borne diseases are on the rise.

There are three ticks that people are likely to encounter in Indiana: *Ixodes scapularis*, the blacklegged tick; *Dermacentor variabilis*, the American dog tick; and *Amblyomma americanum*, the lone star tick. Each tick is most abundant in different parts of the state, and each one carries a different set of diseases.

These ticks have four life stages: egg, larva, nymph, and adult. All three tick species are 3-host ticks, which means that each life stage feeds on a different vertebrate host. When a tick is looking for a meal, it will climb onto vegetation and wait for a potential host to walk by; this process is called questing. Ticks detect a potential host by sensing carbon dioxide, heat, vibration, and other cues.

The blacklegged tick has been reported in 83 counties in Indiana, with the highest abundance in northern Indiana. The main threat from blacklegged ticks in Indiana is Lyme disease, caused by the bacterium *Borrelia burgdorferi*. Both adult ticks and nymphs can transmit *B. burgdorferi* to humans, but nymphs are the primary vector due to their small size, and are most active from May to July. Adult blacklegged ticks are active beginning in fall and can even be active on warm days throughout the winter and into spring. Larvae feed on small rodents, which are the wildlife reservoir for Lyme disease. Blacklegged ticks are most likely found in dense wooded areas that hold moisture around the ground level, because these smaller ticks are more vulnerable to drying out. There were 153 human cases of Lyme disease in IN in 2018, with most cases occurring in the northwest part of the state. Blacklegged ticks can also transmit babesiosis and anaplasmosis, which are rare in Indiana, and Powassan virus, which has not yet been detected in Indiana.

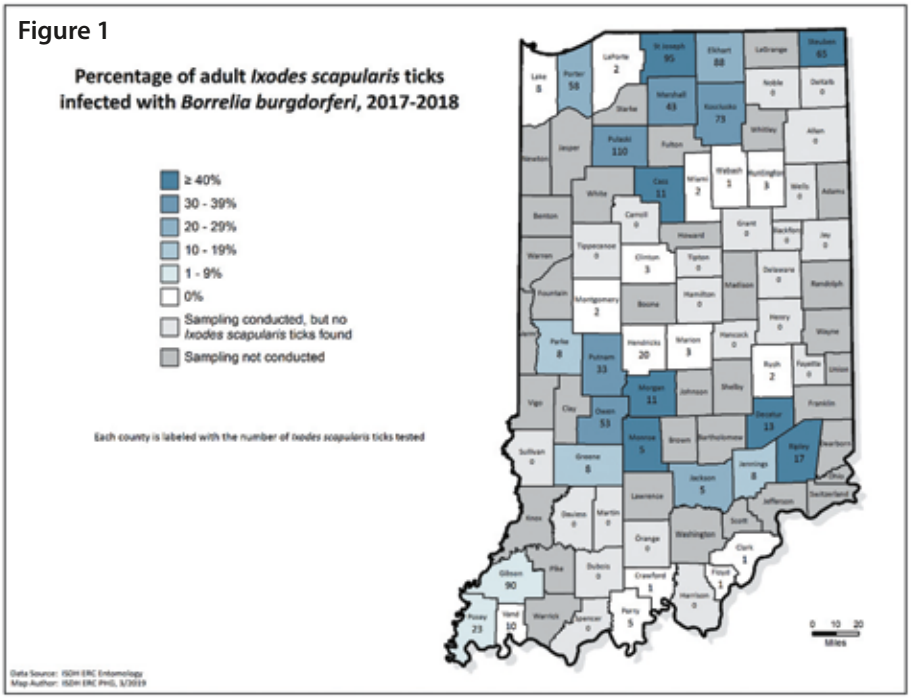
The American dog tick is found throughout the state and is capable of transmitting a group of diseases called the spotted fever rickettsioses (SFRs), with the most famous being Rocky Mountain spotted fever. The dog tick is a large, hearty tick commonly found in tall grass and brush. The immature

stages can pick up RMSF from small rodents, but only adult dog ticks feed on humans. Therefore, only adult ticks can transmit the disease to humans. In Indiana there were 79 human cases of SFR in 2018 and 94 in 2017, which were large increases from previous years. Tularemia, a bacterial infection associated with rabbits, can be transmitted by the American Dog tick and the lone star tick, but is rarely reported in Indiana.

The lone star tick can be found in various areas throughout the state, but is found in higher abundance in the southernmost third of the state. All three life stages will feed on humans, and people often refer to immature stages as "turkey ticks or turkey mites." Lone star ticks can transmit ehrlichiosis, a bacterial infection for which white-tailed deer are the reservoir. Both nymphs and adults play a role in transmission. There was a large increase in human ehrlichiosis cases in Indiana during 2018, with 74 cases compared to a previous high of 49 in 2014.

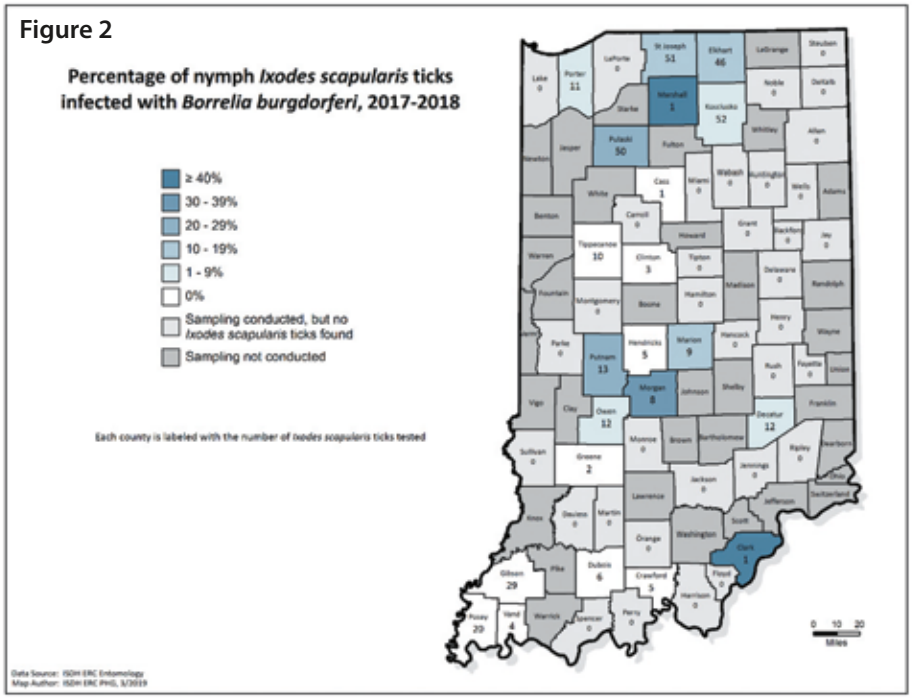
Most of the tick-borne diseases above present with flu-like symptoms, such as fever, muscle aches, and possibly a rash. A characteristic symptom in Lyme disease is an erythema migrans rash (commonly called a bulls-eye rash), but not all people will have this symptom. Most of the tick-borne diseases common in Indiana are easily treated with antibiotics; however, Rocky Mountain spotted fever and ehrlichiosis can be extremely severe, and even fatal, if not diagnosed early and treated appropriately. If you begin to experience flu-like symptoms during the spring, summer, or fall and have a recent history of outdoor activity, make your doctor aware, even if you don't remember having a tick bite.

Figure 1



Currently ISDH is conducting surveillance for Lyme disease in ticks throughout the state. Questing ticks are collected by dragging a heavy sheet of cloth over vegetation and then tested for Lyme disease at the Centers for Disease Control and Prevention. These results provide information on where *Borrelia burgdorferi* has been detected in adult (Fig. 1) and nymphal (Fig. 2) blacklegged ticks in our state. The number of ticks that were tested in 2017–2018 are provided for each county. Please note that infection percentages in counties with a small sample size (fewer than 50) should be interpreted with caution. These maps will be regularly updated as ISDH collects and tests more ticks. For more information on ticks and tick-borne diseases please visit our website: *https://www.in.gov/isdh/27792.htm*

Figure 2



Doug Ginder is a vector-borne epidemiologist working for the Indiana State Department of Health (ISDH).

Protect Yourself this Season

By Brian MacGowan

Tick exposure can occur year round, but folks should be particularly aware when they are most active during the warmer months of April through September. Avoiding contact with ticks during this time is preferable. However, for most woodland owners and nature enthusiasts, the warmer months are some of the best times to enjoy woodlands and the outdoors.

The Center for Disease Control has the following recommendations before you go outdoors:

- **Know where to expect ticks.** Ticks live in grassy, brushy, or wooded areas, or even on animals. Spending time outside walking your dog, camping, gardening, or hunting could bring you in close contact with ticks. Many people get ticks in their own yard or neighborhood.
- **Treat clothing and gear** with products containing 0.5% permethrin. Permethrin can be used to treat boots, clothing and camping gear and remain protective through several washings. Alternatively, you can buy permethrin-treated clothing and gear. I've been told some folks spray their truck seats and floorboards with a permethrin-based product to avoid those pesky lingering ticks that get on you the day after being in the field.
- **Use EPA-registered insect repellents** containing DEET, picaridin, IR3535, Oil of Lemon Eucalyptus (OLE), para-menthane-diol (PMD), or 2-undecanone. EPA's helpful can help you find the product that best suits your needs. Always follow product instructions.
    - Do not use insect repellent on babies younger than 2 months old.
    - Do not use products containing OLE or PMD on children under 3 years old.
- **Minimize Contact with Ticks**
    - Avoid wooded and brushy areas with high grass and leaf litter.
    - Walk in the center of trails.

After you get back home from the field, be sure and check your gear, clothing and body for ticks. Tumble dry clothes in a dryer on high heat for 10 minutes to kill ticks on dry clothing after you come indoors. If the clothes are damp, additional time may be needed. If the clothes require washing first, hot water is recommended. Cold and medium temperature water will not kill ticks.

Ticks can be anywhere on your body, but spots of particular note include the hair on your head, in and around the ears, under the arms, around the waist, inside the belly button, between the legs, and the backs of the knees. You will need a hand-held mirror or full-length mirror to view many of these areas.

Shower soon after being outdoors. Showering within two hours of coming indoors has been shown to reduce your risk of getting Lyme disease and may be effective in reducing the risk of other tickborne diseases. Showering may help wash off unattached ticks and it is a good opportunity to do a tick check.

If you do find a tick on your body, properly remove by using tweezers to grasp the tick as close to the skin surface as possible. Pull upward with steady and even pressure. After removal, clean the area with rubbing alcohol or soap and water. Dispose of a live tick by putting it in alcohol, placing it in a sealed bag/container, wrapping it tightly in tape, or flushing it down the toilet.

For more information about ticks and tick-borne diseases, visit the CDC website, *https://www.cdc.gov/ticks/index.html.*

Brian MacGowan is an Extension Wildlife Specialist with Purdue University's Department of Forestry. He also has served as secretary and editor for the Woodland Steward since 2008.

About a Woods *Continued from page 11*

bd.ft. Doyle. Fifty of these trees were hickory, and the other 49 were again mostly lower quality oak trees. I again did TSI after the harvest completing regeneration openings and doing crop tree release. The income from this sale after consulting forester TSI and sale costs were deducted was $3,934 or $375/acre.

After this second harvest was completed, in 1997 I did my second 100% inventory of the merchantable timber and found 4,923 bd.ft./acre having a value of $2,277/acre. The beginning 1980 volume had been 5,320 bd.ft./acre with a value of $1,010/acre. That worked out to a growth rate of 224 board feet per acre per year, which is a volume growth rate of 3.5% per year. The value per acre was $2,277/acre or 2.25 times greater than the beginning value. After 16 growing seasons and two timber harvests I was just 400 bd.ft. per acre below my beginning timber volume, but my timber quality, species mix, and timber value were now much better.

Inventory	Trees per acre	Board-feet per acre	Value ($) per acre	Percent hickory in woods	Annual growth (bd-ft per acre)
1981	29.3	5,320	1,010	35%	-
1997	33.1	4,923	2,277	6%	224
2017	40.6	10,190	8,490	5%	263

In 2017 I did my third 100% inventory of all merchantable trees. It had been 20 growing seasons since the last inventory with no timber harvested in between. The timber volume went from 4,923 bd.ft. per acre in 1997 to 10,190 bd.ft. per acre in 2017. That works out to 263 bd.ft. per acre per year, for an improvement of nearly 40 bd.ft./ac/yr. from what it was during the first 16 years of my ownership. The species mix had gone from 35% hickory in 1980 to 6% hickory in 2017. Black Cherry (23%), White Oak (21%), Black Walnut (16%), Red Oak (10%), and Burr Oak (10%) were now the main species. My appraisal of the timber value went from $1,010 per acre in 1980 to $8,490 per acre in 2017, and that is after $754 per acre had been sold in the two timber sales. Considering 2017 timber values, and the current tree species and timber quality in this woods, the current growth rate of 263 bd.ft. per acre per year works out to $219 per acre per year of timber growth.

After the 2017 inventory, I conducted my third timber sale. I sold 119 trees having 41,640 bd.ft. The main species in this sale were white oak, black cherry, red oak, burr oak and walnut. Trees were selected based mostly on economic and biologic maturity, and with the idea that the next sale would be in 10 years. I would call this a fairly high-quality sale, which included 3 white oak and 3 black walnut that I estimated to have veneer quality. After deducting the consulting forester sale costs, the income was $33,590, or $0.80/bd.ft. That is a long way from the 1981 sale that got $0.16/bd.ft. That is an increase of 5 times the value per bd.ft. received because of increases in timber prices over time, and an improvement of the species mix and timber quality sold. This is strong evidence that good timber management pays.

Timber Harvest	Trees removed per acre	Board-feet removed per acre	After cost income ($)	Percent hickory removed
1981	6.3	1,848	278	53%
1995	9.4	2,133	375	50%
2017	11.3	3,965	3,199	

This woods has been a good investment. If you factor out the land value and just consider the timber values, my 1980 to 2017 investment has earned an annual compound interest rate of seven percent per year, which I think is quite good. I also think this case study makes a strong statement for the value of good timber management because a 35% stand of hickory and defective oak would not have come close to these earnings.

Bruce Wakeland ACF, CF has 45 years of professional experience as a forester in Indiana. He currently owns and operates Wakeland Forestry Consultants.

Permanent Forest Openings Provide Early Successional Habitats

By Richard Winstead

All wildlife species have the same four basic habitat requirements – food, water, shelter, and space. However, each species requires different kinds and combinations of food or shelter. Successful wildlife management requires an understanding of how specific land management treatments affect individual species. In most cases, habitat management should emphasize the community occupied by a species rather than focus only on a single target species. A healthy community benefits multiple species – both game and nongame.

If left undisturbed, non-forested lands (in areas that were previously comprised of forests) typically undergo a predictable series of vegetation growth stages, eventually becoming mature forests again. Each stage, from annual grasses and forbs, to brush, to mature forest, benefits certain types of wildlife. In forests, wildlife habitat conditions shift in response to changes in age, structure, size, and species composition. As a result, the assemblage of wildlife species inhabiting the area typically shifts as the land moves through each successional stage.

Openings in the forest canopy occur naturally due to overstory tree loss from insects, fire, storms, age and disease. As succession begins, these openings will become occupied by a mixture of tree seedlings, shrubs, grasses, and/or forbs that contribute to the diversity of the forest. These early successional forest stages are rich in insects, berries and seeds. They also provide cover making them valuable habitat for many species of wildlife including deer, turkeys, ruffed grouse, rabbits, mourning dove, songbirds and American woodcock.

Permanent forest opening comprised of young trees.

During their first 4-6 weeks of life, ruffed grouse chicks feed exclusively on insects found in early successional areas.

Studies have shown that early successional grassland and forest habitats have declined throughout most of eastern North America due to changes in land use practices. In southern Indiana, forests have matured and fire disturbances have lessened. Nearly 60 percent of forestland in our region is 40 to 80 years old, but only eight percent of forestland is 20 years or younger. Predictably, the species that depend on these habitats for food, cover and nesting have declined as well. For example, since 1983 Indiana has lost over ninety-five percent of its ruffed grouse population and their hunting season has been suspended since 2015.

To help reverse these trends, the Hoosier National Forest (NF) in south central Indiana has an active early successional habitat management program that maintains about 4,250 acres as 718 permanent forest openings. The sizes of the openings varies from one quarter acres to 110 acres. The average size is 6 acres. Some openings are maintained as warm-season grasslands, some as shrublands, and others as wildflowers for pollinators. They are maintained by methods such as mowing and burning to prevent the re-establishment of trees. This differs from clearcuts where trees are expected to grow back. Clearcuts provide temporary early successional habitat lasting perhaps 10 years.

In areas managed as grasslands, Forest Service staff encourages or establishes native warm season grasses that actively grow during the hotter months when most cool season grasses are dormant. Because they grow in erect clumps, open space at ground level is

provided when bunches are not too dense, allowing mobility for small wildlife. The structure of native warm season grass stands allows a diverse community of forbs such as legumes and wildflowers to exist between grass clumps, which create an ideal environment for grouse, quail, and turkey to forage and raise young. During winter, fields of native warm season grasses are magnets for rabbits, over-wintering songbirds, and deer. This can be especially critical for small wildlife at a time when quality cover is at a premium.

In 2018, 2,760 acres of permanent forest openings were treated through mowing or prescribed fire, and 20 acres were seeded with native herbaceous plants. Ideally, treatments of individual openings occur at three to four year intervals to set back woody plant growth.

The Central Hardwoods Joint Venture (CHJV), a partnership of state, federal, and non-profit wildlife conservation agencies and organizations, works to insure the long-term viability of native bird populations across the Central Hardwoods Bird Conservation Region. The region includes southern Indiana along with parts of Alabama, Arkansas, Illinois, Kentucky, Missouri, Oklahoma, and Tennessee. They have classified 21 grassland and shrubland birds as priority species due to regional conservation concerns. Fifteen of these are likely to occur year round or during summer breeding season in the vicinity of the Hoosier NF. Two species may be migrants in our area.

Purdue University has a multi-year agreement to conduct breeding bird surveys on the Hoosier NF. During May and June 2016, the first efforts to specifically survey birds in early successional habitat areas were done. Birds were counted at 311 points within 11 distinct areas. Surveyors recorded a total of 3,802 observations and documented the occurrence of 88 species of birds, including all but one of the CHJV priority species. Priority species field sparrow, yellow-breasted chat, prairie warbler, and Henslow's sparrow accounted for 30% of the total observations. All of these species, except Henslow's sparrow, were present at all 11 survey areas. Because of Henslow's sparrow's habitat requirements, they were only present at seven survey areas that contain a large grassland component. This sparrow is a state endangered species.

Early successional plant communities provide habitat for pollinators such as native bees and butterflies. Areas having a large grassland component like the one in this photo also support Henslow's sparrows during the summer breeding season.

Large grassland forest opening.

As one of the largest public land holders in Indiana, the Hoosier NF plays a major role in providing forest ecosystems that enhance biological diversity on a regional scale. Since the majority of land in Indiana is privately owned, individual landowners play an important role in providing habitat diversity too. If your woodland management goals include hunting, wildlife viewing, photography, or increasing habitat and wildlife diversity, consider implementing and maintaining permanent forest openings.

The Hoosier NF acknowledges our many partners - Ducks Unlimited, Indiana Department of Natural Resources, National Wild Turkey Federation, and Quail Unlimited, without whom we could not develop and maintain wildlife habitats on the forest.

Richard Winstead is the supervisory wildlife biologist, and Marion Mason is the public affairs specialist for the Hoosier National Forest.

Terrestrial Invasive Species Rule Update

By Kyle Daniel

The Invasive Terrestrial Plant Rule was signed by Governor Holcomb and published on March 18, 2019. The rule goes into effect 30 days after publishing, so it will be effective later in April. The rule states with respect to the 44 plant species included on the rule:

"a person must not:
(1) Sell, offer or grow for sale, gift, barter, exchange, or distribute a species;
(2) Transport or transfer a species; or
(3) Introduce a species.
(4) Subdivisions (1) and (2) of this subsection are effective one year after the effective date of this rule."

Note that section (3) "Introduce a species" is effective immediately (around April 16, 2019).

Selling, offering, distributing and transport doesn't go into effect until April of 2020, so nurseries will have some time to sell down their stock. This is an important component of the rule to minimize economic loss to nurseries that grow and/or sell the few commercially available species that are on the list. Currently there is no mandate to eradicate existing plantings in nurseries, landscapes, or forested areas.

What is an invasive species?

An Invasive Species is defined in Executive Order 13112 as "an alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health." These species often change their habitats by outcompeting native species for the resources needed to survive. The result is loss of diversity and degradation of natural habitats.

What damage do invasive species do?

Invasive species often displace native species, reducing diversity and degrading the habitats in which they have been introduced. These invaders have negative effects on property values, agricultural yields, public utilities, recreation, and tourism. In addition, Indiana landowners and managers spent over $5 million controlling invasive plants in 2012 according to a survey by the Indiana Invasive Species Council's Invasive Plant Advisory Committee. The economic impact of invasive species globally has been estimated at 5% of GDP which in Indiana approaches $15 billion.

Kyle Daniel is a Nursery and Landscape Outreach Specialist with Purdue University's Department of Horticulture and Landscape Architecture.

The following are prohibited invasive terrestrial plants and are declared pests or pathogens regulated under this section:

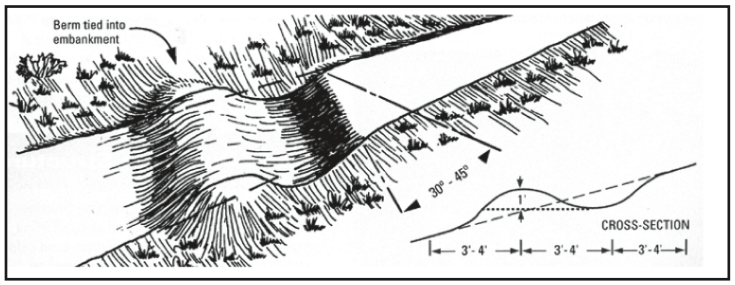
Achyranthes japonica (Japanese chaff flower)
Ailanthus altissima (tree of heaven)
Alliaria petiolata (garlic mustard)
Alnus glutinosa (black alder)
Artemisia vulgaris (mugwort)
Arthraxon hispidus (small carpgrass)
Berberis thunbergii (Japanese barberry)
Carduus acanthoides (spiny plumeless thistle)
Carduus nutans (musk thistle)
Celastrus orbiculatus (Asian bittersweet)
Centaurea stoebe (spotted knapweed)
Cirsium vulgare (bull thistle)
Conium maculatum (poison hemlock)
Convolvulus arvensis (field bindweed)
Coronilla varia (crown vetch)
Dioscorea polystachya (oppositifolia) (Chinese yam)
Dipsacus fullonum (common teasel)
Dipsacus laciniatus (cut-leaved teasel)
Elaeagnus umbellata (autumn olive)
Euonymus fortunei (wintercreeper)
Euphorbia esula (leafy spurge)
Frangula alnus (glossy buckthorn)
Hesperis matronalis (dame's rocket)
Humulus japonicus (Japanese hops)
Lepidium latifolium (pepperweed)
Lespedeza cuneata (sericea lespedeza)
Ligustrum obtusifolium (blunt-leaved privet)
Lonicera japonica (Japanese honeysuckle)
Lonicera maacki (Amur honeysuckle)
Lonicera morrowii (Morrow's honeysuckle)
Lonicera tatarica (Tatarian honeysuckle)
Lonicera x bella (Bell's honeysuckle)
Microstegium vimineum (Japanese stiltgrass)
Morus alba (white mulberry)
Phalaris arundinacea (reed canarygrass)
Phellodendron amurense (Amur cork tree)
Phragmites australis subspecies australis (common reed)
Polygonum perfoliatum (mile-a-minute vine)
Reynoutria japonica (Japanese knotweed)
Reynoutria sachalinensis (giant knotweed)
Reynoutria x bohemica (Bohemian knotweed)
Rhamnus cathartica (common buckthorn)
Vincetoxicum nigrum (black swallow-wort)
Vincetoxicum rossicum (pale swallow-wort)

Ask the Steward

By Dan Ernst

Question: I've never been to a water bar. Where can I find one?

Answer: You've come to the right place. I've been to quite a few water bars over the years and have actually helped build several- and you can to! As woodland owners with sloping trails and access roads a water bar is an important feature to prevent soil erosion and insure trail sustainability. Waterbars are most often a simple mound of soil, about 12 inches in height, built up diagonally across the road or trail to divert water from the road in small quantities before it can build up force to cause excessive soil erosion. Along the uphill side of the waterbar it is necessary to excavate a shallow trough (12" deep) to help channel water along the water bar, off the trail and onto a stable vegetated area. Spacing of these water diversions is based on slope steepness with a good rule of thumb being to install a waterbar every 6' of elevation change, AND also before roads and trails cross stream channels. While they can be constructed by hand, bladed heavy equipment sure makes the job easier. For extra stability seed and mulch the waterbars to establish good vegetated cover. When selling timber it is strongly recommended that the sale contract include language about best management practices for soil and water conservation- including the required use of waterbars on sloping logging roads and trails. Learn more about waterbars with a simple web search on 'forestry waterbars'.



Drawing from Wisconsin's Forestry Best Management Practices for Water Quality (1995).

Question: The chain brake on my chainsaw broke. Is the saw still safe to use?

Answer: Not in my book! While the saw may still function and even cut wood well, the chain brake is one of the most important safety features on today's chainsaws. And, as many emergency rooms can tell you when chainsaw accidents happens they are not pretty and can be very injurious or deadly. This safety feature protects against dangerous chainsaw kickback by stopping the chain quickly when the brake is triggered under a kickback condition. The chain brake should also be manually activated by the saw operator during saw start-ups and when moving about while not cutting. This helps avoid accidents and injuries by minimizing uncontrolled chain movement. While we are on the safe use of chainsaws- consider these additional must do's. 1) Do use safety gear. This includes chainsaw chaps, gloves, heavy boots, eye, ear and head protection. A 3-in-1 safety helmet with a face shield and integrated earmuffs are a must for me and should be in every woodland owner's safety kit. 2) Don't work when you are tired. Statistics show that accidents increase near the end of the work day after and when fatigued. 3) Don't cut what you cannot handle. There are many dangerous trees in the forest and unless well experienced you should stay clear of them. This includes trees bent over and under stress, trees with dead snags and branches overhead (also known as widow makers), and hollow trees with little solid wood. 4) Keep your saw sharp. Not only will it make work much easier- a sharp saw is a safer saw. They cut straighter, pinches less and reduced fatigue on the operator and the saw. 5) And lastly- work with a buddy and keep each other safe. Across Indiana chainsaw safety classes are periodically offered. Take the time to attend one regardless of your level of experience. And, take your buddy with you!

Dan Ernst is an Assistant State Forester with the Indiana Division of Forestry. He oversees the state forests in Indiana and has authored the "Ask the Steward" column for years. Have a question for the column? Email Dan at dernst@dnr.in.gov.

Days Gone By

Sawmill and home of Mr. Elias Groft, cira 1900. The mill was located near Indian Creek, about one-half mile east of the Old North Bridge in Corydon, Indiana. Photos are courtesy of Mr. Bob Welz, the great, great grandson of Mr. Groft.

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