The Woodland Steward

Promoting the Wise Use of Indiana's Forest Resources

2023 Indiana Consulting Foresters Stumpage Timber Price Report

This report is provided annually and is intended to be used as a general indicator of timber stumpage prices and activity in Indiana. There are many factors that determine the price of any individual timber sale, including tree species and quality, average tree volume, size of sale, ease of operability, access and yarding issues, proximity to markets, region of the State, availability of other timber in the area, number of bidders interested in the sale, season it can be logged, economic forecasts and many more. For this reason, the reported prices should not be considered as a guarantee of the value for any given sale. However, this report can be used as a general trend of timber sale prices and where the range would be for most sales meeting the same criteria. To best market your timber, it is recommended you contact a consultant forester that can gauge your timber value in your area and markets.

To create the report a survey was made of all known professional consulting foresters in Indiana. Sales were reported from all areas of the State. Prices were reported from sealed bid timber sales (not negotiated sales) between a motivated seller and a licensed Indiana timber buyer. The data represents sales from January 1 to December 31, 2023. This survey has been conducted annually since 2001.

Timber Sale Price Survey

Timber sale categories: As in the past, sales were reported in three categories based on quality. A high-quality sale has more than 50 percent of the volume in #2 or better red oak, white oak, sugar maple, black cherry, black walnut or soft maple. A low-quality sale has more than 70 percent of the volume in #3 grade (low or pallet grade) or is cottonwood, beech, elm, sycamore, hackberry, pin oak, aspen, black gum, black locust, honeylocust, catalpa, sweetgum or pine. An average sale is a sale that is neither a high- or low-quality sale.

Survey responses: There were 17 consultants that reported prices this year. This is an increase from the 15 that reported last year and in the range of the 15 to 20 that have reported each year since 2015. Prices were reported from 201 sales which is an increase from the 172 sales from last year but a decrease from the 270 sales reported in 2021. The annual average since 2014 is 272 sales reported. Reported sale volumes increased from 14,261,907 board feet in 2022 to 16,549,728 board feet in 2023, however, that is still less than the 25,049,006 board feet in 2021. The average reported sale volumes have averaged 23,905,579 board feet since 2015. Total sale values, over all three categories, also increased from last years $12,057,263 to $13,873,573 this year.

High quality sales: There were a total of 98 sales reported by 13 respondents in this category. Sale volumes ranged from a low of 3,431 board feet to a high of 727,500 board feet. The average high-quality sale was 83,479 board feet. The median volume was 49,794 board feet. The weighted average of these sales was $1,107/MBF (thousand board feet). This price is up about 2% from last year's $1,086/MBF and about 5% below the historical high of $1,164 in 2021. Due to high demand for walnut and white oak, and the wide range in their values, this category typically has a wide range of sale prices. The quantity and quality of

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This publication is funded in part by the Renewable Resources Extension Act (RREA) and made possible through a grant from the USDA Forest Service

Calendar of Events

May 21
Hardwood Tree Log & Lumber Quality Workshop
Morgan Monroe State Forest, $79
RSVP to *info@ihla.org*

May 21
Lincoln Hills Forestry Committee Family Night
RSVP to Karen Smith, *jatsmith1952@psci.net or 812-836-4072*.

May 22
Sycamore Trails Forestry Committee Meeting
5 PM, Iron Skillet Brazil

June 1
National Trails Day
Hoosier National Forest
812-277-6877

June 5
World Environment Day, Starke County Forest
RSVP to Bruce Wakeland 574-298-3242

June 13
Indiana Invasive Species Conference
Brown County State Park
See more at *www.sicim.info*.

June 18
Breakfast with a Forester
8 ET/7CT
Christos Dining, Plymouth

June 25
Oaks- The Trees of Life
Bedford, 6-7 PM
RSVP to 812-275-5692

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

See all forestry and wildlife events for woodland owners at *www.ifwoa.org/events*.

The Woodland Steward Newsletter is published by the Woodland Steward Institute, Inc.

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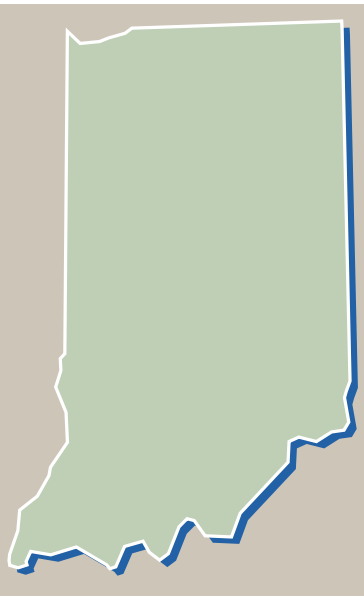

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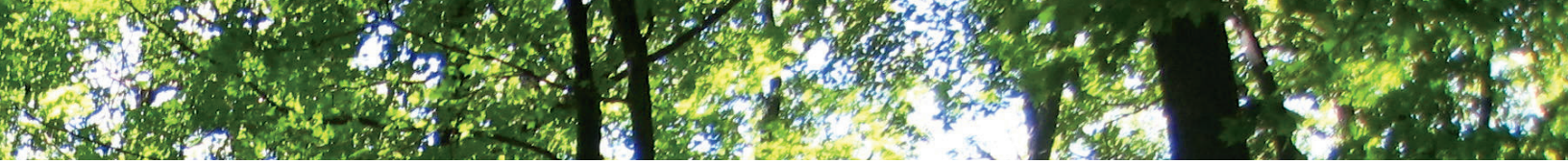

Stumpage Report *Continued from page 1*

Table 1. Summary of reported sales from January 1 to December 31, 2023

	High 98 sales				Medium 85 sales				Low 18 sales			
	BF	Value	Bids	$/MBF	BF	Value	Bids	$/MBF	BF	Value	Bids	$/MBF
Total	8,180,980	$9,054,170	594	$1,107	7,055,671	$4,337,969	384	$615	1,313,077	$481,434	62	$367
Low	3,431	$5,912	1	$352	9,999	$3,500	1	$262	12,339	$3,360	1	$202
High	727,500	$725,075	15	$6,716	339,715	$257,985	12	$1,978	213,398	$77,560	7	$586
Average	83,479	$92,389	6.06	$1,509	83,008	$51,035	4.52	$626	72,949	$26,746	3.44	$378
Median	49,794	$63,024	6	$1,078	66,305	$36,890	4	$541	63,583	$22,270	3	$356

these species in a given sale will determine the value of that sale. Therefore, the range within this group went from a low of $352 to a high of $6,716/MBF.

Medium quality sales: Sixteen consultants reported 85 sales in this category. Sale volumes ranged from 9,999 board feet to 339,715 board feet and averaged 83,008 board feet per sale. The median sale volume was 66,305 board feet. These sales averaged $615/MBF, a nearly 6% decline from last year's historical high $654. The range of prices by sale went from a low of $262 to a high of $1,978/MBF.

Low quality sales: Only 7 consultants reported 18 low quality sales. Sale volumes ranged from a low of 12,339 board feet to a high of 213,398 board feet. The average sale was 72,949 board feet and the median volume was 63,583 board feet. The sale prices ranged from a low of $202/MBF to a high of $586/MBF and averaged $367/MBF. This is a nearly 13% decline from the $420/MBF in 2022, which was also a historical high for the category.

Survey Response Discussion

Volume of timber sold: Since the survey only catches a voluntary sampling of the timber sales occurring across the state, the number of reported sales cannot be definitively used to indicate an increase or decrease in the total number of sales or volume of timber being sold. In 2023 the numbers of sales, total harvest volumes and total sale values were all slightly increased over 2022 but still less than the historical averages. Consultants are still indicating, as they did last year, that they are having fewer sales due to a combination of increased workload in other areas of their businesses, mainly invasive control and TSI; and prices dropping after the unprecedented price spike of 2021 and early 2022. The general feeling seems to be that landowners and foresters are being more selective in the sales they are offering, particularly sales with low quality timber.

Value of timber sold: In 2022, there was a sharp difference in the prices for the first half of the year in comparison to the second six months. The survey showed that for all three categories, prices actually increased in the first six months of 2022 from the record highs of 2021. Prices then took a significant decline in the second half of 2022 with the averages for the year being near, or in the case of the medium and low-quality sales, setting new highs over the prices for 2021. For 2023, prices appear to have rebounded from the second half declines of 2022 though falling short of the highs of 2021 and 2022. In 2023 high quality sales averaged $1,107/MBF, well above the 2022 second half average of $831/MBF and slightly above the $1,086 for the entire 2022. Medium quality sales in 2023 averaged $615/MBF, above the 2022 second half $581/MBF but short of the historic high of $654/MBF for the year. Low quality sales for 2023 averaged $367/MBF. This is above the $334/MBF in the second half of 2022 but well short of the $420/MBF for the all of 2022. It is important to note that even though all three categories are below the record highs, they are still well above any prices reported prior to 2021. See Figure 1 for the annual prices.

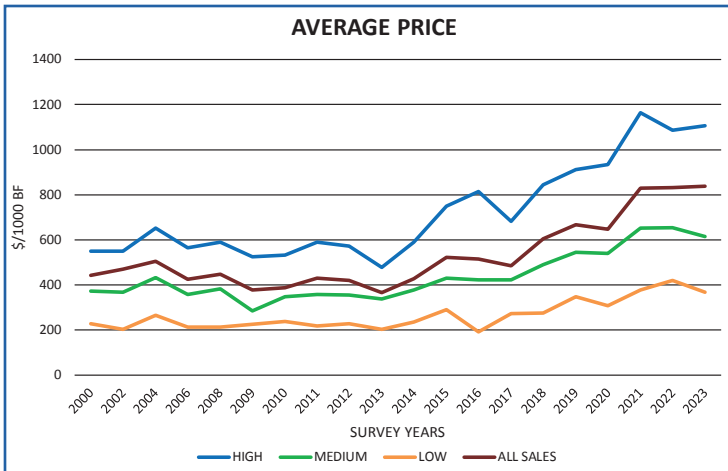

Figure 1. Average sale price by year and category in $/1000BF.

Median values: In contrast to averages, which can be skewed by extremely low or high values, median values are often a better indicator of timber value trends. The median values in 2023 tell a similar but slightly different story than the average prices do. For 2023 the median timber sale value for a high-quality stand was $1,078/MBF. This is very close to the average price of $1,107/MBF and an about 5% increase over the 2022 median value of $1,026/MBF. This indicates a similar trend as the average values of a strong demand for quality timber. The median value for medium-quality sales for 2023 was $541/MBF. This is significantly less than the $615/MBF in the average sale and a 12% decline from the $614/MBF median price in 2022. For low-quality sales, the 2023 median price is $356/MBF. This is close to the $367/MBF average price but as in the case of the medium-quality sales, also a steep decline from the 2022 median price of $469/MBF. The declines in the medium and low-quality sales (12% and 24% respectively) may indicate lower values for those quality of sales despite an increase in the numbers of bidders for those sales (see next section). However, these prices need to be kept in the perspective that the 2023 median prices for all quality categories are higher than any median prices reported before 2019. See Figure 2.

Sale bids: Across all of the sale categories there were a total of 1,040 bids received for the 201 timber sales. This is an average of 5.17 bids per sale. This is an increase from 2022's 4.42 bids per sale and comparable to the historical average of 5.07 bids per sale. However, it is less than the average from 2018 to 2022 of 5.42 bids per sale. For high quality sales the average number of bidders was 6.06. This is an increase over the 2022 5.30 bids per sale and not far off the historical average of 6.18 bids per sale. Medium-quality sales in 2023 averaged 4.52 bids per sale. This is an increase from the 3.93 bids per sale in 2022 and close to the 4.59 bids per sale for the historical average, but well short of the high of 5.67 bids per sale in 2019. Low-quality sales in 2023 averaged 3.44 bids per sale. This is an increase from the 3.00 bids per sale in 2022 and over the 3.19 bids per sale historical average. However, the number of bidders for low-quality sales was as high as 3.55 bids per sale as recently as 2021. See Figure 3.

Conclusions: Despite an increase in the number of sales reported, consultants are still reporting conducting fewer sales than normal due to doing other types of forestry work. They also report they are being cautious with sales that don't have walnut or white oak due to lower prices. However, according to the survey, prices in all three categories bounced back in 2023 from the drop in the second half of 2022. While prices have not returned to the highs of 2021 and the first half of 2022, historically they are still strong numbers. This is especially true for high quality sales where prices are only off the record price in 2021 by less than 5%. The average price for medium quality and low-quality sales were off about 6% and 12.5% respectively from the highs set in 2022. Despite the lower prices for medium and low-quality sales, the number of bidders for

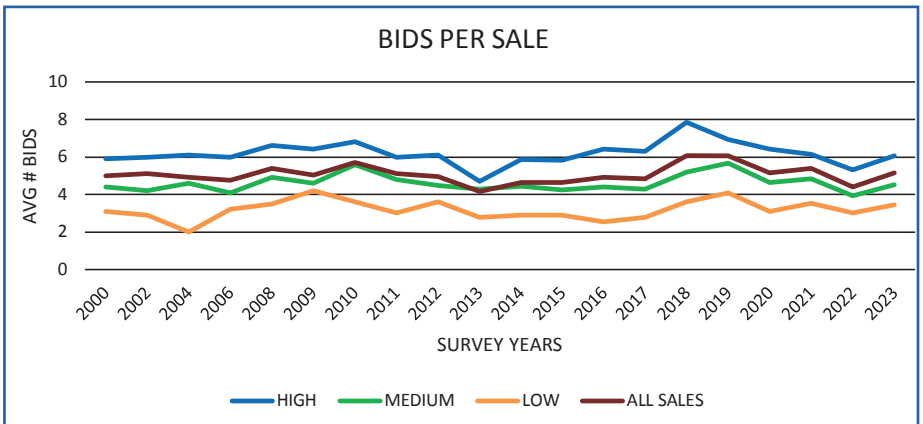

Figure 2. Median sale price by year and category in $/1000BF.

those sales increased. This may indicate steady markets for that type of material but at lower than historically high prices. Landowners and their consultants need to consider whether to sell low and medium quality sales during historically strong prices or wait for higher prices that may or may never return.

Consultant Comments and Other Thoughts

Note: These comments are the opinions of individuals from different parts of the State and with different markets. They may or may not be relevant to your situation. You should always discuss timber marking and marketing with your consultant to get the best information relating to your timber management.

- Overall, prices held very steady throughout the year. Most of the sales brought a fair number of bidders but that is always determined by location, access, etc. One Amish logger bought 3 of the larger sales otherwise was pretty spread out amongst the common buyers in our area.
- We keep being told these prices are not reflective of what is going on in the market…but they've been saying that all year.
- I had EQIP contracts flowing out my ears that consumed most of my time, forcing me to turn down a few marking jobs for landowners that couldn't wait.
- Prices weren't overly good, so I've decided to hold off on a few to hopefully get a better price later (for those landowners who don't mind waiting a little while longer).
- I ran into something this year, more so than in previous years. I found myself planning a harvest in amongst an EQIP contract that hasn't been funded yet. For example: I've prepared at least three plans where I want to do at least 1 year of Brush Management (or two), have a timber sale, and then follow it up with Forest Stand Improvement. It creates some scheduling conflicts, but I believe it works well. That said, I have sales planned in the coming months/years, but am waiting on NRCS to determine how best to proceed.
- The second half of the year saw more buyer interest on the stumpage/sale side in our area, however I believe prices did not change significantly over the course of the year, just number of bids.

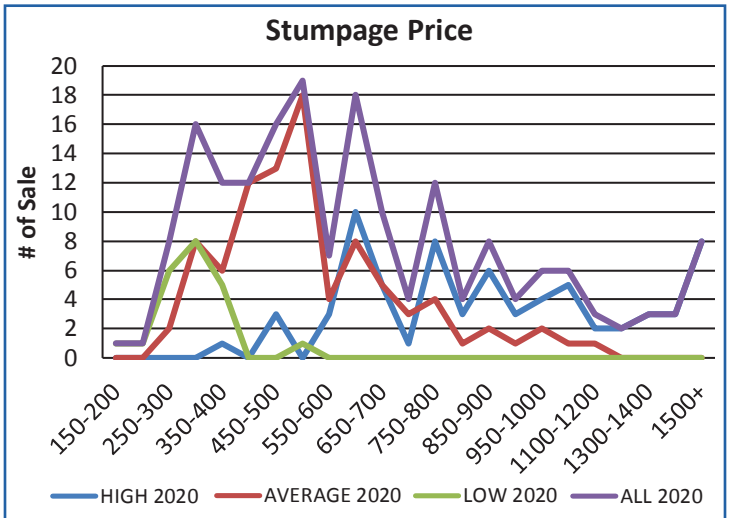

Figure 3. Average number of bids by category and survey year.

- We have a few buyers who consistently pay higher prices for sales including white oak and black walnut, regardless of the rest of the market. Other species, like maple seemed to struggle all year so we avoided selling much.
- We have been struggling to keep up with the demand for Invasive control work and still keep up with calls for timber sales. We made a point to actively pursue timber sales this year, even if it meant putting off invasive control work, as we hardly sold any timber in 2022 (a good year). This led to more stress and a few unfinished projects that needed extensions or follow up work over the winter, but it was worthwhile.
- This was historically a decently strong year in terms of sales and a high proportion of the sales were higher quality. We are continuing to get requests for appointments to sell timber for new clients, as well as old ones who are now 10-12 yrs out from the last sale. We are also continuing to get several bids on most of our sales and buyer interest is consistent, even with lower grade timber in most cases. We anticipate moderating interest rates to provide a boost to housing markets as fears of recession are starting to fade, that should bode well for stumpage prices to stay strong or maybe increase accordingly. 2024 should be better than 2023, generally.

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The Birders' Dozen Profile 7: Eastern Screech-Owl

Dr. Jessica Outcalt, consulting bird biologist

Welcome to the Birders' Dozen! Over the next six issues we are going to continue introducing the last half of the 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."

This tiny owl, most commonly seen poking its head out of a hole in a tree, is a distinctive predator. Unlike many species, the Eastern Screech-Owl does not have a minimum area needed for habitat; its only requirement is a cavity tree for nesting. Despite being relatively general in its habitat selection, some management techniques can help encourage owl residence in a given area, allowing landowners to enjoy its charismatic presence.

Natural History

Though its habitat is relatively general and owls are dependent only on a cavity tree or nest box, this non-migratory bird is also influenced by food availability and adequate hunting habitat. Rodents and songbirds are the screech owl's primary prey, though invertebrates including insects, crayfish, and earthworms are also important. These food items can change seasonally: in the winter, rodents are more commonly consumed, while birds and invertebrates are more common during the nesting season. In addition, mammals are more typical prey in rural areas, but owls can consume more small birds in urban areas.

The Eastern Screech-Owl is a sit-and-wait predator, which means they typically wait on a perch until they see suitable prey and then strike rapidly and silently. Because of this hunting strategy, open subcanopies, thin shrub layers, and small clearings provide ideal habitat. Like most owls, this tiny owl is active primarily at night, but can be active at dawn and dusk as well.

Unlike other owls in North America, the Eastern Screech-Owl displays a unique plumage pattern: two distinct color morphs, red and gray. Red owls are more common in southern parts of their range, while gray owls are more common in the north. Though color may play a role in owls' temperature control (red feathers are less insulating than darker gray ones), the two morphs otherwise act similarly. Owls of each color can breed with one another and each has the same calls.

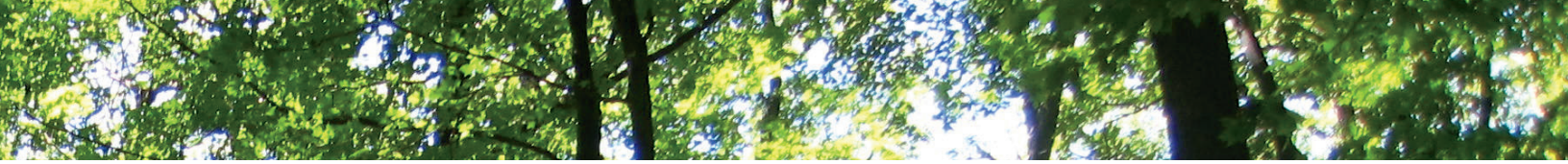
Figure 1. Red morph Eastern Screech-Owl, photo courtesy Matt Williams Nature Photography.

Screech owls are monogamous, and pairs remain mated for life, despite individuals being solitary throughout the majority of the year. Male owls will defend a territory containing at least two or more cavities, from which females choose a suitable option. Natural cavities include hollow trunks, limbs, or woodpecker-created holes, though owls will often use artificial nest boxes. A clutch of 3-4 eggs are laid directly on debris or old squirrel or bird nests, and are incubated for around 4 weeks. After the chicks hatch, they are fed by both parents until they fledge around 4 weeks later. Owl fledglings, unlike songbird fledglings, are dependent on the parents for a long period of time, up to 10 weeks in some cases. If a clutch is successful, nest cavities or boxes will likely be reused in subsequent years.

Habitat Management

Non-migratory and largely solitary, even a small forest patch may support a family of Eastern Screech-Owls. These tiny owls use primarily deciduous woodlots and edge habitats, but can successfully breed in any wooded habitat. Owls sometimes prefer upland and maple woodlands, and use lawns and evergreen woodlands less frequently. Management for screech-owls, then, should include retention of trees with suitable cavities or provision of nest boxes, as well as encouraging open woodlands for hunting.

White-footed mice (Peromyscus leucopus) are important prey items for owls, and mice populations are often tied to acorn (mast) production. Encouraging growth of native oak and other mast-producing tree species can not only provide



roosting and nesting trees but food items for owls' prey as well. When oak growth is coupled with an open understory and other clearings for hunting opportunities, growing owl populations could be sustained.

The most important requirement for Eastern Screech-Owls, however, is simply the provision of a suitable cavity tree or nest box. Owls do not excavate their own cavities, so if no suitable natural cavity—such as one created by another of our target species, the Red-headed Woodpecker—exists, a nest box can be provided. The Cornell Lab of Ornithology's citizen science project NestWatch and the National Audubon Society, both listed in References below, provide useful tips and plans for building your own nest box, as well as suggesting ideal locations within your property.

Conclusion

This tiny but fierce predator is a favorite of many. In my local nature preserve, a pair of screech owls, one gray and one red, have been roosting in the same cavity for over a year. They've become local celebrities among the birding community here, and seeing their faces peek out of the cavity, sometimes both at once, is a captivating experience. Declining owl populations can greatly benefit from management and forest conservation, so that future generations can experience the joy of seeing a tiny owl face peer out of a tree.

Figure 2. Red morph Eastern Screech-Owl roosting in an artificial nest box, photo courtesy Jessica Outcalt.

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.

Jessica Outcalt is the Agriculture and Natural Resources / Community Development Extension Educator with Purdue Extension in Cass County, and has been with Extension since spring 2022. Prior to her work with Extension, she worked with The Nature Conservancy to develop this series of profiles, as well as the pocket guide and assisting with the silvicultural guide for Forestry for the Birds. 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 the scientific process.

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Forest Management is for the Birds!

by Judi Brown

Saying something is "for the birds" can indicate frustration with a situation. But forest management's effect on bird populations is the opposite: forest management truly can be for the birds! The Let the Sun Shine In coalition in Indiana works to encourage bird and wildlife friendly management practices on all of Indiana forestland.

Indiana forest owners keep their goals in mind as they manage their forests. Management goals vary across the spectrum, and can include habitat improvements to benefit wildlife and improve hunting opportunities. Another goal is recreation, including hiking or ATV trails for the enjoyment of the forest owners; or income, using management to improve the quality of the timber. For most forest owners, their goals include a combination of the above, plus several more. And management methods utilized can achieve multiple goals. Managing for wildlife and hunting can also benefit songbirds, timber value, and recreation opportunities. Forest managed for profit still incorporate wildlife and bird friendly practices. All of the management strategies utilized have long-term effects across the entire forest ecosystem.

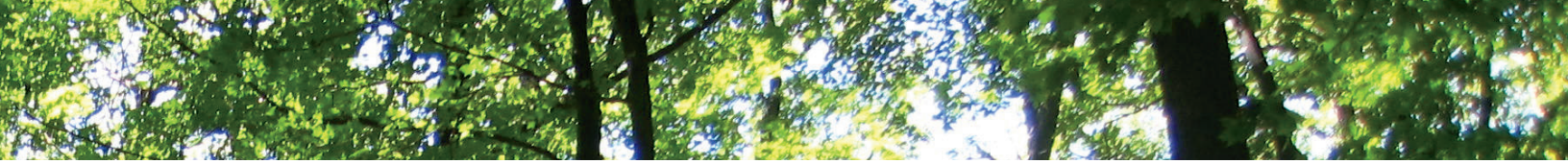
Regular readers of newsletters such as the Indiana Forestry and Woodland Owner's Leaves and Limbs have heard the statistics about the alarming loss of songbird populations around the world. Since 1970, long-term surveys reveal a net loss of 2.9 billion birds in North America. (Science, *https://www.science.org/content/article/three-billion-north-american-birds-have-vanished-1970-surveys-show)*. Conversations among bird watchers include nostalgia for the birds they no longer see or hear, including Eastern Whip-poor-will, Eastern Screech-owl, Red-Headed woodpecker, Wood Thrush, and Cerulean Warbler, among others. But if you live near a well-managed forest, you may be a little surprised by these conversations. The late winter evening air near a forest opening will include the sights and sounds of the woodcocks doing their mating dance. Summer mornings will be filled with the flute-like song of the Wood Thrush, and the evenings with a chorus of "whip-poor-will, whip-poor-will!". So, what is attracting the birds to these areas? Why are the number of birds across North America declining, yet they are seen and heard near our managed forests? The key word here is "managed".

The Changing Forest Composition

Our public forest land is managed for the long term by professional foresters, using the most current science. The foresters managing these properties began noticing changes in the forest composition over recent decades. Areas that were typically oak forests in the 1980's have slowly converted into forests composed of beech and maple trees, and oak trees are no longer successfully regenerating. Research is being done across the Central Hardwoods Region by universities, and, in Indiana, studies are conducted at projects such as the Hardwood Ecosystem Experiment (heeforeststudy.org). The research reveals that continuing to utilize the existing management strategies results in our forest stands becoming more shaded, and forest composition is changing to species that thrive in shaded, moist forests, such as American beech and Sugar maple. This habitat change is part of why songbird populations are in decline.

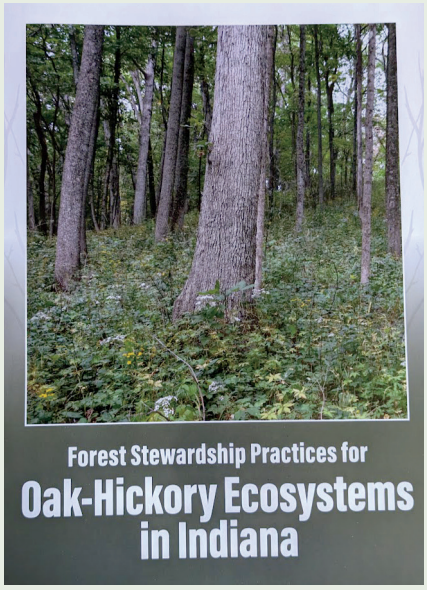
Let the Sun Shine In: Keeping a Mosaic of Forest Types on the Landscape

In response, public forest managers have followed the research and are carefully managing forest stands to allow more sunshine to reach the forest floor. Disturbances to forest canopies, such as regeneration openings, offer opportunities for our sun loving species, such as oak and hickory trees, to receive adequate sunlight to regenerate and grow. Our public



forests now utilize a variety of management strategies that encourage a diverse mix of ecosystems, including the more shaded beech-maple ecosystem and the more sun loving oak-hickory ecosystem. This provides a diversity of forest types: young and old, shaded and open, brushy, and tall and straight. This diversity of food and shelter sources has allowed the songbirds, and wildlife in general, to thrive.

According to the Indiana Division of Forestry's webpage, approximately 162,000 private landowners own approximately 77% of the 4.7 million acres of timberland in Indiana. (Source: Forest Inventory and Analysis Data 2019). In 2018, 3.6 million acres were in private ownership, leaving only approximately 13% of the timberland in public ownership. *The time has come for private forest landowners to continue, or begin, to manage their forests for a diversity of ecosystems across the landscape to support our birds!* If our management strategy is not "for the birds", the decline in our oak-hickory ecosystem and songbird populations will continue.



Resources Are Available

Luckily for the birds, there are resources available to private forest landowners to assist them with their management objectives. One is available through Indiana's Let the Sun Shine In collaboration. Let the Sun Shine In (LSSI) formed in response to the mesophication, or transition of our oak-hickory ecosystems to more mesic beech-maple ecosystems across Southern Indiana. The collaboration of private and public forestry organizations formed to share the message: *if Indiana forestland owners do not follow the science, the oak-hickory ecosystem will continue to disappear, and as a result, our songbird populations will continue to decline.* Over 950 caterpillar species rely on our oak trees as their primary food source (National Wildlife Federation, Power Plants, 4-1-22), making oak trees a keystone species. Removing oak trees from an ecosystem removes the food source for scores of wildlife, and this reverberates through the whole food web.

Let the Sun Shine In Stewardship Guide

A meaningful action that all forest landowners can make is to support the oak-hickory ecosystem, increasing the biodiversity of plants and animals to the benefit of everyone across the state. To this end, LSSI has introduced a guide called Forest Stewardship Practices for Oak-Hickory Ecosystems in Indiana. The District Foresters across Indiana have electronic copies of this guide that they can provide to the landowners in their districts. Printed copies are also available through the District Foresters' Offices across Indiana, and the electronic copy will soon be available on the LSSI collaboration's website. This guide details management strategies that forest landowners can employ in their forests to keep the oak-hickory ecosystem across the Indiana landscape.

Assistance from IDNR District Foresters

The Indiana Division of Forestry now has 20 District Foresters *(https://indnr.maps.arcgis.com/apps/instant/basic/index.html?appid=481c67efabab4b40893fff263494e8f9)* to assist landowners. District Foresters are available to visit private landowners' woods and recommend the best course of action to meet their goals. The District Foresters can advise landowners about state and federal programs that provide technical assistance, property tax incentives, and cost-sharing incentives to assist them with their management strategies.

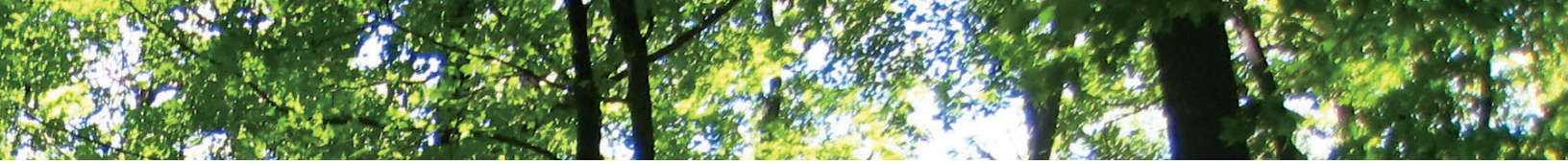
Forestry for the Birds

Another tool in a landowner's forest management toolbox is the Forestry for the Birds program, found on The Nature Conservancy's website, */https://www.nature.org/content/dam/tnc/nature/en/documents/Forestry-for-the-Bird-Pocket-Guide-April2022.pdf.* Forestry for the Birds materials include a pocket guide for landowners in Indiana, which details twelve different bird species, including fun facts about the

Continued on page 11

Stumpage Report *Continued from page 5*

- Logging access is becoming difficult in the northern part of the state in the winter season. We still use crop fields for yarding in many cases, and that's often an issue. The traditional 2-3 week of frozen ground we were used to does not happen anymore. Crews are forced to work in a 2-3 day window in semi-frozen, or drier conditions before the next thaw/rain. Winter cold is unsteady and unpredictable, snow falls on thawed ground and delaying access further. Landowners who were used to frozen logging conditions and smaller skidders in the past are needing to be educated about this and we are adjusting our expectations accordingly. We are seeing a trend of loggers using multiple traditional crews/personnel or mechanized logging equipment to cut jobs in a fraction of the time when weather permits. Trucking then follows as weather allows, with the logging crew on to the next job.
- Mechanized logging is now in use by multiple crews in northern Indiana, and they cut in high volume, moving equipment as quickly as possible. Even smaller jobs are being cut with these machines, but the moving costs are high so the production rate must compensate. District Foresters and consultants often can't make time to do logging inspections before the job is done, in a few days or less. Landowners are not used to mechanized logging, however most foresters are pleased with their work so far. I think many of us believe that it will become an issue when mechanized logging is used by lower skilled operators, but for now only the best/better crews are using it. Obvious differences include: faster production, wider trails, less rutting (generally), tops often crushed/cut into more pieces, tops often grouped in piles, tops and small trees crushed and used as "corduroy" for trails in wet areas to increase flotation/traction. The feller buncher operators are more capable with regards to leaning/hazard trees and clearing temporary yarding areas in woodlands. In some cases, the operators are using small understory trees for traction/bumpers that foresters would normally kill with TSI after harvest.
- Once a crew switches to mechanized logging, they seldom cut trees by hand, less than 10% of the time. Some of the best loggers are still hand-cutting, often at advanced age and working alone or with occasional helpers. I think these older skilled loggers with small-specialized skidders are being hired when the younger inexperienced crews can't manage a challenging project (too wet, veneer trees, bad access, etc.), but they are less productive. There are not enough younger loggers being recruited in our area, and there are even fewer log truck drivers available, so logs sit on landings for weeks in some cases.
- As a forester, I've yet to adjust my marking decisions drastically to adapt to mechanized logging. I have, for oak regeneration purposes, started to shift my sales to more small to large group selection and less single tree selection. These types of cuts are obviously better for mechanized logging, although that was not the goal. I still mark every job such that a traditional hand-cutter/skidder crew can cut it, and I don't plan on changing that. Skidders on the other hand, are now larger by default and I have been marking my main skid trails wider for a few years to compensate. Probably the most important change I need to make is doing a pre-harvest conference with the buyer/logger immediately after the signing of the contract, because I may not make it to the logging job before they are finished.
- This was our lowest number of sales in the last 15 years. We discouraged folks from selling timber in 2023, unless it was predominantly White Oak.
- If any readers of the Woodland Steward know of anyone from 16 years old to 64 years old who are interested in forest management, I firmly believe most consulting foresters could use part-time help or summer internships. The USDA is telling the consultants that they foresee more acres of work to be funded in Brush Management, Tree Planting, and Forest Stand Improvement in the next couple of years. There is a good chance to see spring wildflowers, morel mushrooms in late spring, deer antlers, nice yellow-poplar, sugar maple, white oak, walnut, and hickory and plenty of invasive weeds to spray.
- Landowners who work with foresters and do forest stand improvement and brush management have more high-



quality timber, timber growing at a maximum rate, and have a much better chance of oak regeneration for the future. I have a client in that I have had 3 timber sales on and 55-65% of the stand is white oak and it will be ready for another harvest in about 12 years. This tract also has a nice stand of white oak regeneration that is about 15 years old.

- Once again white oak and black walnut are still moving very well. The rest is hit or miss but demand has been surprisingly good. The white oak market continues to be driven by the stave market (whiskey barrels). Large white oak especially brings higher values even if they are not high-quality trees.
- In southern Indiana large quantities of pine are being sold as there are several different markets available.
- Good stuff almost always sells well but it doesn't mean you should sell it.
- Access and contract terms are important to timber value. Financing flexibility and ease of operations can add thousands of dollars to your sale value.
- Sealed bid sales on marked and tallied timber offered to a wide range of buyers is the only way to make sure you get the best price for your timber on any given day.
- Good or bad timber prices should not be used as an excuse for poor forest management. Planning, waiting for trees to be ready, controlling invasive species and timber stand improvement is still important for the long-term health and productivity of forests and will pay off in the long term.

Professional Consulting Foresters responding to this survey in alphabetical order: Arbor Terra (Mike Warner and Jennifer Boyle Warner), Bear Forestry (Abraham Bear), Cox Forestry Consultants, LLC (David Cox), Creation Conservation, LLC (Brian Gandy), Chris Egloff, Florine Enterprises, LLC (Jake Florine), Gregg Forest Services (Mike Gregg), Habitat Solutions (Dan McGuckin), Haney Forestry, LLC (Stuart Haney), Haubry Forestry Consulting, Inc, (Rob Haubry), Meisberger Forestry, LLC (Matt Meisberger), Multi-Resource Management, Inc. (Doug Brown and Anthony Mercer), Quality Forest Management, Inc. (Justin Herbaugh), Rooted In Forestry, LLC (Mike Denham and Andrew Suseland), Steinkraus Forest Management (Jeff Steinkraus), Turner Forestry, Inc. (Stewart Turner) and Woodland Works (Nate Kachnavage).

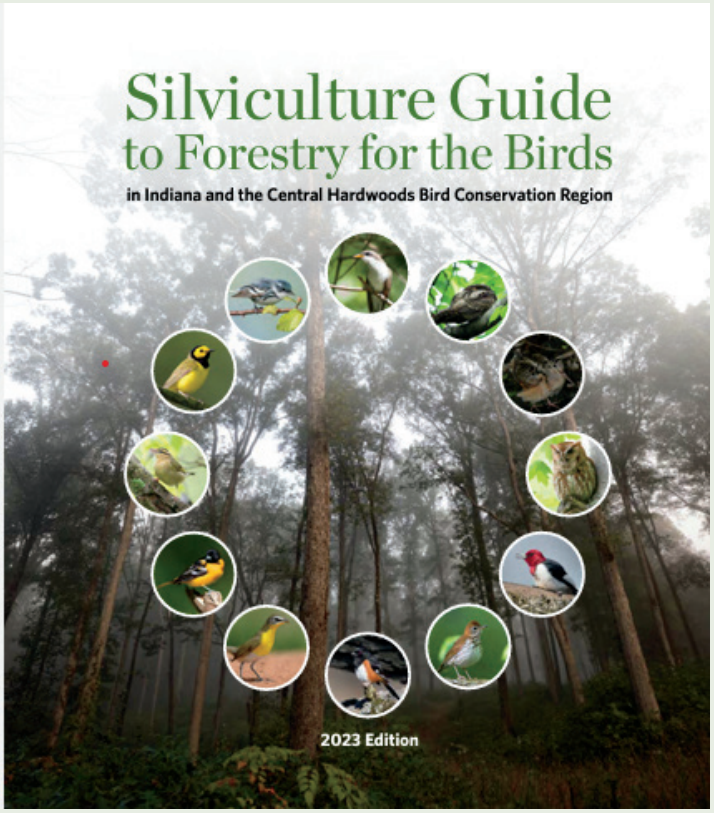
Forest Management is for the Birds! *Continued from page 9*

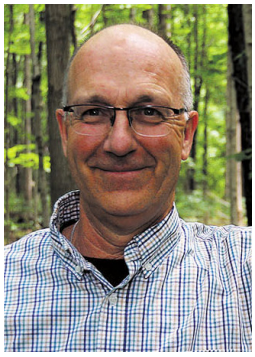
species, where they nest, how to identify them by their song, and management tips to provide habitat for them in your forest.

A companion document is also found on The Nature Conservancy's website, called *Silviculture Guide to Forestry for the Birds (https://www.nature.org/content/dam/tnc/nature/en/documents/TNC-Forestry-for-the-Birds-Silviculture-Guide.pdf)*. This guide goes into more detail about the management practices a landowner can utilize on their forests to benefit the birds, and the entire ecosystem.

Indiana's forest land owners are in a great position to continue to work with their foresters on the best management strategies for their forested land. Not all forest land is suited to be oak-hickory ecosystems. But it is up to all of us to manage our forest land across the entire landscape, help the oak-hickory ecosystem to thrive, and utilize forestry management practices that are for the birds.

Judi Brown works for the American Bird Conservancy as coordinator for Let the Sunshine In - Indiana. Her role is to provide education and outreach opportunities for landowners regarding forest management strategies that encourage the growth of oaks and hickories in our forests.





Ask the Steward

By Dan Ernst

Question 1: I have not seen many squirrels this past winter. Do they migrate?

Answer: Squirrel are not migratory, but populations do go up and down over time based on food availability, predator populations and other stressors. This could be a factor in your area as squirrels possibly relocate or roam a few miles in search of food. Populations will generally rebound within a couple years as food sources recover and squirrel reproduction returns to the normal cycle of two litters/year with 2-3 pups each litter for both Gray and Fox squirrels.

However, there is a very interesting phenomenon noted in historical writings and journals of mass one-way migrations, or more accurately stated, 'movements' of primarily Gray squirrels (the most abundant squirrel species in North America) in the 1800's. Reports describe what would look like an invasion of squirrels marching across the landscape laying waste to crop fields and gardens along the route to who knows where- like lemmings marching to the sea. According to some writings the wave of squirrels could last for days, or weeks as tens of thousands or even millions of squirrels passed through. These extreme mass movements seem to be correlated with major squirrel population booms followed by a year of food scarcity. As September loomed and no food (acorns, hickory nuts…) was to be found squirrels groups began to form and move in search of food, gathering more squirrels as they went. It must have been an impressive site- but to early farmers with ripening crops a potential disaster.

The days of such mass movements have long been gone from Indiana, but similar movements on a much smaller scale may still occur in areas of the eastern United States with vast areas of suitable woodlands. Want to learn more, check out the 'great squirrel stampede' which occurred in central Indiana in 1882.

Question 2: Something has made a row of small ¼ inch, oblong holes in a straight horizontal line on some sugar maples in my woods. Any thoughts of what it might be?

Answer: Your description is a perfect description of damage that can be found broadly across Southern Indiana and much of the Eastern US. Fortunately, it is not caused by some exotic invasive species like the Asian Longhorned Beetle, which can be quite damaging, or any other wood boring insect. The culprit is the Yellow-bellied Sapsucker, a small to medium sized (red capped-yellow breasted) woodpecker, relatively common throughout the southern half of Indiana. As a youth when I heard someone talk of the Yellow-bellied Sapsucker, I thought it was some made up bird with a wild and crazy name- but a name I never forgot. It was not until forestry school that I learned this strange sounding bird was actually real! The sapsucker, much like you say, creates a series of round to oblong holes in straight lines across the tree trunk just beyond the bark and into the cambium (sap) layer of the tree to induce sap flow. The 'sap sucker' then feeds upon the rich, nutritious sap and insects that may be attracted to the sweet treat. They will periodically refresh the wound to keep the sap flowing and even return to the same tree year after year creating new sapwells. Damage is normally non-threatening to the tree, but heavy damage (many rows of sapwells) may open the tree to secondary pests and tree decline. Favored tree species of the sapsucker are those with higher sugar content, including sugar maple, apple, pear and some pine species. Interesting sidenotes: Hummingbirds will also seek out the sapsucker sapwells for nutrition in early spring before other flower sources are available. And, unlike Indiana's other woodpeckers the Yellow-bellied Sapsucker is a migratory species with Southern Indiana being within its' winter range and Canada its' summer range.

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.

Flowering Dogwood

By Lenny Farlee

Flowering dogwood is one of our most attractive small trees here in Indiana with beautiful white spring blossoms and very attractive fall red to maroon foliage. According to Native Trees of the Midwest, George Washington was very fond of flowering dogwood and planted many around his Mount Vernon home.

Flowering dogwood, like many members of the dogwood family has opposite leaf arrangement. The simple leaves originate directly opposite each other on the twigs. The leaves are simple, a single leaf blade. They have an interesting venation pattern in the leaf where the veins, running off the midrib, angle and kind of sweep along the edges of the leaf. The leaf pattern, in addition to being opposite on flowering dogwood, also has the tendency for the outer twigs to arch up somewhat, giving almost a pagoda type look to the tree. This can also be found in some of our other dogwoods and sassafras.

Flowering dogwood flowers are very beautiful in the spring and ultimately will produce this cluster of fruit that will turn red in the fall and is eaten by many birds, tree

squirrels and gray fox. The seeds are then spread by the birds to produce new dogwood plants.

The bark on flowering dogwood is a rough, alligator hide texture and a light to medium gray.

Flowering dogwood is a very popular landscape plant because of its beautiful spring blossoms and great fall foliage. You typically need to be careful where you plant it. It likes good soil drainage, can tolerate some shade, and likes some protection from the wind as well. But, in the right place, flowering dogwood is a fantastic addition to your yard as well as being an important understory tree in our native Indiana forests.

Lenny Farlee is an extension forester with the Hardwood Tree Improvement and Regeneration Center at Purdue University. Prior to the HTIRC, Lenny worked with private landowners as a district forester for the Indiana Division of Forestry for more than 15 years.

The PHiLL Project: A Collaboration of Forest Managers and Researchers to Restore Soils for Pollinator Benefits

By Cheryl Coon, Lauren Pile Knapp, and John Kabrick

Decline of native bees and how enriched log landings and increase habitat.

Native bees are among the most diverse and important pollinators of our forested ecosystems with approximately 4,000 different species in North America. Currently, populations of bees are declining world-wide. A primary driver of bee declines in the eastern and midwestern US is habitat loss, including the loss of open forest habitats with understories of rich floral nectar and nesting resources. Semi-natural habitats such as enriched roadsides and log landings may help to provide the resources needed to sustain bee populations and their important ecosystem service: pollination.

Overview of active forest management and log landings

Log landings, open areas in forests where logs are processed and stacked before being loaded onto logging trucks, are challenged with soil compaction, erosion, residual mulch, logging debris, and invasive species. While landings consolidate the impacts of timber equipment in small, centralized locations, they have little natural regeneration of vegetation afterwards due to the disturbance to the soil surface and the loss of soil structure caused by equipment traffic. To minimize additional impacts across the landscape in the future, these landings are often reused. Although these sites are challenged by the consequences of active forest management, they provide opportunities that may not exist otherwise to increase the availability and abundance of floral and nesting resources for native bees. However, the first step to enriching log landings for pollinators is assessing the degree of soil compaction and mitigating its impact to plant establishment.

Soil compaction as a barrier to plant establishment

The use of heavy machinery for forest operations can result in areas of high soil compaction locally, depending on soil texture and its degree of wetness. For example, southern Indiana forest soils are often silty in texture, and if wet, are highly susceptible to compaction. For this reason, harvesting is ceased when conditions favoring soil compaction are likely. Soil bulk density is closely related to soil compaction and refers to the mass of soil per unit volume. As soils become more compacted, their bulk densities increase as pore space decreases. High bulk densities can impact root growth, water infiltration and storage, gas exchange, and soil health leading to limited native plant establishment and growth. Compacted soils may rebound with time, but with significant compaction, it may take decades to return to similar levels in the neighboring forest. Depending on the degree and depth of the compaction, soil treatments that mitigate the localized impacts of heavy machinery and log decks may be required. Subsoiling or ripping is a common way to reduce soil compaction with minimal disruption of the soil profile. Ripping loosens the soil but otherwise maintains the integrity of soil profile unlike plowing or discing which turns and mixes the soil layers.

Figure 1. Chad Menke, former soil scientist and current fisheries biologist on the Hoosier National Forest, spreads biochar on a log landing to prep it for native plant seeding.

The creation of the PHiLL project

After learning about pollinator declines, a Hoosier National Forest (HNF) forester asked if log landings could be restored for pollinator habitat. He organized other HNF employees to

experiment with different ways to reduce compaction from heavy equipment and establish native vegetation. They tried several methods but were unable to identify a consistent method. The forester, botanist and soil scientist reached out to other National Forest specialists and Northern Research Station scientists to compare issues across the central hardwood region. The discussions resulted in collaborative research initiative called the PHiLL (Pollinator Habitat in Log Landings) project to investigate the establishment of ephemeral pollinator habitat across three National Forests: Hoosier (IN), Shawnee (IL) and Mark Twain (MO).

The PHiLL experiment

Improving soil conditions was a primary objective for the PHILL project. To reduce soil compaction and increase fertility the team of managers and researchers proposed three approaches: 1) ripping compacted soil, 2) ripping compacted soil and adding biochar, and 3) adding biochar without ripping (Figure 1). Ripping in this case was done using 20-inch tines pulled through the soil with a skidsteer (Figure 2). Each National Forest selected five landings to receive treatments, and five landings left to revegetate naturally as controls. Within the soil treatment areas there was a split-plot application of seeding: seeded and not seeded. The seed mix included thirty-one native, generalist plant species adapted to a wide range of site conditions. This was to test whether active seeding increased plant regeneration, biomass and pollinator habitat compared to leaving the area regenerate naturally from surrounding vegetation.

The goal of the PHiLL experiment was to monitor all landings and collect data that could be analyzed to compare the different treatments and produce a management guide for each Forest including the best management practices (BMPs) for establishing pollinator habitat in log landings. Results of this research will also be shared with other forest managers and landowners to describe restoration practices on soils, vegetation and pollinators. It will also result in two master's theses, one PhD dissertation and several peer-reviewed publications.

Figure 2. Research Forester and Project Leader, John Kabrick, assesses the soil after the ripping treatment on the Hoosier National Forest.

What is biochar? Why would we use it for forest soils?

The PHiLL team decided to experiment with the use of biochar to improve soil conditions for native plant establishment because it has high nutrient exchange and water holding capacity (Figure 3). Additionally, it is highly persistent in the soil resulting in long-term carbon storage. Biochar is created by heating carbon rich feedstocks (such as wood debris) in the absence of oxygen. It can either be purchased or it can easily be made onsite. However, the resulting characteristics of the biochar will be dependent on the feedstock used and the temperature it was pyrolyzed at. A biochar was purchased from one distributor and used on all three Forests for consistency.

Figure 3. Image of the biochar applied on treated log landings. This particular biochar product was very finely textured, but some biochar can be very coarse, depending on its feedstock and how it was produced.

What we have learned from our soil mitigation treatments (ripping and biochar)

Implementation of the experiment began in winter 2021 with soil ripping, biochar application and seeding according to the experimental design. Data has been collected on the study sites from 2021 to 2023. Soil data included collecting samples to measure soil compaction, estimates of total and active carbon stocks, pH, cation exchange capacity (soil nutrient holding ability) and the concentration of nitrogen, phosphorus, and other nutrients. Preliminary analysis shows a significant decrease in compaction across all treatments and landings in the upper surface of the soil, with a greater decrease occurring where the biochar was applied with or without ripping. However, at greater depths, soil compaction remains. These results indicate that the application of biochar, particularly along with ripping, can mitigate surface compaction more quickly than leaving the soil untreated.

Cheryl Coon, Forest Botanist, Hoosier National Forest.
Lauren Pile Knapp, Research Ecologist with the USDA Forest Service, Northern Research Station.
John Kabrick, Research Forester and Project Leader, with USDA Forest Service, Northern Research Station.

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