# The Woodland Steward

*Promoting the Wise Use of Indiana's Forest Resources*


## 2017 Indiana Consulting Foresters Stumpage Timber Price Report

This stumpage report is provided annually and should be used in association with the Indiana Forest Products Price Report and Trend Analysis. Stumpage prices were obtained via a survey to all known professional consulting foresters operating in Indiana. Reported prices are for sealed bid timber sales only (not negotiated sales) between a motivated timber seller and a licensed Indiana timber buyer. The data represents approximately 10 to 15 percent of the total volume of stumpage purchased during the periods from April 16, 2016 through April 15, 2017. This report has been published annually since 2001.

The results of the stumpage price survey are not meant as a guarantee that amounts offered for your timber will reflect the range in prices reported in this survey. The results simply provide an additional source of information to gauge market conditions.

**Categories of timber reported:** The prices reported are broken into three sale types—high quality, average quality, and low 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, or black walnut. The low quality sale has more than 70 percent of the volume in #3 (pallet) grade or is cottonwood, beech, elm, sycamore, hackberry, pin oak, aspen, black gum, black locust, honey locust, catalpa, or sweet gum. The average sale is a sale that is not a low quality or high quality sale as defined above.

In the 2008 report some minor adjustments were made in the categories from the previous surveys. White ash was previously included as a component of the high quality sales and hickory was previously in the low quality group. No changes have been made in the categories so the 2017 data should compare well with the data collected since 2008.

### *Sale Activity Stays High*

In 2016-17, there were 310 sales (plus 16 negotiated sales) which is down slightly from the 339 sales (plus 20 negotiated sales) during 2015-16 and down from the record 368 sales (plus 12 negotiated) in 2014-15 (Table 1).

The 15 of 18 consulting firms that reported in 2017 also reported in 2016 and 2015. The three firms that did not report this year only represented six sales last year with 325,318 board feet. Fourteen of the 18 firms have reported every year since 2011. The data from these 14 firms represents 95 percent of the total sales reported, therefore, the data should be very comparable among years.

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**Table 1. Statistical Summary for High, Average, and Low Quality Sealed Bid Timber Sales April 16, 2016 thru April 15, 2017.**

| | High (109 sales) | | | | Medium (168 sales) | | | | Low (33 sales) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | BF[1] | Value | Bids | $/MBF[2] | BF | Value | Bids | $/MBF | BF | Value | Bids | $/MBF |
| Total | 8,089,611 | $5,519,784 | 683 | $682 | 14,928,599 | $6,294,691 | 721 | $422 | 1,682,022 | $457,752 | 92 | $272 |
| Low | 3,767 | $6,095 | 2 | $337 | 7,657 | $2,600 | 1 | $200 | 12,362 | $2,150 | 1 | $106 |
| High | 305,840 | $218,122 | 15 | $8,829 | 511,395 | $385,902 | 11 | $938 | 253,051 | $75,584 | 5 | $458 |
| Mean | 74,217 | $50,640 | 6.3 | $682 | 88,861 | $37,468 | 4.3 | $422 | 50,970 | $13,871 | 2.8 | $272 |
| Median | 50,041 | $35,737 | 6 | $589 | 63,067 | $25,173 | 4 | $389 | 32,997 | $8,324 | 3 | $253 |

[1]BF = board feet [2]MBF = thousand board feet

### IN THIS ISSUE



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# Calendar of Events

**November 4**
*Fall Forestry Workshop*
Froehde Woods, Terre Haute
Register or more info at 812-446-8986 x 3.

**November 10-11**
*Woodland Owner Annual Field Tour and Conference*
Courtyard by Marriott, Lafayette
Contact: ifwoa1@gmail.com or www.ifwoa.org.

**See www.ifwoa.org/events for the latest event information.**

*Overabundant populations of white-tailed deer create browse lines along the edges of woods.*

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**Send inquires or donations to:**
**Woodland Steward Newsletter P.O. Box 36**
**Butlerville, IN 47223**
**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**

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Protecting nature. Preserving life.

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INDIANA

Indiana Association of soil and water conservation districts

ACF 1948
Indiana Association of Consulting Foresters

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## Stumpage Report

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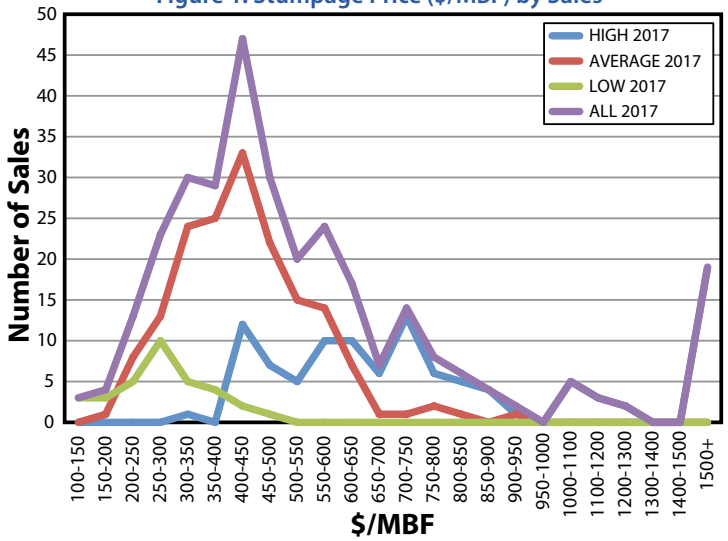
The high number of sales for the last three years (Figure 1) is due to the relatively strong timber markets and an increase in landowners' awareness of forest health concerns, particularly emerald ash borer.

### *Volume of Timber Sold*

The total stumpage volume sold declined to 24,700,232 board feet (plus 983,276 board feet in negotiated sales) which is a drop from 29,044,240 board feet (plus an additional 1,257,863 board feet in negotiated sales) reported last year and a drop from the record high of 36,773,866 board feet (plus 683,235 board feet in negotiated sale) reported in 2015. Historically the average amount sold each year has been around 25 million board feet (with the exception of the recession years in 2009 and 2010). This volume may be an indication of the potential annual workload or capacity of the foresters who have consistently reported their data. The higher volumes reported in 2015 and 2016 may be due in part to sales delayed due to the recession.

The volume for the high quality sale totaled 8,089,611 board feet which is very similar to the 7,728,890 board feet sold last year. The highest total occurred in 2015 when 11,861,259 board feet was reported but only slightly lower than the 8.5 to 8.7 million board feet reported between 2011-14.

**Figure 1. Stumpage Price ($/MBF) by Sales**




The medium quality sales totaled 14,928,599 board feet which is down from 19,782,273 board feet reported last year and down significantly from the 22,606,525 board feet reported in 2015. This volume, however, is similar to the average volume of timber sold since the adjustments were made to the survey in 2008. In 2008, ash was shifted from the high value category to medium value and hickory was shifted from low value to medium value. The impact of the ash has likely had more influence due to the increased amount of ash on the market due to mortality or pending mortality caused by emerald ash borer.

Lower quality sales increased slightly to 1,682,002 board feet from 1,533,077 board feet reported in 2016, but is still down from 2,486,082 board feet and 2,657,366 board feet in 2015 and 2014, respectively. The volume of lower quality sales has generally been around 3 million board feet. The majority of the nearly 1 million board feet sold in negotiated sales would be low quality / value sales, which is why most were negotiated. Part of the decline may also be the result of more ash being on the market which would shift the sales into the medium category.

### *Value of Timber Sold*

Total timber value sold in the 2017 reporting period declined to $12,272,227 compared to $14,939,352 reported in 2016 from the record high of $19,207,898 reported in 2015. Although lower than the past two years, the 2017 value is still nearly as high as any other value reported since the survey began in 2001. The high quality sales brought $5,519,784, the medium quality sales $6,294,691, and the low quality sales $457,752.

### *High Quality Sales Get More Interest*

In 2017, a total of 1,496 bids were received on the 310 sales for an average of 4.83 bids per sale down from 5.14 bids per sale last year but higher than the 4.62 bids per sale received in 2014 and 2015. The high quality sales received 6.3 bids, which was down slightly from 6.43 bids last year but higher than 5.82 bids in 2015 and 5.85 bids in 2014. The 4.3 bids per sale on medium quality sales is also down slightly from 4.4 bids last year and has been very consistent the last several years. The number of bidders on the low quality sales

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# Regeneration Openings – a Forest Landowner's Perspective

*By Brian J. MacGowan and John P. Stambaugh*

Recently, we sat down with Mr. Wendell Leedy who owns 142 acres in Jackson Township, Green County Mr. Leedy's primary management objectives are growing quality timber and secondarily retaining a property for recreation. After acquiring the property in 1990, Mr. Leedy contacted the District Forester who advised him that some regeneration openings would benefit his woods. A local logger created three regeneration openings during November of 1990 through April of 1991. The openings were approximately 4 ac, 1.5 ac, and 0.75 ac in size. Mr. Leedy has also constructed about three miles worth of trails large enough that a small tractor can be driven over them. Several bridges span runs and ravines on the property.

*An example of one of Mr. Leedy's regeneration openings and what they looked like this summer.*

### *What were your initial thoughts when you first heard about regeneration openings and doing them on your property?*

Well, I thought, "Well, this is going to be interesting," because not having a whole lot of experience in forestry prior to that, I thought, "Is this really going to work?" What am I going to see as it proceeds to grow? I was aware and I accepted the explanation that if you don't do this, you're not going to get enough sunlight in these areas to promote a reasonable amount of regeneration of the small plants that are left or the seeds that are in the ground.

### *Did you envision them as large as they were?*

Well, I had no basis to think about the size. And it was really based on the forester's recommendations regarding the size. The forester more or less picked the areas and picked the size. I was wondering about the size, but I think they chose the size based on what else was left that would be surrounding these areas.

### *Can you describe at all some changes you observed in that area in terms of maybe wildlife use or tree regeneration and anything like that?*

The regeneration, I was surprised, turned out very well since it was done and completed in 1991. In about 2011, the regeneration had grown to the extent that I realized that it needed to be thinned. It was very thick with yellow poplar, black cherry, red oak, and white oak. So I went in there and did a thinning based on the concept of what I wanted to retain. I chose the trees to keep based upon looking at the crown and trying to release the area around the selected trees that I wanted to keep (cherry, oaks) – release the crown so that the ones we wanted to keep would get sunlight. Well, that was the concept of pick what you wanted to keep, release everything that's around it within an area that would shade the crown, and thereby promoting the growth of what you wanted.

The presence of wildlife has changed with the respect to the ruffed grouse. It was a reasonable area-- at the time we bought the property, it was a reasonable area for ruffed grouse and they like the thinner forest areas and they like the openings. Now, since things have closed in, the ruffed grouse have disappeared. They are no longer there.

### *Would you reaffirm the use of this practice to neighboring woodland owners?*

Yeah, it's one of the things that a woodland owner should educate himself on and follow those practices. At the time we bought the property, I became a member of the Indiana Forestry and Woodland Owners Association and have been a member since then. For a period of 10 or 12 years, I was one of the officers in that organization.

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# They Can't See the Trees for the Forest?

## *A review of The Hidden Life of Trees*

*William L. Hoover, PhD*

I can't help myself, I see trees in a forest. I ask which ones are "keepers," i.e. crop trees, and which should go to reduce competition with them. Species, form, defects, apparent growth rate, but especially likelihood of making a saleable tree in the future factor in. That's how I was trained in the 1960's. Since then foresters have learned to think of forests more holistically. We leave standing deadwood to feed and shelter wildlife. We manage other vegetation to do likewise and control erosion. And, we struggle to control invasive species. But still, we focus on what we can see above ground in the context of a site classification. After all, exposure to sunlight determines what happens there. Below ground is considered primarily with regard to moisture availability and nutrient deficiencies on some sites. Is there more down there that foresters ignore at our peril?

Foresters' fundamental beliefs are challenged by the segment of society that sees forests, not individual trees. Harvesting trees to them is like the amputation of a body part. They view trees for their contribution to the forest as a whole. Some go further by anthropomorphizing trees. Peter Wohlleben, a German forester is one of "those people," reflected in The Hidden Life of Trees: What They Feel, How They Communicate: Discoveries from a Secret World, Greystone Books, Vancouver/Berkeley, 2015, 272 p. The book was featured on the 30 percent off display at my local independent bookstore, a place I love. If you're a Purdue grad you know it, Von's Shops in the Village. I like being challenged intellectually, and this title was a slap upside my head. Surely no forester believes that trees are like people, at least not in scientific terms, philosophically maybe. The author's hypotheses are based primarily on his observations in the beech-oak forest he manages in the Eifel Mountains of Germany. It also includes commercial coniferous plantations. He also draws on some peer-reviewed research, but his intended audience is a non-scientist.

Wohlleben's analogies to humans is rooted in his conclusion that trees communicate. He doesn't hear trees talking, although they may scream. He focuses on the release of chemicals by one picked up by another. Tordon flashback is an example. Root grafts transfer it from the treated tree to others. Gases transferred through the air are another mechanism. The roles of pheromones are well documented, including our own mating. He cites the example of acacia trees in Africa that produce toxic substances when giraffes are dining on them. They release ethylene that is sensed by nearby trees. They respond by also producing the toxic substances. Giraffes have adapted by moving to trees far enough away to not have received the signal.

He contends that trees support each other in other ways, essentially organisms. The book opens with a description of the living part of a dead tree. He found a moss covered section of a "dead" beech tree. He couldn't pick it up because it was attached to the ground. Looking further he identified the "gnarled remains of an enormous ancient tree stump" without any sprouts. Sections of it were alive under the moss. This was a result of surrounding live trees transferring nutrients to the remnants of the "dead" tree. This occurs by interconnecting fungal networks around root tips, or root grafts. He also discusses the fungal connections, an underground web of mycelium.

Trees are sex—that is, they come as male and female on the same tree or single-sex trees. All living organisms reproduce, but is the reproductive mechanism of trees analogous to humans? He compares coniferous and deciduous species. Conifers produce large quantities of seed every year consumed by animals to a limited extent. Deciduous trees produce large quantities every few years. Their large seeds are a primary food source for many animals. Lean years are a control on animal populations, which increases the likelihood of seedlings developing. He also discusses

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## Stumpage Report

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increased to 2.8 bids per sale up from 2.55 bids per sale last year but consistent with the number of 2.9 bids from 2.89 bids in 2015 and 2014.

The high number of bids on the higher quality sales reflects the strong market for the better quality timber. In theory more competition also results in a higher stumpage price.

### *Stumpage Prices (See Table 1, Figures 2 & 3)*

The average stumpage price for all the sales reported was $497/MBF, down slightly from $514/MBF in 2016, which is the third highest value reported and down only slightly from highest price of $522/MBF reported in 2015. The high quality sales appeared to have declined significantly with an average stumpage value of $682/MBF (median value of $713/MBF) down from the 2016 reported value of $814/MBF (median value of $744/MBF) which is an increase from the previous average high of $750/MBF in 2015 (median value of $733/MBF). Although there is a significant difference in the average value, the change in the median value is much less significant—2017 - $713/MBF; 2016 - $744/MBF; and 2015 - $ 733/MBF. Based on the distribution of the value of the sales, median is likely the best indicator. This year there were 19 sales that brought over $1.50 per board foot and 29 sales that brought over $1 per board foot. Most of these sales reported a very high component of black walnut.

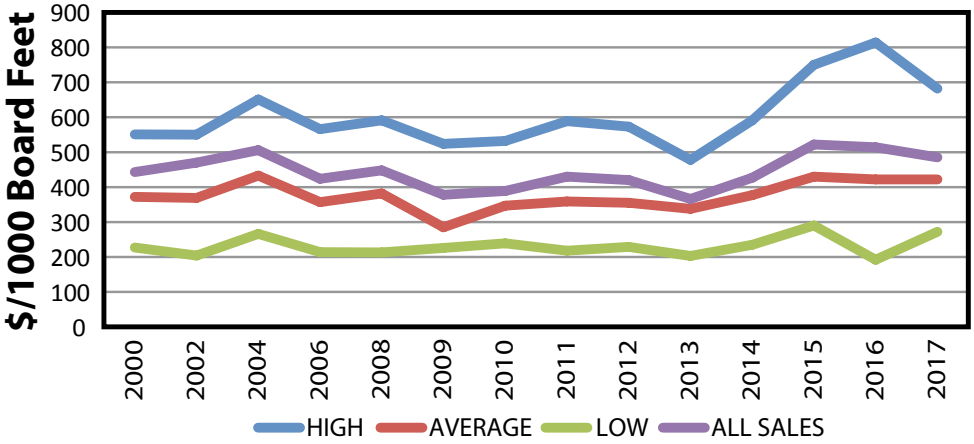
The average stumpage price for the medium quality sales is $422/MBF (median value of $424) which is the same as the 2016 average stumpage value of $430/MBF (median value $415/MBF). The highest average stumpage price for medium quality sales was $433/MBF reported in 2004.

The average stumpage value for the low quality category increased significantly to $272/MBF (median value of $286/MBF) which is much higher than the value of $192/MBF (median value $190/MBF) reported in 2016. This value, however, is similar to the record value of $290/MBF reported in 2015. The range for the stumpage prices has generally been between $200-$230/MBF since 2001. The low number of low quality sales reported last year along with a few larger very low quality sales likely had a significant impact on last year's value being so low.

This year 29 sales (9.4%) brought over $1.00 per board foot compared to 31 sales (9.2%) last year. The number of "very high value" sales has been consistent since 2015 (36 sales or 9.8%). However, the number is generally higher than prior to 2014. This increase is largely attributed to the high prices associated with black walnut and white oak. These very high value sales are generally outliers that may distort the average stumpage value for most woods, which is why the median value is likely the best indicator of value.

**Landowners should keep in mind that markets are only one factor to consider when selling timber**. The condition of the tree is one of the most important factors that determine when is the right time to sell a specific tree. Is the tree increasing in value or declining – is the trees condition (health and vigor) going to decline, stay the same, or improve? Trees should be sold based on their problems or lack of potential than their current value. Ideally, you should sell your good trees when they have reached their peak. Another factor to consider is what impact that tree will have on the health, vigor, and resiliency of the future stand. Is it competing with a better future crop tree or will it benefit or negatively impact natural regeneration? The lower quality sales are generally improvement harvests (i.e., commercial weeding) and the opportunity cost in lost productivity of the forest by not conducting these sales can be significant. If done properly the value per board foot should increase in subsequent sales along with the financial productivity and quality of the woods.

Figure 2. Average Stumpage Price Per Year

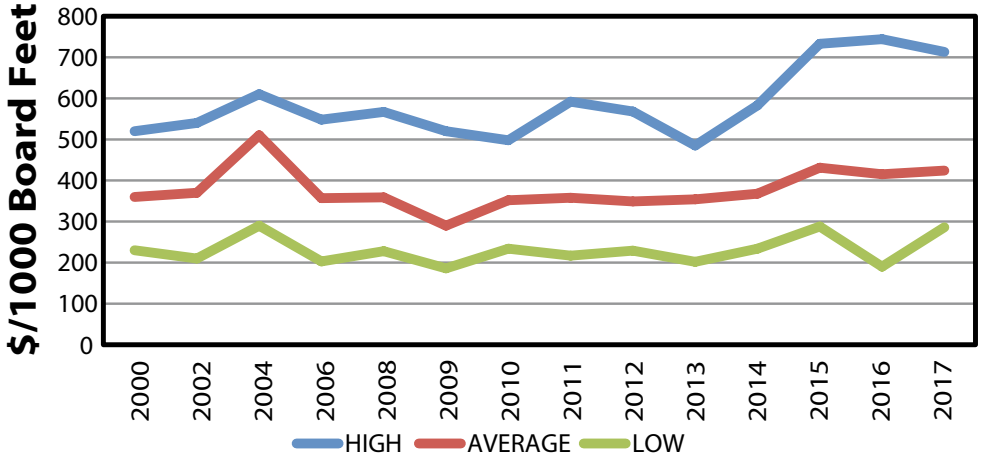



The stumpage prices for all sales, high quality sales, medium quality sales, and low quality sales held between April 16, 2016 and April 15, 2017 has a typical distribution (Figure 1). The data is distributed along a bell curve for low quality, medium quality, and all sales. The bell curve indicates the range in values that most sales fall. The jagged line at the higher end of the high quality sales is evidence of the variation in value special trees, and especially, the effects that high value walnut can have on the price.

All sales—low, medium, and high quality—can be affected by sales with

potential veneer or by the presence of a few high value trees, particularly black walnut and white oak. It is important for landowners reading this report to realize their timber typically will fall within the range of stumpage prices but probably will not fall into the outlying values. This makes it important to work with a professional who works for you when selling timber so that you know exactly what you have. An educated seller and an educated professional buyer working together generally results in a very successful sale.

Figure 3. Median Stumpage Price Per Year




The weighted average stumpage price by sale type (obtained from this survey in 2000, 2002, 2004, 2006, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, and 2017) is reported in Figure 2. The weighted average of the stumpage price is the total dollar value for each sales category. The median stumpage price per year for each sales category is reported in Figure 3. The median price is the amount where half of the sales are higher and half are lower. The price reported is per 1000 board feet ($/MBF) for standing timber.

## *Comments*

Standing timber prices often vary during the year and can change rapidly based on supply and demand. The prices are influenced by many factors including tree species, the tree quality and size, where you are in the state, the distance to a sawmill, the access and accessibility of the trees, the size of the harvest, the terms of the sale, etc. This report and the comments below are merely a snapshot in time. It is therefore important to work with a forester to get an up to the minute view of the existing markets.

- Black walnut continues to be hot. Demand for walnut and white oak remains strong.
- White oak markets continue to be very good due to the export markets (especially to China) and high demand for barrel staves. Routinely get inquiries from around the world for high quality walnut and white oak.
- Red oak prices are showing some improvement, especially for larger, higher quality trees.
- Cherry markets are finally beginning to come out of a long slump.
- Poplar demand remains good and steady, especially for larger trees.
- Sugar maple demand is getting stronger, especially for white wood.
- Ash trees or logs, if "alive (free of emerald ash borers) and larger" are bringing a good price. Most of the better logs are exported. Buyers remain leery of questionable ash. The ash market is strong but finding trees that cut white is a concern when buying standing trees.
- Hickory is still a niche market; interest seemed to moderate over the year and has resulted in lower prices.
- High quality timber is generally in high demand. A few good trees can attract buyers to sales that are generally low quality.
- Low grade timber dropped at the beginning of 2017 but is doing better now. Demand for ties, cants, and flooring grade lumber has been weaker in 2017.
- Larger sales draw more interest. Smaller sales will draw interest if enough quality present or access is good.
- Sales with low volumes are hard to sell unless some high quality timber is present or access is desirable.

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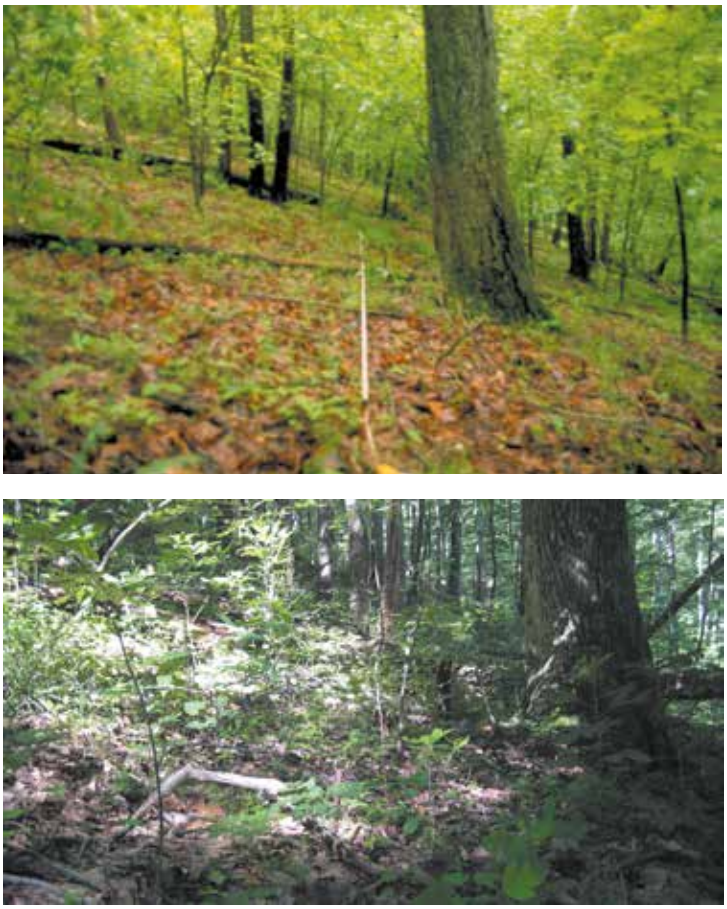
# Ecological Effects of White-tailed Deer in Hardwood Forests

*By Mike Jenkins*

Of all animal species, the white-tailed is perhaps the one most associated with the forests and fields of the Midwest. Given how commonplace deer are today, it is hard to believe that the species was once extirpated from the state of Indiana. However, unregulated hunting and the conversion of wildlands to agriculture resulted in their elimination from the state by 1893, when the last reported harvest of a wild deer occurred in Knox County. Between 1934 and 1942, deer from Wisconsin, Pennsylvania, and North Carolina were released in Indiana. With a lack of hunting and increased forest cover resulting from land abandonment during the Great Depression, the deer herd quickly rebounded. In 1951, the first hunt in 58 years occurred. Since then, annual hunting statistics provide an idea of how the population has rebounded. In 1975, nearly 9,000 deer were harvested, by 1985 the number grew to over 32,000, and by 2016 nearly 120,000 deer were harvested.

Deer are selective browsers, which means that they consume more-palatable species before moving on to eat less palatable ones. Sustained browsing by overabundant deer populations can lead to the local extirpation of these preferred species, allowing unpalatable plants to increase in numbers. This has the effect of reducing the diversity of plant species found in the understories of forests. For example, trillium species are heavily browsed by deer during the spring and summer. When deer are overabundant, trillium plants become shorter, flower less through time, and may eventually disappear from the forest. As such, they are often monitored as an early indicator of deer overabundance. In Indiana, reduced height of jack-in-the-pulpit is used as an indicator of excessive browsing by deer. While deer rarely eat this unpalatable species, its growth is stunted by the soil disturbance and compaction created by the movement of overabundant deer.

During the winter, deer browse woody seedlings, saplings, and shrubs. While deer consume a range of woody species, they will disproportionally browse certain species. Within Indiana forests, oak seedlings and saplings (and acorns) are preferentially eaten by deer. Other species, such as paw paw and slippery elm, are largely left unbrowsed. As with herbaceous vegetation, this selective browsing increases the abundance of these unpalatable species within forest understories. Through time, deer can influence forest canopies by only allowing unpalatable and browse tolerant species to successfully reproduce and grow into the canopy. Research has shown that white-tailed deer can short-



*A vegetation plot in 1996 (top) and 2010 (bottom) in Brown County State Park, Indiana. Differences in vegetation structure and plant species diversity is attributed to lowering deer densities through managed hunts.*

circuit forest management and restoration efforts by eating underplanted seedlings. Consequently, fencing and tree shelters are often used to protect planted seedlings.

Concurrent with the growth in deer populations, invasive plants have spread across eastern forests over the past decades. Not surprisingly, white-tailed deer and invasive plants often have interactive effects in forests. For example, Japanese stilt grass and garlic mustard, two widespread invasive herbaceous species, are both unpalatable to deer. Deer will preferentially browse native species while leaving garlic mustard and stilt grass untouched. Through time, the cover of these two undesirable species will greatly increase while the cover of native species will decline. On first inspection, one could assume that, based upon their dominance of the ground flora, these invasive plants are drivers of change in forests. However, in reality, garlic

mustard and stilt grass are passengers riding along on the coattails of white-tailed deer, the true driver of forest change.

To understand the effects of white-tailed deer, researchers build fenced in exclosures that deny deer access to selected areas within a forest. Through time, comparing the inside of exclosures to areas where deer have access allows researchers to isolate the effects of deer on the ecosystem. In Great Smoky Mountains National Park, an exclosure study found that, outside the fences, deer consumed seedlings and saplings and reinforced the dominance of stiltgrass. However, inside the fence woody vegetation grew up through the mat of stiltgrass and shaded out the grass, thereby greatly reducing its cover. However, another exotic plant, multiflora rose, increased in cover within the exclosures. Deer will consume this species after they have eaten more-preferred species, thereby keeping its growth in check. These differing responses highlight the complexity of interactions between deer and invasive plants.

When considering the negative effects of overabundant deer populations one question comes to mind: what can we do to stop or slow the effects? As mentioned previously, deer fencing and tree shelters can be used to protect planted seedlings at small scales. In addition, interplanting palatable species with unpalatable species may provide some protection, as may forgoing weed control to provide protective cover for planted seedlings. To protect forests at larger scales where fencing is impractical, hunting is typically used to reduce high deer population densities or maintain more-moderate densities. This leads to a second question: can hunting reduce or control populations enough to allow the recovery of forest vegetation? While tracking the effects of hunting on forests at a statewide scale is daunting, studies have shown that deer population reductions can have a positive effect. For example, resampling of long-term vegetation plots in Indiana state parks revealed that controlled deer hunts initiated in 1993 have allowed the recovery of forest plant communities. Following 17 years of hunting, this study found increased cover of forest perennial herbs, decreased cover of invasive plants, and increased plant species diversity across 15 state parks.

*Deer exclosure along Hyatt Lane, Cades Cove located in Great Smoky Mountain National Park, Tennessee (circa 2014). Note the lack of vegetation outside of the fencing were deer have free access.*

Although over abundant populations have negative effects on forests, it is important to remember that white-tailed deer are a natural part of our forests and their abundance is driven by human activities. At lower population densities, research has shown that deer have a positive effect on the diversity of forest plant species. For example, an exclosure study conducted as part of the Hardwood Ecosystem Experiment in southern Indiana found greater plant species diversity in harvest openings outside of exclosures where deer are able to browse. Browsing by deer reduced the density of large saplings and blackberry bushes that dominate forest openings, allowing increased light and growing space for a larger mix of species. These results highlight the importance of managing white-tailed deer herds within the context of the landscape in which they occur. While we all appreciate and value this iconic species, we must remember that it is only one component of a healthy forest ecosystem.

*Mike Jenkins is an Associate Professor of Forest Ecology in the Department of Forestry and Natural Resources at Purdue University. Before returning to Purdue, he worked for ten years as a vegetation ecologist for the National Park Service in Great Smoky Mountains National Park.*

# Ask the Steward

*By Dan Ernst*

**Question:** The loss of an old friend makes one ponder—Do trees die of old age?

**Answer:** That is not as simple question as appears on the surface. Certainly trees age, get old, unhealthy and eventually succumb (senesce) and recycle. But is it old age that does them in? I tend to say yes, but with the understanding that old age is largely a secondary cause. Most trees die at a very young age as they compete for space, light, nutrients and other natural elements to establish themselves and fill their growing space. You can only imagine the struggle as 10,000 forest seedlings fight for space that as mature trees only 20-40 trees may occupy. The survivors are young and vigorous and able to fight off threats and damaging agents through the process of compartmentalization—and maybe a bit of luck. However, with age and growth trees fill the space provided and their growing demands are not as easily met. This puts trees under stress, and like aging humans, old trees are less resilient and their systems less able to compartmentalize, fight off disease, insects, drought and other stressors. The challenge for tree owners and forest managers is attaining the unique 'long vision' important in managing forests and woodlands. For foresters, specialized education and training, along with years of experience help develop their ability to visualize individual trees AND the forest 10 years from now, 20 years from now and even 50 years down the road. They see the ongoing struggle for survival, the resilient capacities of the forest and the clues present indicating which aging trees are in trouble and which trees are coming on strong, and thereby, formulate informed forest decisions. So—like you and me—old age is certainly a factor, but in the end it is a complex process with multiple contributors rather than old age itself. An amazing journey of life.

**Question:** Is Indiana really growing timbers for the historic warship, the USS Constitution?

**Answer:** You bet. And all Hoosiers can be proud of the noble honor that Indiana and Indiana white oaks play in the restoration and preservation of this historic ship. The USS Constitution was built in 1797 and is berthed at Pier One of the former Charlestown Navy Yard in Boston. She is the world's oldest commissioned warship afloat.

During the War of 1812 engaging British sailors observed cannon balls bouncing off Constitution's hull and exclaimed her sides must have been made of iron. This earned Constitution the nickname "Old Ironsides". In reality, the nearly 24 inches of effective thickness of oak wood along the entire length of the hull could withstand the beating received.

Today, even after 220 years, around 12 percent of Constitution's wood is original. The ship's keel, bottom frames, and bottom 13 planks of the hull have never had to be replaced.

White oak trees at NSWS Crane in southern Indiana were first approved to be set aside in November 1973 after ship repairs found white oak of the size needed proved to be difficult to find and very expensive on the private market. Imagine sourcing defect free white oak hull planks, 30 to 40 feet long and six inches thick! Fortunately, we grow that kind of oak right here in Indiana.

Approximately 150 GPS-located mature white oaks have been set aside at Crane for future use for the Constitution, including 35 trees harvested in 2014. Today you can visit a section of the "Constitution Grove" among the 53,000 acre forests at Crane in Martin County.

The Constitution is berthed at Pier One of the former Charlestown Navy Yard, at one end of Boston's Freedom Trail and is open to the public year round. Proudly inside her is a piece of home grown Indiana hardwoods.

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*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.*

## Stumpage Report *Continued from page 7*

- The dwindling number of professional loggers continues to be a problem. Buyers continue to voice concerns about having enough logging crews or finding good help.
- Beginning to see companies update equipment in the last couple years in order to increase output.

### *General Management Comments*

Several of these comments have been made in years past but they are still very true today.

1.) **Manage your woodland - have a plan, know what you have**, and what you need to do, timber is valuable, and taxes are low; 2) grow quality; 3) if you want the best price and want to leave timber for the future, then hire a consulting forester; and 4) don't plow or blacktop the access road and expect to get your timber out of the log yard to the county road.

Plan early and thoroughly if considering a harvest to allow for control of invasive species, timing the markets, and better access. Contact the forester early to allow him to schedule the work and provide guidance.

**Access and terms are very important** when selling timber. Timber sales that had year round harvest access were in high demand and were of higher value to buyers. Limitations to access such as "no harvesting during deer hunting season" or "no access when crops are in the field" will reduce bidders and result in lower bids. Give access strong consideration. In most cases the higher income from the timber will be more than the income lost from the acre or so of crops

- To receive a premium price for your timber provide timber purchaser plenty of time (possibly 2-2½ years) to remove timber (especially with wet sites after a couple very wet years). A good map drawing showing wood location(s) of marked timber, access, fences, fields, roads, creeks, and possible yarding site(s) make the process go better with fewer complications.
- Tenant farmers must be engaged and they must be cooperative for the harvest to run smoothly. Too often they work the field after the crops are harvested making access difficult or impossible.
- Bad weather this past winter (wet with no hard freezes) kept buyers behind on harvests. I believe this attributed to weaker pressure on bidding.
- Persistent wet conditions for most of the last year have made for difficult logging conditions making it even more important to have everyone (landowner, forester, loggers, farmers) involved and willing to be flexible with the process. A return visit by the logging crew may be necessary when conditions improve to smooth trails and landings. It may be advantageous to improve or prepare old skid trails during the summer prior to logging when condition are good.

**Invasive plants** (bush honeysuckle, ailanthus) continue to spread. Too many stands are being cut without pre-harvest control (poor planning) and the stand is overrun within a year or two of the harvest, negatively impacting the long term health and productivity of the woods. Control invasive species prior to any harvesting. Cost share assistance may be available to control the invasive plants from your local Natural Resource Conservation Service office.

Invasive species control is much more difficult after a timber harvest and the disturbance of the logging quickly magnifies the problem. Control them first even if it means delaying the harvest for a couple years.

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*Consulting Foresters that have contributed to this report in alphabetically order include: Arbor Terra Consulting (Mike Warner), Crowe Forest Management LLC (Tom Crowe and Jacob Hougham), Christopher Egolf, Gandy Timber Management (Brian Gandy), Gregg Forestry Services (Mike Gregg), Habitat Solutions LLC (Dan McGuckin), Haney Forestry, LLC (Stu Haney), Multi-Resource Management, Inc. (Thom Kinney and Doug Brown), Meisberger Woodland Management (Dan Meisberger), Chris Neggars, Quality Forest Management, Inc (Justin Herbaugh), Ratts Forestry (Chuck Ratts), Abe Bear, Stambaugh Forestry (John Stambaugh), Turner Forestry, Inc. (Stewart Turner), and Wakeland Forestry Consultants, Inc. (Bruce Wakeland, Mike Denman, Andrew Suseland).*

# Timber Sale Process on the Hoosier National Forest

*By Andrea Crain*

Timber sale locations are determined by identifying where harvesting is needed as a tool to move the Forest toward the desired conditions described in the Hoosier National Forest (NF) Land and Resource Management Plan. Specialists such as wildlife biologists, soil scientists, and foresters meet as a team and look at large areas. Often these are watersheds or areas where the management objectives are similar.

Once an area is approved by Forest leadership, data collection begins. Understory and overstory tree data is taken using both variable and fixed radius plots. This data, along with project objectives and ecological site capabilities are used to develop the proposed harvest areas and the silvicultural system that could be used.

When a proposal is completed, the National Environmental Policy Act (NEPA) process officially begins and one or more alternative actions are developed to achieve the purpose of the project. These alternatives are vetted with Forest staff and the public and then further refined, including measures to mitigate any anticipated undesirable effects.

Specialists, including biologists, archeologists, recreation specialists and others, then each write reports discussing the effects the timber sale would have on their resource. Information from these reports is rolled up into the decision document. At this point, the deciding officer chooses one of the alternatives, which authorizes the timber to be prepared for harvest in those areas. At this time, detailed prescriptions are written and "on the ground" implementation begins.

A large proposal will have multiple years of timber sales associated with it. Foresters try to design units of a sale in close proximity. After unit boundaries are designated, recon plots of the sale are taken. The Forest Service does not guarantee volume. However, we have policy that dictates the sampling error standards for expected timber sale advertised values. For example, it is Forest Service policy that sales with estimated values above $120,000 must have a sampling error of +10%. The recon plots are used to design a statistically defensible, efficient cruise.

Sale prep personnel go through a certification training and field evaluation to ensure they meet standards for cruising fundamentals and continued satisfactory cruising performance. Trees in hardwood or pine thinnings are individually marked by the cruiser using a special paint used only for tree designation. This paint contains a tracer element as a timber theft deterrent. The cruise method in marked units is via 3P. In 3P, every tree is given a predicted volume estimate. A percentage of these trees are measured to calculate the measured to predicted volume ratio. This ratio is used to calculate the sale volume. Volume estimation in pine clearcuts is accomplished by fixed or variable radius plots.

*Figure 1. A hardwood group select area harvested in early 2016.*

One of the biggest differences in Forest Service contracts is the unit of volume measurement. Nationally, Forest Service tree measurement sales are sold by cubic foot volume. Our standard unit of measurement is 100 cubic feet, or 1 CCF. The Hoosier NF uses a conversion factor for sawtimber volumes of 1 CCF = 600 board feet on the International 1/4 inch rule. At this conversion rate, an advertised sale of 2,000 CCF would be 1.2 MMBF, International 1/4. Current sales under contract vary from 164 to 5,688 CCF.

Once volume estimation is complete, the timber is appraised, taking into consideration required contractual costs such as roadwork on Forest Service roads, required equipment cleaning of off-road equipment for invasive species, as well as logging and hauling costs.

The contract is drafted with the specific sale information, such as location, volumes and contract term. Additionally, specific provisions for contractual areas like resource protection, payments, road maintenance and fire precautions are included.

Bid packages are sent to individuals and companies that have expressed an interest in receiving notice of Forest Service timber sales. Notices are posted in the local newspaper and on the Hoosier NF webpage. Sales are open for bid for a minimum of 30 days. The advertised value is the minimum price at which the timber will be sold.

Sealed bids may be turned in at any time prior to the bid opening. At bid opening the bidder with the highest bid is determined to be the apparent high bidder. The timber sale Contracting Officer must make an affirmative determination of the high bidder's responsibility, which includes having the financial and physical means to harvest timber, having a satisfactory performance record on previous timber sale contracts, and a satisfactory record of business ethics. Once this review is complete, the contract is awarded.

*Figure 2. A pine clearcut being harvested, June 2017.*

For standard timber sales, the high-bidder process previously described is used. The awarding of stewardship contracts is different. Stewardship contracts contain timber removal as well as land management activities. Potential bidders bid on rates for timber, as well as their rates for land management activities. Accomplishment of land management work in the contract builds credit for the timber purchaser that can be used to pay for timber removal. In these bid packages, potential bidders turn in a technical proposal. The bidder determined by an evaluation panel to be the best value to the government is awarded the contract.

After contract award, the timber purchaser must make a downpayment of 10% of the advertised value, plus 20% of the bid premium. A performance bond of 10% of the sale value is required. The downpayment is frozen until 25% of the sale value is cut, at which point it is released back to the purchaser. Rather than pay the entire value of a multi-unit sale up front, the timber purchaser only pays for the individual units in the sale as they harvest them. Additionally, the purchaser maintains extra money on account for additional volume for skid trails, landings, etc. Payments can be in the form of cash, or guarantees such as letters of credit or bonds.

During the life of the sale, the Forest Service makes frequent inspections to check for contract compliance and routine sale administration tasks such as agreements on the location of skid trails. Additionally they work with resource specialists such as biologists or recreation specialists for resource protection needs.

Direction for the federal timber sale process comes from laws passed by Congress, local and national Forest Service policy, and the NEPA document. The timber sale is a tool that allows us to meet restoration goals on the Forest, while supporting local jobs and economies with sustainably harvested forest products.

*Andrea Crain has been a public affairs officer for the Hoosier National Forest since 2016. She is responsible for outreach and information services, media contacts, legislative issues, and conservation education.*

# Coyotes Around the Home – Should You Be Concerned?

*By Brian MacGowan*

I give many presentations each year to landowners and homeowners. One animal that I get a lot more questions about in recent years is the coyote. Coyotes are actually native to Indiana, although their historical distribution is much smaller in the state than it is today. Their range expansion is simply the result of their adaptability. Things we have done to the broader landscape combined with less competing animals has opened up new resources to coyotes. You may tend to think that urban landscapes offer little for wildlife species and don't offer the quality of rural or more "natural" areas. Perhaps surprising to many, urban environments can often support larger densities of wildlife presumably because of increased food resources and lower trapping or hunting pressure. For coyotes, studies have shown that urban coyotes tend to focus activities in natural habitats within the urban landscape. They will still use more well-developed areas and the extent of which varies among animals; however, coyotes will often shift their behavior to avoid human activity.

Coyotes are considered to be a nuisance or even a safety threat by some. They are probably one of the few animals that homeowners want removed simply by seeing them in their yard. However, these fears are rarely justified. Diet studies of urban coyotes indicate they eat primarily rodents and rabbits. Coyote predation may actually help reduce conflicts with other species of wildlife. As a primary predator of Canada goose nests they may limit population growth in urban environments. Similarly, coyotes may do the same for white-tailed deer populations through fawn predation.

Fear of coyotes is derived largely of perceived threats to pets or people. Coyotes have been documented to attack people, but only rarely. Habituation to humans seems to play a role but it is also unclear how other factors contribute to these attacks. For example, the age or social status of the offending coyote and the intentional feeding by humans preceding the attack may play roles. Moreover, not all attacks are the same. Coyotes may attack out of defense, because of disease (e.g., rabies), or other reasons.

The threat to pets, particularly cats or small dogs, is much more real. Coyotes are known predators of cats. In urban areas, predation of cats is slightly higher than in rural areas, although cats still make up only about one percent or less of their diet according to studies. Cat predation may be ecologically beneficial given the impact free ranging cats have on our native wildlife. Attacks on dogs are less common but do occur and are most frequent during the coyote breeding season, December through February. Small dogs are at most risk but larger breeds may be attacked by a pair or family group.

While these facts on coyote behavior may alarm some, the truth is these are all extremely rare cases. Coyotes are around many of us every day and we aren't even aware of their presence. Coyotes are native to Indiana and can help control populations of other wildlife species that cause more widespread conflicts and property damage. However, there are a few common-sense steps we can do to avoid conflicts with urban coyotes. The most important is to never intentionally feed coyotes or other animals. They don't need it. Intentional feeding can contribute to coyote's habitation to people, which is believed to be a contributing factor to attacks. Some also recommend scaring off coyotes you see in the yard by banging pots and pans or similar actions. However, this may cause a defensive response in some animals and it not advisable.

*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.*

## Can't See the Trees *Continued from page 5*

inbreeding controlled by male and female flowers on the same tree opening at different times.

The next chapter deals with the tree lottery, how trees balance growth and reproduction. Both require large quantities of carbohydrates from photosynthesis, and in temperate climates, enough energy must be stored over the winter to restart growth and flowering. He also discusses the relationship between rate of growth and exposure to light. Little light means little energy, little growth and no seed output. Tree etiquette has to do with the form trees take is dependent on the species and growing conditions.

The author refers to real-time adaptations to rapid micro-environment changes as "tree school,"—that is, trees learn and call on learned knowledge when needed. His examples include adaptation to soil moisture. For example, species that evolved for moist sites can grow elsewhere by reducing water intake. Other species, such as spruce, do not adjust. He also discusses how trees physically support each other, reflected by the shape of their crowns. If an opening occurs the "pain" from bending in the wind causes an adjustment in where new wood is laid down, especially thickening of the truck instead of the previous growth rate in height. Drought causes some species to "scream" at an ultrasonic level, recorded by the Swiss Federal Institute of Forest, Snow and Landscape Research. The sound is generated by vibrations when the flow of water in the trunk is interrupted. He also cites a study of a sensitive plant that can be studied in detail in the lab. Mimosas, a tropical creeping herb, learns how to respond appropriately to precipitation levels. When they first experience steady drops of water they close their leaves, but then do not after "learning" that the drops of water will not hurt them. He never provides an explanation of how trees store the learned responses cited.

The other chapters are an overview of tree physiology in laymen's terms. He discusses water flow within the tree, bark thickness related to susceptibility to fire damage, reduced growth rate of suppressed trees in uneven-aged stands and the ability to respond when exposed to more sunlight, gaseous exchanges in leaves, filtering of particulate matter in air, carbon capture, and changes in species' ranges which he refers to as movement.

I highly recommend this book for those who don't understand foresters' fascination with trees and forests. After they read it we can discuss with them the relevancy of the analogies the author makes to humans. It can help us understand the perspective of those against any harvesting. From a forest science perspective, I came to the conclusion that forestry research has not provided the findings needed to relate the impact from stand manipulations to the complex web of life underground. Soil science needs to go beyond structure, nutrients, and moisture. Increased understanding of the "biology of soil" is needed.

*Bill Hoover is a professor Emeritus of Forestry, Purdue Univesity. During his tenure, Bill was a leader and nationally known expert in the application of the federal income and estate tax laws to family forest owners. He expertly guided thousands of landowners all over the U.S. through his publications, web sites, regular tax columns and workshop presentations on forest economics. One of the department's most popular publications was the "Indiana Forest Products Price Report and Trend Analysis" which Bill published from 1976 through 2013, spanning his 37-year extension appointment with Purdue University.*

## Regeneration Openings *Continued from page 4*

But I got to say, the results are remarkable. They're doing very well. Like I said, they were thinned in 2011. Now in 2017, we're driving up on a time where in the next few years they're going to need to be thinned again.

### *If you had to do it again would you do anything differently?*

No, I don't think so. No. No, I haven't had a major timber sale. I had a small timber sale in 2000. That was conducted by John Stambaugh and several years ago, he and I did a cruise over the whole property to get his recommendation regarding the next timber sale. Now we're three, four, five years away from the next timber sale.

### *Any thoughts about doing future regeneration openings going forward?*

No, I don't. At my age and getting on to my limited ability to do much of that work anymore, no, I haven't had any thoughts about additional ones.

### *Is there anything that's surprised you the most as you've observed the openings over the years?*

I'm surprised at the rate at which they regenerated. Not only the rate at which they grew, but with all of the different species that grew, and the quantity that grew. Prior to the first thinning, it was thick. It was very thick. Opening up the area to sunlight proved a real benefit to promoting new growth and continued growth.

*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. John Stambaugh is a consulting forester. He represents INSAF on the Woodland Steward Institute board.*

# Days Gone By . . .

*A group of three timber buyers for different sawmills making an estimate of standing timber for a group of woodlot owners in Whitley County, Indiana (photo by Roy C. Brundage, undated).*




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