

Woodland Stewardship Management Plan

Owner's Information:

Owner: MCCLAIN MICHAEL DALE ET AL

Signed: 

Date: 02-19-2026

Case Number:

RECEIVED

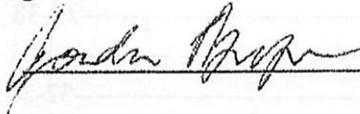
FEB 25 2026

Jill Davidson
Athens County Auditor

Preparer's Information:

Prepared by: Jordan Beyer – Consulting Forester

Signature:



Focus Forestry LLC
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Date: February 19, 2026

Email: jordan@focusforestry.com

This plan is fully effective for the period beginning February 19, 2026, ending February 19, 2036

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Woodland Stewardship Management Plan

Owner MCCLAIN MICHAEL DALE ET AL
Address 13876 US Route 33
Nelsonville, Ohio 45764
Phone _____ Case Number _____
Cell 740-591-1217 Email Address: Tessa McClain <willist9380@hocking.edu>
County Athens Township: Dover & York Section: 32 & 2
Parcel(s): 2 Parcel Number: G010010057300, P010010075200
Location: Same as address

Woodland Stewardship Acreage: 138.2 Non-woodland Stewardship Acreage*: 0
Total Property Acres 223.433 * Non-woodland acres for which stewardship recommendations are made.

This plan was written to qualify the landowner's woodland for the programs checked below:

- Ohio Forest Tax Law Current Use Agriculture Value (CAUV)
 Environmental Quality Incentives Program (EQIP) Other:

Property coordinates

Latitude: 39.40468 Longitude: -82.16480

Landowner Objectives and Goals

1. Develop a Timber Harvest Plan
2. Support Wildlife / Deer
3. Improve/Maintain Recreation
4. Maintain Property for Future Generations

General Woodland Description

The McClain property is in Athens County and is split by US Route 33. It is a multi-use property that focuses on timber production and recreation. The property has a long history of timber harvesting, and most recently had a heavy harvest over much of the property. Some of the steeper slopes and bottoms were the only areas excluded.

This harvest, which took place about 5 years ago, was likely an 8 to 10 inch diameter limit harvest. There is a mosaic pattern of heavier cut and lighter cut areas. Most of the remaining trees are shade-tolerant pole-size stems. In locations where few residual trees remain, the cut resembles a clearcut, and quality hardwood regeneration is occurring and developing nicely.

Few invasive species are present. Most are located near the edges and along forest roads/trails. The scattered tree of heaven can be found in small groups. All other shrub invasives are sparse. Stiltgrass was found growing along forest roads and trails.

Stand 2 and 3 are other locations on the property that were not recently harvested. These stands have mixed stocking, quality, and size. Stand 2 is a nice upland oak type stand with white oak as the dominant species.

There are other locations, especially south of US highway 33, that have trees but would not be classified as timber-producing forestland. It would still be beneficial to treat invasive species in those other areas but are not specifically outlined in this plan.

Whole Property Management:

1. Start by marking and monitoring the boundaries. Ensure markers are visible and not fading. Many boundaries were marked, especially along state forest lines. Some touchups may be needed.
2. Continue to maintain trails and access to the property.
3. Work to keep your property clean. This includes removing trash and other materials that do not belong. Do not dump any chemicals or trash on your property.
4. Improve the health of the woods by continuing to monitor for newly established invasive species. Treat these with appropriate methods to reduce their spread. This includes the treatment of invasive species on parts of your property that are not forested.
5. Practice BMPs(Best Management Practices) by preventing water runoff and soil erosion. The Ohio BMP manual is located in the factsheet section of this plan.
6. When the time comes, do not high grade your woods! Sell timber with the help of a professional forester who has your best interests in mind.
7. Continue to access and monitor your forestland and note any changes that you see. Any immediate signs of decline should be cause to reach out to your forester.

Land Area Estimates-

Forestland – 138.2

Other (homesite, field, open water, row, etc.) – 85.233

*Areas are estimates.

Intellectual Property and Usage Rights -

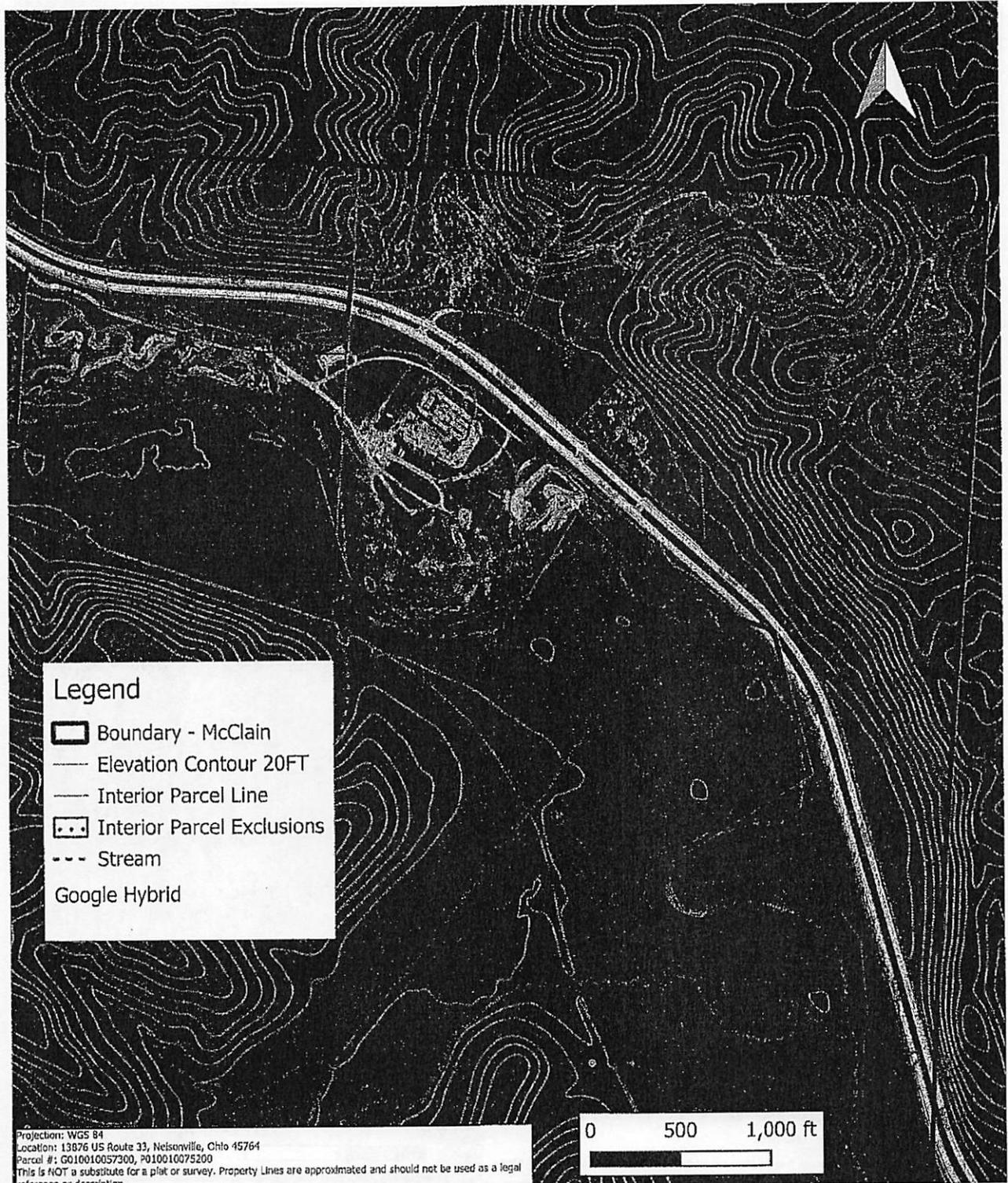
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Landowner: MCCLAIN MICHAEL DALE
ET AL
County/ Twp/ Sec
Athens/ Dover & York/ 32 & 2
Estimated Forested Acres: 138.2
Surveyed Acres: 223.443

The McClain Property

Prepared By: Focus Forestry LLC
Jordan Beyer - Consulting Forester
February 18 2025

Topography & Aerial Map

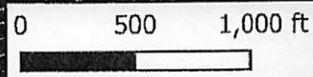


Legend

-  Boundary - McClain
-  Elevation Contour 20FT
-  Interior Parcel Line
-  Interior Parcel Exclusions
-  Stream

Google Hybrid

Projection: WGS 84
Location: 13876 US Route 33, Nelsonville, Ohio 45764
Parcel #: G010010057300, P010010075200
This is NOT a substitute for a plat or survey. Property Lines are approximated and should not be used as a legal reference or description.

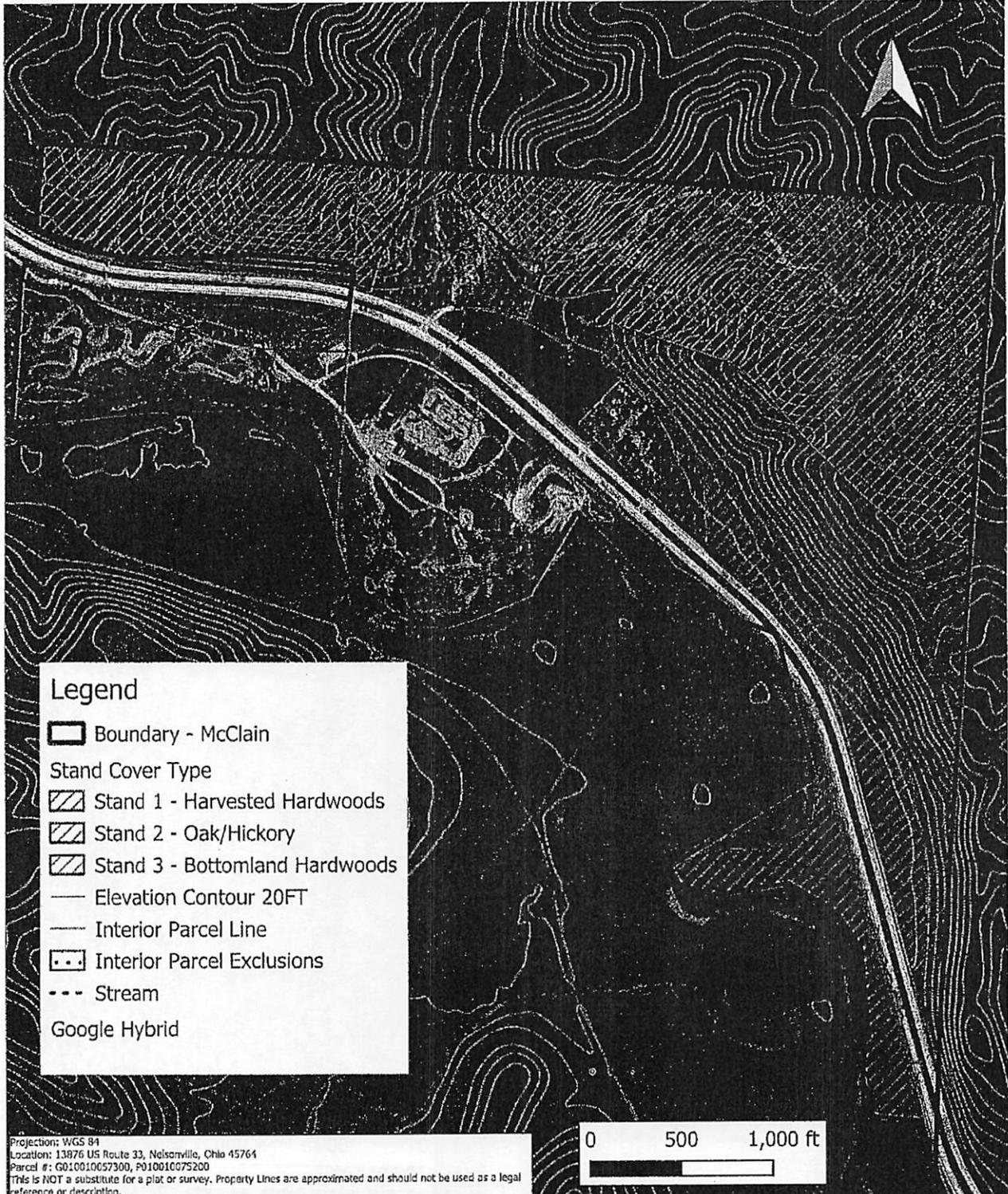


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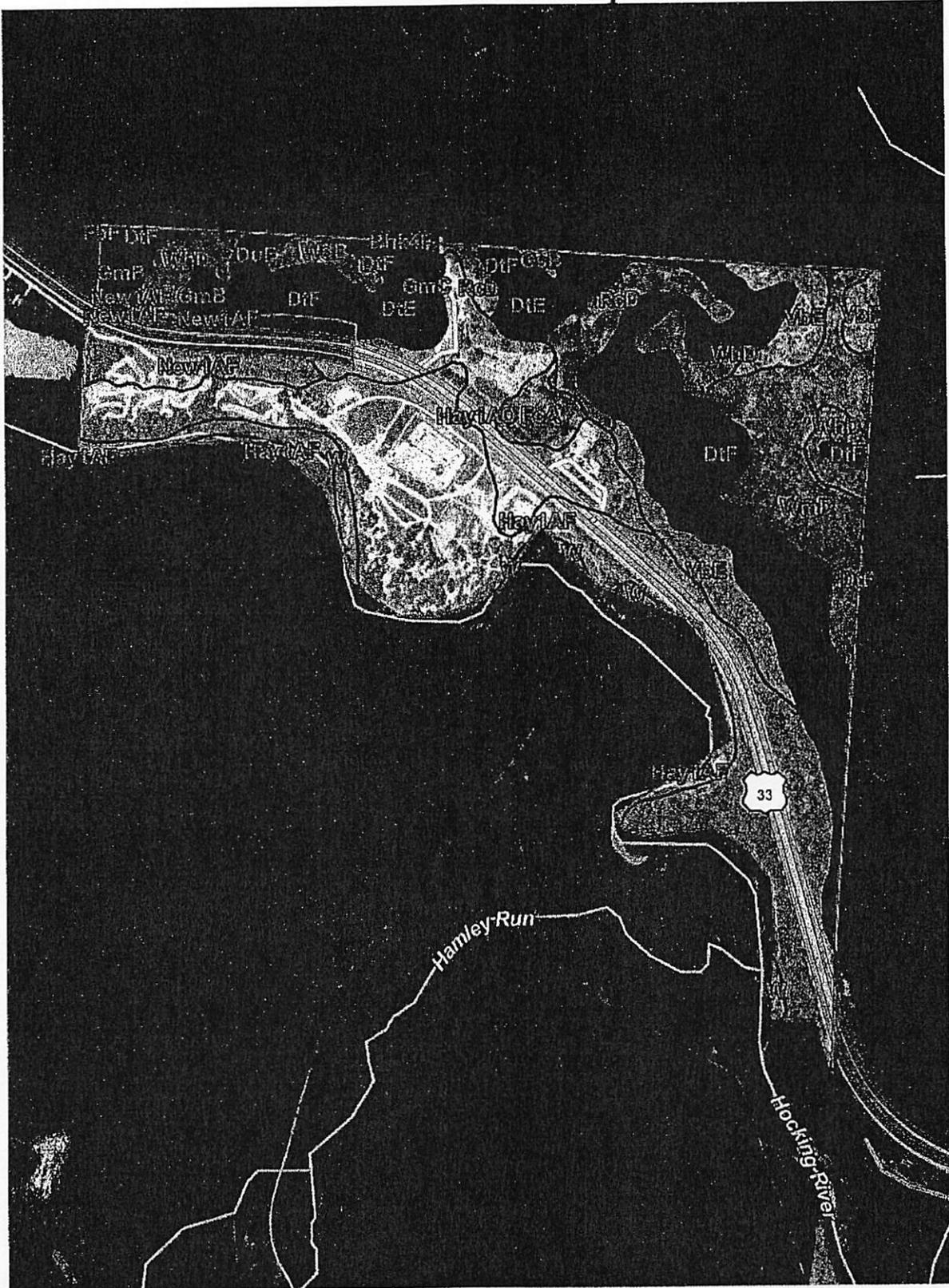
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Stand Cover Map



Woodland Soils Map



The soil map is above, with an overlay of N. Red Oak Site Index. See the appendix for the key.

Woodland Stand Description and Management Recommendations

Stand 1 – Harvested Hardwoods – 83.2 acres

Stand Species: White Oak, Black Oak, Sugar Maple, Yellow Poplar, Shagbark Hickory, American Beech, Red Maple, Honeylocust, N. Red Oak, Sassafras, Bigtooth Aspen, American Sycamore, Yellow Buckeye, Pignut Hickory, Eastern Wahoo, Sourwood, Chestnut Oak, Scarlet oak, Sumac spp., Ash spp., Dogwood, Redbud, Greenbriar, Grapevine,

Forest Type: Mixed Appalachian Hardwoods

Size Class: Seedlings to saplings with pole overstory. Some larger trees are scattered.

Stocking Level: Fully Stocked with Basal Area of: N/A (ft²/acre)

Stand History: Stand has been harvested various times in its development, likely logger selection type harvest. More recently, about 5 years prior, this stand was harvested by cutting most trees greater than 8- 10 inches DBH.

Topography: Mixed topography but stand is generally west to south facing slopes. Slopes are moderately steep.

Invasive plants or insects impacting this stand: Tree of Heaven, Autumn Olive, Privet, Oriental Bittersweet, Japanese Stiltgrass.

Management Recommendations and Considerations: This stand makes up the large majority of the forestland for this property. Prior to the most recent harvest, there were likely more variety and diversity across different parts of the stand. These differences are still present, but much harder to see. The cutting has more or less reset this entire area and management for it should be the same.

One issue with this cutting is, believe it or not, it was not cut heavy enough. This harvest should had been a true clearcut by cutting all stems, including the pole sized trees that still remain. The issue arises because these pole sized trees are generally older, if not close to the age of the larger mature trees that were harvested. These trees are stunted in growth and generally less desirable species, like maple and beech. So this means that where more pole size trees remain, sunlight is limited to the forest floor, and the understory trees cannot properly grow. We could see black and white examples of this during the site visit, with areas that were cut more heavily (more like a clearcut), and the new seedlings and saplings were growing great, and the species composition was good. Underneath the pockets of pole sized trees, that was not the case.

So what does this really mean and what should be done? In a perfect and ideal world, assuming the trees were not cut at the time of harvest, you could have a pulpwood operation come in and harvest these pole sized trees for pulp. Based on the current market and the amount of pulp in this stand, that is not practical. The next best scenario would be to cut the pockets of pole sized trees. They often do this practice on federal forestland after a commercial operation and it more or less takes a harvest and turns it into a true clear-cut. This again is not going to be very practical as the stand is thickening up to the point where access will become difficult and just the amount of effort involved. Although it is an option.

What I will recommend is that if you need to cut firewood or have any other personal wood issues but cutting these pole sized trees. Feel free to remove that at your discretion and

when needed. There is a considerable amount of firwood on the ground from other trees/ prior harvesting. Use what is accessible to you.

Now, the more important thing to consider will be invasive species control. There are really not a whole lot of invasive species in this stand. Most are located along the forest roads or are in groups scattered around. I noticed tree of heaven and the autumn Olive as the 2 biggest ones. Treat these invasive species as access allows. I would recommend treating most invasives with either a cut stump or basal bark treatment method. All invasive shrubs and trees can be treated with a basal bark treatment. All shrub and most tree species can be treated with a cut stump treatment with the exception being tree of heaven. Tree of heaven cannot be cut stump. It should instead be treated with a basal bark treatment method.

Because of that, I recommend using a basal bark mixture. If you do decide to cut stump of the other species, the basal bark mixture can still be used. A basal bark mixture can be made by mixing a herbicide in diesel fuel. This mixture should be between 20 and 30%. A herbicide such as Triclopyr 4 or Relegate works well. The diesel/herbicide mixture is applied to the lower 18-24 inches of the trunk. The herbicide is absorbed and the plant should die within a few weeks or months.

Stiltgrass was found on the property. Stiltgrass is a herbaceous weed. It can grow quickly, developing into thick patches that can choke out seedlings. Currently, there are a few separate treatment methods for stiltgrass. More information can be found later in this plan.

<i>Management Recommendations for Stand</i>

Invasive Species Control

Grapevine Control (if found. Few can remain to support wildlife)
--

Remove Midstory/ Residual Trees as needed.
--

Woodland Stand Description and Management Recommendations

Stand 2 – Oak/Hickory – 35.4 acres

Stand Species: Chestnut Oak, White Oak, Northern Red Oak, Black Oak, Bitternut Hickory, Shagbark Hickory, Sugar Maple, Sourwood, Dogwood, Blackhaw, Mapleleaf Viburnum,

Forest Type: Oak - Hickory

Size Class: 14-18 inches DBH average. Some larger 20-22 DBH trees. Trees tend to become larger further downslope.

Stocking Level: Fully Stocked with Basal Area of: 110 (ft²/acre)

Stand History: Stumps were founding indicating a previous harvest. Likely a loggers selection and larger diameter limit harvest.

Topography: Southwest facing slope with small draws leading to the bottom. Very steep at 45+ % Slope

Invasive plants or insects impacting this stand: Very few invasive found. Invasives found near forest stand edges and along forest roads(Autumn Olive).

Management Recommendations and Considerations: This stand is located along a steep slope facing highway 33. This stand was not harvested during the last cutting and looks to have been harvested only lightly in the past. Most likely because of the steeper slopes, which would be difficult for the equipment to travel. There is one skid road that was cut about in the middle of the stand, so access is possible.

Invasive species are light in this stand. Very few had been found. I expect there are some scattered, but none in a great concentration. Invasive plants in this stand should be treated in the same way as others on the property. This stand should be heavily scanned and treated for invasives if a timber sale is planned.

I feel this stand could be a good location for a future timber sale, assuming markets are correct and access is good. However, I would recommend having it harvested with an improvement-type harvest. This type of harvest would remove the diseased, damaged, overmature, and undesirable tree species. This could be expanded by cutting some groups of trees to get sunlight to the forest floor and promote regeneration. I don't feel this cut needs to occur soon, but possibly in 5 to 10 years. An earlier harvest should occur if a great decline in the health of the stand occurs, which I do not foresee happening.

<i>Management Recommendations</i>
Invasive Species Control
Grapevine Control
Tree Planting of desired species.

Woodland Stand Description and Management Recommendations

Stand 3 – Bottomland Hardwoods – 19.6 acres

Stand Species: Black Walnut, American Sycamore, Honeylocust, Boxelder Maple, American Elm, Hackberry, Redbud, Persimmon, Grapevine.

Forest Type: Bottomland Mixed Hardwoods

Size Class: Pole to small sawtimber

Stocking Level: Fully Stocked with Basal Area of: 80 - 90 (ft²/acre)

Stand History: No known history or management.

Topography: Bottomland, gently sloped

Invasive plants or insects impacting this stand: Tree of Heaven, Japanese Barberry, Autumn Olive.

Management Recommendations and Considerations: Stand 3 is a small but vastly different stand from the rest of the property. It joins the Hocking River and a previous site of the Hocking Canal. The soils are odd, in the there are clearly areas with well drained soils and quality trees, and other areas where water lays and tree growth suffers. There are numerous quality black walnut trees along this bottom, most of pole or small sawtimber in size. I could see small improvements and timber stand improvement (TSI) to improve the growing conditions for these.

Start management in this stand by treating invasive species. This is a wet site and invasive plants often flourish. Treat these invasive species with appropriate methods. If water is lying on the ground, it is recommended to use a cut stump method or wait until the dry season to apply.

Remove grapevines by cutting them out of quality crop trees or wildlife trees. These could include any oak, black walnut, well-formed maples, and wildlife trees like persimmon. Any poorly formed or undesirable tree does not need the grapevines cut as these will still benefit wildlife.

One issue with this stand is that there is poor access. North of 33, a small path is there, but no larger equipment can pass. The part of the stand on the south side of 33 has very poor access. This will make management difficult. Work to improve access to both of these spots, if possible.

Some further management options for this stand would be a light TSI operation focus on the high-quality timber species such as the black walnut growing in this stand. Start by identifying high-quality trees, either trees with future timber value or wildlife value. Remove surrounding trees of lower quality to favor the crop tree. This will improve growth and vigor of the tree and shorten the rotation age until the next harvest.

<i>Management Recommendations</i>
Monitor for Invasive Species
Grapevine Control
Release Quality Crop Trees

Management Activity Schedule

Year(s) Suggested	Mgmt. Unit	Task Complete?	Acres	Recommendations
2026. Inspect the condition of paint every 5 years	Boundary	<input type="checkbox"/>	Whole Property	Indicate Forest Property Boundaries by painting a 4x4 inch blaze on boundary trees no greater than 100 ft apart. Use Nelson Boundary Paint for best results. Signs or post may be substituted instead of painted blazes
2026- 2036	All	<input type="checkbox"/>	Whole Property	Maintain and Improve Access/Clear Trails
2026-2036	1	<input type="checkbox"/>	83.2	Invasive Species Control/ Grapevine Control
2026-2036	1	<input type="checkbox"/>	83.2	Remove pole size overstory trees as needed for firewood, Etc. Remove culls as well.
2031	All	<input type="checkbox"/>	≈ 138.2	Optional Site Visit to Review Conditions, Progress, and Additional Recommendations.
2031-2036	2/3	<input type="checkbox"/>	55	Begin Invasive Control and grapevine removal.
2026-2036	2	<input type="checkbox"/>	2	Grapevine Control & Removal of Diseased and broken trees as needed.
2036	All	<input type="checkbox"/>	≈ 138.2	Forest Stewardship Plan Update
2036-2041	3	<input type="checkbox"/>	19.6	Begin TSI targeting quality crop trees
2033-2038	2	<input type="checkbox"/>	35.4	Review conditions for possible timber sale

This is a recommended activity schedule over the next 10 years. Activities can be completed sooner if prior management recommendations have been completed. I highly recommend, if possible, completing activities sooner than described here.

EQIP is an NRCS conservation program that aids producers. It can provide financial assistance to meet your conservation goals. Understand everything that is required before applying. It is best to speak with me before you apply for practice construction. Contact your local NRCS office for more information.

Stewardship Management Activities and Challenges Invasive Species Control and Timber Stand Improvement

Invasive Species Control

Invasive species are becoming a growing threat to Ohio's forestlands. Specifically discussed here will be the woody invasives along with stilt grass. These invasives can be in the understory or overstory. They will initially become established and spread by wildlife, wind, or neighboring properties. Following a disturbance, they will take off and outcompete native species. They can prevent regeneration, lower stand stocking, outcompete sawtimber trees, and change the overall dynamic of your woods.

When?

Begin invasive species control now/ when the season permits it. Your goal is to have the majority of invasive species under control over the 10-year plan. Complete more if possible or if you plan to start other TSI activities early. The best time of year to treat invasives is late fall. This is ideal for a few reasons. One is that the leaves of the natives will turn and fall off while invasives will hold on to their leaves for much longer and often stay green. This is not always true, but a good rule to go by. They then stick out and are easily and quickly identified. During this time of year, these plants send nutrients down to the roots. This allows for a more successful kill, sending all the herbicide to the roots. This is limited to basal bark, cut stump, and hack-n-squirt treatments for that time of year. Generally, the time of year will indicate what treatment method can be used. Foliar treatments can be done any time after full leaf-out in the spring and before the leaves change color. The most successful time to treat with foliar spraying is late May to September. Cut stump treatments can be started as early as late May, but are most effective from July to December. Basal Bark can be used anytime snow or water is not pooled on the ground. Spring treatments can be ineffective. The best time to use basal bark is from May to January. Hack-n-Squirt treatments follow the same timing as cut stump and are best applied from July to December. See "Treatment Schedule Table" located in the appendix.

Stewardship Goals This Accomplishes

- Improvement to future timber harvest stand.
- Improve species composition, browse, and bedding for wildlife.
- Improve diversity by creating space for native species.

Equipment For Invasive Species Control:

Using the right tools for invasive species control can make the task more manageable, comfortable, and successful if this is something you wish to complete yourself.

Familiarize yourself with these different treatment methods if you are not already familiar with them. More information can be found in the treatment method factsheet hyperlinked at the end of the plan. Hand pulling can be used as a viable treatment method on small stems. The roots are very brittle on most of the invasive species. Without the entire root pulled, the remainder will root suckering. Pulling is not an effective control method for the majority of woody invasives.

-Sprayers

What you will need will depend on what method of treatment is used.

Hack-n-Squirt

For hack-n-squirt treatments, a small sprayer which typically holds 32 to 64 oz, works well. This could be an inexpensive "Zep" chemical spray bottle or a more expensive handheld pump pressure sprayer. The zep bottles (and similar) generally have poor stream control, but their light weight and inexpensiveness make them a popular option. A hand sprayer made by Smith may be worth investing in if doing large amounts of hack-n-squirt. The model is T100V. It's a 48 oz sprayer which has a top handle pump. Typically, one pump is plenty of pressure for H-N-S. These sprayers can be found online.

Cut Stump

If cut stump treatments are necessary, a 1.5-2 gallon handheld sprayer or a 4 gallon backpack sprayer can be used. This treatment can be done using a water base herbicide or an oil base herbicide mixed with diesel fuel/ basal oil. A backpack sprayer will have a larger capacity and more comfort, but overall will be heavier, bulkier, and have a higher initial cost. The 1.5 to 2 gallon pump sprayers are cheaper and withstand chemical breakdown better. If you are spraying with an oil-based herbicide with diesel fuel or basal oil, plan to get a dedicated sprayer. The oils swell the plastics in the sprayer and lead to premature wear, rough pumping, and deformation. If a limited number of oil-based herbicides are used, the better option may be a 1.5-2 gallon hand sprayer as these can handle the breakdown from basal oils/fuels better. A great option is a sprayer made by Smith. It's a 2 gallon hand pump sprayer which can be purchased online or from Lowes under the Husqvarna brand. Pair that with a comfortable shoulder strap.

Foliar Treatments

For any foliar treatment application, a backpack sprayer is the way to go when working in the woods. They offer great control of stream, pattern, and pressure.

I recommend a backpack sprayer made by D.B. Smith. It's a hand pump sprayer with an internal piston pump. These are less likely to fail and cause a leak compared to other sprayer types which use external diaphragms. They can also be found relatively cheap online through Amazon and gardening supply shops. D. B Smith makes two models, the Field King Max and the Field King Professional. Both have the same functionality, one just includes a metal wand and better padding. If shopping online is not an option, I have seen these for sale at Rural King under the Roundup pro brand, however, they usually are not in stock and instead carry the less expensive brands that tend not to hold up well. Another option is to buy the Husqvarna labeled sprayer from Lowes. It is a Smith made sprayer with a Husqvarna label. Be sure to purchase the Husqvarna sprayer with the BLACK cap. They sell an orange cap model (made by someone else) which I cannot recommend. D.B Smith sprayers can also be found with a Scotts or Roundup Pro brand label. These are all made by Smith. Just be sure to discern the correct model for each one.

Basal Bark

My favorite treatment method for most situations. To treat via basal bark, an oil carrier must be used to penetrate the bark of the plant. This is accomplished by a diesel fuel or a basal oil. These oils are hard on plastics and seals. A good, dedicated, robust sprayer must be used for any long term use. If invasive species are very heavy in a stand, it may be more advantageous to invest in a backpack sprayer with Viton seals such as the DB Smith. The oils are still hard on the plastics in the sprayer, but it will last much longer than a cheaper backpack sprayer and allow much more spraying/comfort until it is empty.

If invasive species are of medium intensity or less, or if small areas are being treated, or if the ability to refill is easy/close, a 1.5 to 2 gallon hand sprayer will be the longest lasting and cheapest solution.

Cutting Tools

For cut stump treatments, tools include hand loppers, hand saws, and chainsaws. For smaller stems, hand loppers and hand saws may be the easier option. They are lighter, require no fuel or oil, and can be carried almost anywhere. On larger and multi-stem individuals, a gas or battery powered chainsaw may be a better option. Use what you have on hand and feel comfortable using.

A hack-n-squirt treatment is best executed with a modified hatchet. Start out with a cheap hatchet and grind the bit so that it is 1.25 to 1.5 inches wide. Using this modified tool creates a nice pocket in a tree that drives deep and holds the herbicide well. A normal hatchet doesn't provide as much penetration and the spray is more likely to run out of the cut.

PPE

Proper personal protective equipment is not only a great idea, it is also the law when using pesticides. Every label will go into detail on what is required to spray or use a pesticide product. In general, plan to wear disposable, chemical resistant gloves. A long sleeve shirt, chemical resistant boots with socks, a wide brimmed hat, and pants will help to keep spray off your skin. When mixing and spraying, wearing chemical resistant goggles can keep splash and spray out of your eyes.

If using a saw or axe to cut grapevines or trees for TSI, you must protect yourself from the hazards of working in the woods. A widow maker is a dead or broken tree branch/ top. If it falls, it has a good chance of causing serious injury and death. Even using hand tools to cut grapevines or trees can release a widow maker. Always be aware of your surroundings when working in the woods. A hard hat is your best friend and will protect you if something happens. When using a chainsaw, take extra caution and wear chainsaw pants or chaps along with any other PPE that is required for safe use.

Additional Considerations

Blue dye can be added to batches to monitor coverage and missed stems. Get a water-based pond dye. Add .4 to 1 oz per gallon or mixed to desired strength. A little will go a long way. While it generally will separate without mixing, this water-based pond dye can be added to basal bark mixtures without issues. They do make oil-based dyes which will not separate.

Glyphosate deactivates when it reaches the soil. Specifically, the calcium in the soil. When hard water is used, it can contain calcium and make treatments ineffective or less effective. If you have well water, which is not softened, experiment using a small batch to test effectiveness. The amount of calcium found in well water can vary from time to time, so use cation or treated/city water when able.

While spraying, be sure to wash your face and hands with soap and water before eating, drinking, using tobacco products, or using a cell phone, GPS unit, etc. After spraying, immediately wash clothes by themselves and get a shower with plenty of soap. This will help reduce the risk of pesticide contamination and contact.

Surfactants can be used to help wetting and adhesion of foliar treatments. While there are many different brands of surfactants that all have varying mixtures and rates, some do work better than others. I have never been a fan of certain surfactants sold at retail stores. They were always overly expensive, and I felt I had to use more than required to get decent results. One product I

have found to work well, sold in stores, is a surfactant sold at Rural King called "Hum-AC 820." It's a surfactant and humectant, meaning it will resist evaporative loss, especially in warm weather. I have found that adding .5 to 1 oz per gallon is effective.

Below includes a list of commonly found invasive species. These may or may not be present on your property. Under the Woodland Stand Description and Management recommendations page, I have included what species I found while visiting your property. There may be others that are less common or were overlooked during the initial site visit.

Refer to the Factsheet portion of the appendix. There you will find factsheets for each invasive species along with ways to treat them and what herbicides to use. I have listed what I use and what I found works well, but there are many more options available.

Disclaimer*

It is your responsibility to read and follow the label when applying and mixing herbicides. Using a herbicide "off label" is using any herbicide inconsistent with the label. This is against the law. Focus Forestry LLC is not responsible for the use and misuse of any pesticide product. Even when applied in a manner as described in this plan.

Invasive to target:

Ailanthus (Tree of Heaven): Tree of heaven is a smoothed bark tree with long compound leaves (see factsheet). Originally planted as an ornamental, has worked its way into our woods. This tree is fast growing and grows well on many different soil types. It spreads very well, with seeds traveling up to a mile or more. It is important to note that tree of heaven cannot be cut down. By doing so, will send a hormone response through the tree, releasing dozen to hundreds of root suckers that sprout. Instead, these trees must be treated by a basal bark application or hack-n-squirt. A hack-n-squirt using a herbicide with an active ingredient of imazapyr (brand name is Polaris, (Imazapyr 4, cheaper generic brand), others are available) is most effective. Imazapyr is very effective at moving through the tree. Mixture rates will vary, so refer to the label when mixing imazapyr or any other herbicide. I recommended the lighter mixture rate at about 12oz/ gallon with hacks no further than 1 inch apart. Imazapyr stays active in the soil for many years. This can result in off target kill if applied incorrectly. Only use imazapyr with extreme caution and experience.

A basal bark option is my personal favorite. Works very quickly, sometimes as little as two weeks whereas a hack-n-squirt treatment may take months or an entire growing season. A basal bark treatment using triclopyr at a rate of 20 to 25% is extremely effective.

Again, unlike other invasive, tree of heaven cannot be cut stump. It will block the herbicide from the cut surface and profusely resprout from the stump and roots. A basal bark or hack-n-squirt treatment must be used. To complete this treatment using an axe, make equally spaced cuts around the tree's trunk that penetrate a few growth rings. These cuts are then injected with approximately 1ml of herbicide solution. A typical household chemical squirt bottle can be used. Handheld pump sprayers can be used at low pressures.

Bush Honeysuckle: Bush honeysuckle is an understory shrub that can become quite large. When this invasive becomes thick, it can lead to understocked stands. A foliar spray using glyphosate is effective on smaller stems (3ft and less). Larger stems can be treated with a cut stump or a basal bark treatment using triclopyr as the active ingredient.

Another option would be to use an oil-based herbicide. These herbicides are mixed with diesel fuel and applied to the cut surface and any exposed portion of the stump and root flare. This acts like a basal bark treatment but with the stump being cut. These treatments can be very effective. Garlon 4, Triclopyr 4, and Relegate are also herbicides that can be mixed with diesel fuel and used for the same purpose. Be sure to look over the factsheets and read the product labels to decide what is best for you.

Privet: Privet is an understory shrub that can get quite large. Foliar spraying can be ineffective as the waxiness of the leaves allows the herbicide to run off. I'd recommend a cut stump treatment using loppers or a saw on the small stems with a triclopyr-based herbicide and treat similarly as bush honeysuckle. These invasive plants put a chemical/hormone into the soil that restricts other natives from growing and better allows their seeds to grow. This results in thick patches of privet with a few large stems and many smaller stems surrounding them. These patches continue to grow larger.

Autumn Olive: Autumn olive has slender leaves with the underside being paler than the top. It can be identified by having a small red fruit with silverish speckles. The biggest identifier is the small silver dots that can be found on the twigs, fruits, and undersides of the leaves. Treatment is much the same as privet and bush honeysuckle. Foliar treatment on smaller stems must be done with a triclopyr based herbicide, as glyphosate is ineffective at killing this species. I would recommend a cut stump treatment between July and December, but a basal bark application is effective as well.

Winged Burning Bush: Winged burning bush is a commonly planted ornamental. This invasive gets its name from its bright red color it attains in the fall. It stands out well and can be identified quickly from its leaf structure, twigs, and fruit. Like bush honeysuckle, it is opposite branched with oval, simple leaves. The twigs have raised corky fins. (Note, larger stems will often have these corky fins but are much smaller and sometimes not noticeable. There is a native burning bush that can resemble the invasive winged burning bush. It is differentiated by the absence of protruding wings on the twigs and a different shaped fruit that resembles a plus sign (*See factsheet on burning bush for pictures and examples). This plant is treated with a cut stump or basal bark treatment.

Multiflora Rose: Although generally considered a lower threat, it can still become quite thick when exposed to sunlight. Typically, as the stand canopy closes and limits light, the multiflora rose will slowly begin to die off. This will remove most of the need for a treatment of this plant. A foliar spray using glyphosate is recommended if you wish to remove it. Some find adding in triclopyr or 2-4D aids in removal. Times that will warrant removal of multiflora rose are if it becomes so thick that it limits light to the forest floor, preventing regeneration in understocked areas.

Japanese Barberry: Japanese barberry is treated with a foliar spray of glyphosate. Adding triclopyr can make it more effective. These shrubs tend to be less than 3 ft tall, but can occasionally attain taller heights. The twigs have spines and the living tissue of the roots will be

yellow. These can develop into thick patches that can prevent regeneration of quality sawtimber species. Japanese barberry has also been known for being a harbor for ticks.

Callery Pear: Callery Pear was a once commonly planted landscape tree that began expanding its way into forestland. It can be identified by its tear-drop shaped leaves which are finely serrated. In the spring, it will be most noted for its white flowers which have a strong odor. Its fruits are small, round, and covered in pale dots. Treatment of the callery pear can be cut stump, hack-n-squirt, basal bark, and foliar on short plants.

Oriental Bittersweet: Oriental bittersweet is a perennial invasive vine. It can be most detrimental to trees as the vine grows around the trunk, causing the tree to be girdled. Treatment involves cutting the vine and treating the lower portion with a cut stump herbicide mixture. Another treatment involves cutting the vines close to the ground and allowing them to resprout. These resprouted stems can then be sprayed with a glyphosate/triclopyr mixture. Oriental bittersweet is identified by the pale colored bark of the vine. It has round, waxy leaves with serrations. Its fruits are bright red, which are surrounded by a yellow husk.

White Mulberry: White Mulberry is a medium-sized tree that was originally brought over from Asia for silk production. It can be identified by its waxy leaves with medium serrations. These leaves will vary with the number of lobes ranging from zero to thirteen. White mulberry is not to be confused with the native red mulberry which has larger, hairy leaves with finer serrations. The Red Mulberry will have zero to three lobes per leaf. Treatment for white mulberry will most commonly be done with a basal bark, hack-n-squirt, or cut stump method. I would recommend a cut stump or basal bark method using a triclopyr based herbicide.

Japanese Honeysuckle: Japanese Honeysuckle is a perennial vine invasive species. It has opposite branching, smooth oval leaves, and a hollow stem. It grows a bluish black colored fruit. Treatment includes cutting the vine and applying a cut stump mixture to the freshly cut surface.

Wineberry: Wineberry is a bramble very similar to our native black raspberry. Its canes are covered in a thick, dense mat of red spines. Its leaves are pubescent, with thick short red hairs. Because of the hairy leaves, foliar spraying may be difficult. A mixture of glyphosate and triclopyr can be used with a surfactant to aid in wetting of the leaves. Basal bark is another option for control, especially for larger canes.

Garlic Mustard: Garlic Mustard is a biennial invasive species. It generally grows in moist, well-drained soils. Most often, I see this along mesic ravines or riparian areas. Treatment of garlic mustard is easy, simply pull the plant of the ground and move it to a place where it does not touch the soil. Herbicides with glyphosate or triclopyr can be used if it is overabundant or thick. This can be pulled in early spring. Until it flowers. Once it flowers, the plant will continue to seed even if it is pulled from the ground. Many will put the flowered plants in trash bags dispose of them properly.

Japanese Stilt grass: Japanese Stilt grass is a grass that produces prolific numbers of seeds and dies back each year. Its seeds are carried by animals, equipment, wind, and water. It spreads to areas of sunlight such as forest edge openings and canopy gaps. Its seeds remain viable in the seedbank for up to 7 years. This makes control difficult, often requiring repeat treatments for many years. I recommend trying to eradicate this species if it is currently at a manageable level. If not controlled, these grasses will create a thick understory blanket that voids all sunlight from reaching the forest floor. This species germinates in early May and usually goes to seed in September to October.

Stilt grass dies quite easily and is controlled with as little as a .5% to 1% glyphosate mixture. It is important not to treat stilt grass too early as the remaining seeds will regerminate unless you plan on a treatment twice that year. Usually, treatments in late July/early August are most successful. A pre-emergent can be sprayed that will prevent the grass from germinating. This is most effective along trails and in ditches or areas where the stilt grass is known to be. A pre-emergent called Prodiamine 65WDG is known to be effective if sprayed in March or early April.

Japanese Knotweed: Japanese knotweed is a perennial plant that grows well in streams and riparian areas. Their seeds are spread easily by water, and these plants grow in large, thick patches. They have somewhat triangular-shaped leaves and thick, zigzagging stems. I do not have a lot of experience treating Japanese knotweed. Most recommend a mixture of mechanical and chemical control. It is recommended to cut the plants down in mid to late spring, then follow up with a foliar treatment in late summer on the new shoots. A 2% mixture of glyphosate or triclopyr, or a mixture of both, has been reported to be effective.

Treatment Schedule															
Application Method	Jan	Feb	Early Mar	Late Mar	Early Apr	Late April	May	Early June	Late June	July	Aug	Sept	Oct	Nov	Dec
Hack-n-Squirt															
Basal Bark															
Cut Stump															
Foliar															

Key	
Acceptable Treatment Window	
Use Caution/Varying Effectiveness	
Unacceptable Treatment Window	

*General treatment schedule for Ohio and its invasive species. This is a guide for the most effective treatment periods for all invasive species.

Grapevine Control

Grapevines can become problems for trees, as large grapevines can completely cover certain trees and outcompete them for sunlight. The additional weight can cause failure of the trunk and branches, especially in heavy wind and ice. Often, it causes poor form and crooked tops. Not all grapevines need to be removed, as they do offer benefits to wildlife. Grapevines in crop trees should be targeted. Crop trees are any trees of acceptable form with current or future sawtimber value or a mast producing species that are beneficial to wildlife.

When?

Cut Grapevines as you encounter them across the stand.

Stewardship Goals This Accomplishes

- Improved growth and form in crop trees
- Improved mast production for wildlife on oak/hickory
- Improve Future Timber Harvest Stand

How?

Sever the vines completely in two locations. One at ground level and another cut where the vine will hang suspended off the ground. This makes identifying cut vines easier. If cut, these vines will be deprived of nutrients and water. The entire vine will die and rot on the tree.

Crop Tree Release

As the name implies, this treatment will select crop trees by eliminating the surrounding competition. This reduces stress on the crop tree, improves its growth and shortens rotation age, as well as providing a direct way to influence future stand competition. This treatment can be done in any area, assuming there are pole sized trees (4 to 10 inches.)

When?

As with any disturbance, these should be complete after invasive species removal. However, knowing that, this treatment can be started at any time in fitting areas.

Stewardship Goals This Accomplishes.

- Improve species composition for wildlife.
- Aid in firewood production if needed.
- Improves the future timber harvest stand

How?

Select a desirable pole sized tree. Fell or girdle (see factsheet on girdling) surrounding trees whose crowns are touching the crop tree's. Remove enough so that 3 or 4 sides are released. Do not remove larger sawtimber trees that are of higher value. Locate crop trees on a tree-by-tree basis. This is not always a whole stand treatment, but rather when a proper tree is found. If a desirable tree of proper species and form is found, select to release it. The removed trees can be used to support firewood production or left on the ground to decompose.

How to select a crop tree?

- Is it a desired species?
 - White oak group, red oak group, yellow poplar, black walnut, black cherry , any wildlife species, *sugar maple-red maple (when no others are present or when on a mesic site) *
- Is it free from rot or infection?
- Does it have desired form?
 - Straight stem (no leaners)
 - 20 feet or more to a major branch (applies to pole sized trees, smaller trees may have branches lower)
 - Well-developed crown with healthy foliage

It is important to begin crop tree release AFTER invasive species have been removed and successfully treated. The purpose of these activities is to improve growing space and conditions for crop trees, whether for wildlife, timber production, or aesthetics. Failure to do so will only improve growing conditions and space for invasive species.

How to girdle:

Not all trees can be felled. This might be because of inevitable damage to nearby trees and often the crop tree, or danger and difficulty to the feller. To avoid this, girdling the tree may be necessary. To girdle, make two complete cuts around the stem approximately 6 inches apart. Each cut must be complete with no sections left uncut. The tree will slowly die and decay. This will reduce the risk of damage to nearby trees as the girdled tree breaks apart and falls slowly over time. These dead standing trees, called snags, also provide benefits to wildlife such as woodpeckers

Cull Tree Removal

Cull tree removal is the removal of low value and poorly formed trees. This can include large trees as well as smaller ones. The key is to remove trees to improve the growing conditions for nearby or newly expected trees.

When?

Any time after all invasive species have been removed from the area

Stewardship Goals This Accomplishes

- Improvement to future timber harvest stand.
- Improve species composition for wildlife.
- Improve stand aesthetics.
- Firewood Production if needed

How?

Select cull trees and remove them by felling or a double girdle. Cull trees are trees which are worth less than the space they are occupying and should be removed. These would be trees with substantial rot, leaning greater than 10 degrees with no sawtimber value, undesirable species, and any tree that is not likely to survive until the next cutting cycle. Just because it is a small tree or potentially valuable species, does not mean it should not be culled. An example below is of a black walnut. It contains heart rot and would not be merchantable in a timber harvest. By cutting that tree low at the stump and flush, stump sprouting would occur and "restart" its growth. At that point, this tree could be viewed as a crop tree, removing surrounding trees to improve sunlight and reduce competition within the next few years as it progresses. Along with that, a method known as coppicing can be used to select individual stump sprouts (See Glossary).

Considerations

Just because a tree has no financial timber value, does not mean it has no value at all. Hollow and rotten trees can serve as homes to wildlife. Oaks with poor formed or rotten trucks will continue supplying a mast source. This is not only beneficial to wildlife but will also help ensure oaks will be present in the future timber stand. When cull trees are girdled, these dead standing trees are called snags. They can provide food sources to woodpeckers, perches for predatory birds, and homes for other wildlife.

It is important to begin cull tree removal AFTER invasive species have been removed and successfully treated. The purpose of these activities is to improve growing space and conditions for crop trees, whether for wildlife, timber production, or aesthetics. Failure to do so will only improve growing conditions and space for invasive species.

How to girdle:

Not all trees can be felled. This might be because of inevitable damage to nearby trees and often the crop tree, or danger and difficulty to the feller. To avoid this, girdling the tree may be necessary. To girdle, make two complete cuts around the stem approximately 6 inches apart. Each cut must be complete with no sections left uncut. The tree will slowly die and decay. This will reduce the risk of damage to nearby trees as the girdled tree breaks apart and falls slowly over time. These dead standing trees, called snags, also provide benefits to wildlife such as woodpeckers.

Timber Harvesting

Timber harvesting will likely be one of the most significant activities you undertake on your property. It has the potential to make substantial changes to the forest landscape, and once the trees are cut, there is no immediate way to reverse or remedy the situation. This is why the utmost care, attention, and planning must go into preparation for a sale.

Timber harvesting is an excellent tool you can use to manage your property. It can improve the health and vigor of your forest, remove damaged, overmature, and defective trees, and serve as a source of supplemental income. When done correctly, timber harvesting can be a sustainable, periodic source of income. Unfortunately, this is not always the case. This section will explain the acceptable harvesting methods as well as the poor or unacceptable practices. My goal is for you to have a better understanding of the timber harvesting process and what you need to know about it.

Types of Harvesting

Timber harvesting can be split into two categories: sustainable silviculture (proper management) and high grading (poor practices).

- Silvicultural management practices should be the only methods you use in your woods. These practices, commonly employed in Ohio's forests, include clearcutting, single-tree selection, group selection, intermediate cutting, and shelterwood harvesting.
- High grading is any cutting method that does not benefit the health, future quality, or sustainability of the forest. It generally involves harvesting the most valuable trees while leaving poor-quality trees behind. Many of these poor-quality trees should be harvested and removed from the stand. **Do not high grade your woods.**

Five Accepted Harvesting Methods

1. Single Tree Selection

This is the most common harvesting method. A true single-tree selection is an uneven-aged harvesting method that removes the same number and size of trees each cutting cycle. This allows for continuous and long-term harvesting of the stand. However, this method is best suited in northern hardwood-type forests and does not work well in oak-hickory forests in Ohio.

A true single-tree selection is very detailed and time-consuming, and many foresters in our region do not implement it properly if they try. Instead, most foresters, myself included, practice a modified version of single-tree selection, which I refer to as an "improvement harvest/cutting." In this method, a forester will mark and sell any trees that are mature, overmature, poorly formed, dying, rotting, or have high potential to develop these conditions before the next cutting cycle. This cutting process mimics small disturbances, favoring shade-tolerant species like beech and maple. **Post-harvest TSI (Timber Stand Improvement)** is crucial after a single tree selection. There will be several undesirable trees that should be cut that were not able to be

removed from the harvesting operation. Post-harvest TSI will ensure the best possible health and quality in the future. This step should not be ignored after a harvest.

2. Clearcutting

Clearcutting is the most controversial and often misunderstood harvesting method. It is an even-aged management technique that involves harvesting all trees 2 inches in DBH (Diameter at Breast Height) and greater. This method mimics natural stand-replacing events such as high winds, tornadoes, or stand-replacing fires. Clearcutting can be a great way to "restart" stands that have little or no acceptable growing stock or to harvest stands that have reached maturity and are not growing at an acceptable rate. Clearcut forest will regenerate (grow back) naturally with high-quality trees.

3. Group Selection(patch Clearcut)

A group selection (also known as patch clearcut or group opening) is an uneven-aged harvesting method that removes groups of trees, typically in cuttings ranging from 0.5 to 2 acres in size (or no more than 120 feet wide). This practice favors shade-intermediate species such as oak and some hickories. It is good for wildlife management, as it provides various successional stages and forest structures. This makes the forest more diverse and beneficial for wildlife.

4. Shelterwood Harvesting

A shelterwood harvest is used to regenerate oak and hickory species. It involves three cuts: a non-commercial prep cut, the harvest cut, and an overstory removal cut (made 10-20 years later). The goal is to thin the stand to 50 to 70 square feet of basal area, providing ideal conditions for oak regeneration. Once the oaks are well-established, the remaining overstory is removed. A potential issue with this method is that it can negatively affect the quality of the trees before the overstory removal cut, as the additional sunlight can cause epicormic sprouting, sunscald, or individual tree mortality. This practice is seldom used on private land.

5. Intermediate Cutting

An intermediate cutting is a harvest that takes place between the start of the stand and before a regenerative harvest. All the processes mentioned so far have the goal of regenerating or growing new trees from seedlings. An intermediate harvest frees space for better quality sawtimber. The lower quality sawtimber is removed, and the canopies of the remaining sawtimber will grow and occupy the remainder of the canopy. An intermediate harvest is essentially an improvement harvest (or improvement cutting) without allowing regeneration to occur.

These are the five commonly prescribed harvesting methods that may be recommended on your forestland. Other harvesting practices, such as sanitation cuts and seed tree harvests also exist, but these are not too commonly prescribed or recommended in eastern hardwood forests except under specific circumstances and situations. A forester will guide you in this process and work with you to decide which harvesting methods will be best to reach your goals and meet the forest's needs.

High Grading (Poor and Unacceptable Practices)

High grading is any cutting method that does not benefit the forest's health, future quality, or sustainability. High grading generally involves harvesting the most valuable trees, while leaving poor-quality trees behind, which should be harvested instead. High grading can take many forms and is often disguised as legitimate harvesting practices. Log buyers, loggers, bad foresters, and even landowners may unknowingly or intentionally high-grade the woods.

Four Types of High Grading

1. Diameter Limit Harvesting

This is one of the most common forms of high grading. A diameter limit harvest is based on a minimum diameter or diameter range. It is important to know that size alone should not determine whether a tree should be cut. A large tree may be perfectly healthy and growing in value, while a smaller, defective tree may not be. Diameter limit harvesting is easy to do, but it doesn't consider the health or financial maturity of the tree. This method typically takes most of the value from a stand, and previously diameter-limited stands often cannot be harvested for decades. A common misconception is that removing larger trees gives space for younger trees to grow. Many of these smaller trees are just as old as the larger and dominant trees of the stand. These "younger" trees are inferior genetic stock that has stunted growth. Many of these smaller They will never reach the size or quality of the trees that were removed.

2. Harvesting Based on Species

This method involves harvesting only the most valuable species, such as white oak or black walnut. This practice removes much of the forest's value, leaving behind only the poorer quality or less desirable trees. Stands that are high-graded by species become much harder to sell in the future, as most of the quality and value is gone. As a result, these stands will have fewer of the most desired species in the next harvest, altering the stand's quality for generations.

3. Logger Selection or Select Cut

Do not confuse logger selection with proper single-tree selection. In a select cut, a log buyer or logger chooses the trees they want to cut based on profit, often leaving behind trees that should be harvested for the health of the stand. These cuts are typically not marked, which makes it difficult for the landowner to understand what they are selling. Logger selection can harm the stand's future value and health. A select cut often sounds appealing to a landowner who simply believes a log buyer will only harvest the trees that "should" go.

4. Agreed Sale or Marked with/by Landowner

In this method, a log buyer walks the property with the landowner to point out trees of interest. If the landowner agrees, the trees are marked for sale, giving them a sense of control. However, there are a few issues with this approach. First, it assumes the landowner knows which trees should be harvested to benefit the forest. One of many common misconceptions is that smaller

trees are always younger trees. Many of these smaller trees may need to be harvested to improve the health, value, and vigor of the stand.

Additionally, the log buyer will typically only suggest the trees they want to cut, leaving behind defective, poorly formed, or undesirable trees. Removing these trees is essential for improving the forest. By leaving them behind, no matter what other timber is cut, the result is still high grading.

Landowners, too, can also unintentionally high grade their property. This can happen when cutting firewood, sawing for their portable sawmill, or cutting for wildlife purposes. There are often numerous alternatives that can achieve the same desired outcome without resorting to high grading. Many landowners are unaware of this and will cut the best quality timber from their property.

The four high grading methods listed above are cutting practices that will hurt, damage, and degrade the quality and value of your forestland. Any good forester will steer you clear of these practices and offer acceptable practices that improve the health and quality of your forest stands. The consequences of high grading will remain with the forestland for generations and possibly forever.

Six Steps to Harvest Your Trees

Now that we understand the proper and improper ways to harvest your woods, the next question is: How do I harvest my trees?

1. What Focus Forestry Can Do for You

The most important step is to acquire the assistance of an ethical and professional forester. Focus Forestry LLC will work with you to develop a custom timber harvest plan. This will consider your goals and what is best for the health and quality of the forest. We will sell the trees for you on your behalf, helping to make certain the process goes smoothly. I will not only mark the right trees, but also ensure you are being compensated appropriately for your sawtimber. You will receive more for your timber if it is sold with a forester.

2. Mark and Measure Volume

Before selling anything, it is important to know what you are selling and approximately how much it is worth. I will mark and measure every tree that will be included in the sale. This will provide you with a tally of species and volume. This tally will be included in a timber prospectus to attract potential buyers.

3. The Bid Prospectus

A bid prospectus (or bid package) will be prepared for the sale. This is an advertisement for your sawtimber and will give instructions on how to bid. This will be advertised to as many interested buyers as possible. This will be a competitive and open market sale that will pay you the true market price of your timber. The sealed bid will be opened publicly. At that time, the winning bidder will be rewarded, and your timber has now been sold.

4. Payment

You will receive payment in two parts. A down payment is owed with the bid, and the remainder will be paid out before the harvesting operation begins. Stumpage refers to the value of standing trees. Your timber will be sold as a lump-sum based on stumpage, not on a pay-as-you-cut or percentage-based basis. This ensures you will be fully compensated for every tree as it stands.

At this time, I will be compensated for administering the sale. I will work for a fee or on a commission.

5. The Harvesting Operation

During the harvesting, I will monitor the progress of the operation. Before the logging crew is finished, I will inspect your forest and make sure everything has been handled properly. This will include inspecting all trees, making sure only the trees marked for sale are taken, and that no remaining trees have been damaged. I will make sure BMPs are in place and implemented properly. I will make sure your forestland is properly reclaimed and restored.

6. Timber Stand Improvement

You have just successfully sold your timber, but wait, you are still not done! One important step following any timber sale is post-harvest TSI. Post-harvest TSI will improve the forest stand further, improving health, quality, and value of your stand. The key takeaway is that timber harvesting is not just a source of income, but instead, a valuable tool for forest management. The trees that are left behind are crucial for the long-term health of your forest.

Appendix

Woodland Resource Descriptions

General Soils Information

Soil Type(s): Primary soil types of forestland are **Dekalb-Westmoreland Complex**

General description of soil:

These soils have a N. Red Oak site index of 62. Site index indicates how tall dominant and codominant trees will grow in the stand during a specific period(50 Years). An oak site index of 65 and below is considered poor, 66 to 80 is good/moderate, and greater than 80 is considered excellent.

Timber Information- There have been several harvests on this property. Most recently, a harvest occurred around 5 years ago. This was a heavy diameter limit harvest of 8 to 10 inches DBH. Stand 2 is a nice oak stand with quality sawtimber. I could see this stand supporting a timber sale if markets are correct.

Wildlife- The landowners have goals of supporting wildlife. There are plenty of opportunities for wildlife on the property. Girdled trees can provide a source of value to wildlife. These dead standing trees can become homes, food sources, and perches. Landowners are deer hunters and currently have plenty of food and bedding on the forest floor as a result of the most prior harvest.

Water- A few intermittent streams are located on the property. to the south, the Hocking River crosses over onto the property.

Historical- Prior site of the Hocking Canal in stand 3

Access- Good access off Rainbow Drive. Each stand is accessible via trails or paths.

Best Management Practices- BMPs or best management practices have been implemented to protect stream and water quality. Not using BMPs will lead to sedimentation in waterways (which can kill aquatic organisms and stun fish populations) but can also lead to severe rutting and erosion of the soil on your property. Ohio Administrative Code 1501:3-12-02 states: *"Each owner, operator, or person responsible for a silvicultural operation shall prevent pollution caused by wind or water erosion. Silvicultural operations shall apply conservation practices in accordance with "BMPs for Erosion Control for logging and Forestry Practices in Ohio," which are available to all Ohio county soil and water conservation districts, or other appropriate methods or management practices approved by the chief or chief's designee"*.

This includes but are not limited to; water bars on skidding roads, avoiding skid roads perpendicular to the slope, using culverts and bridges at stream crossings, moving heavy equipment when the soils are dry, creating sedimentation traps, and reseeding bare mineral soil along skid roads after harvesting operation is complete (See factsheet section for BMP manual)

Forest Health – Forest Health is generally good. Some trees are in decline, but nothing out of the ordinary.

Threatened & Endangered Species: None Found.

Specific information on threatened or endangered species may be obtained by contacting the Ohio Department of Natural Resources Division of Wildlife directly to access the "Ohio Biodiversity Database":

ODNR - Division of Wildlife
2045 Morse Road, Bldg. G-3,
Columbus, OH 43229-6693
Phone: (614) 265-6452

Fire - In the right stands, fire can be used as a tool to promote certain oak and pine species. Oaks invest time and energy into their root system. They develop thicker bark and are generally more drought tolerant. Competing species such as maple, beech, and yellow poplar have thin bark and a shallow root system. These species are killed during a fire, thus reducing the competition for the oaks.

Another benefit of fire is that it allows nutrients otherwise unavailable to plants to become readily available in the soil. A thick flush of herbaceous plants will quickly cover the forest floor. Historically, fire was a part of the natural forest landscape. The fire regime in SE Ohio was generally of moderate intensity and happened anywhere from 7 to 35 years. Stand replacing fires were much more infrequent.

In Ohio, very little prescribed fire happens on private land. This is due to the risk and preparation that must happen to have a safe and effective burn. Naturally occurring fires do not have the same effect as they once had. Roads and other fire breaks create barriers, decreasing the fires' ability to spread. Additionally, wildland fires are unpredictable and can damage personal property and hurt people. These wildfires are generally put out.

Carbon Cycle -- Healthy, sustainably managed forests can help to store carbon: Carbon is stored in the form of living trees, forest wood products, and coarse woody debris. It is not until the wood is decomposed that the carbon is released. By managing forests to be healthy and fully stocked, the amount of carbon stored can be maximized.

Forests of Recognized Importance (FORI) -- The Ohio Tree Farm Committee has not designated any Forests of Recognized Importance (FORI) outside of those designated by the State on public lands.

Soil Map Legend

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Bhk4F	Bethesda channery silt loam, 25 to 70 percent slopes, unreclaimed, highwall	0.0	0.0%
DtE	Dekalb-Westmoreland complex, 25 to 40 percent slopes	6.3	2.2%
DtF	Dekalb-Westmoreland complex, 40 to 70 percent slopes	59.9	21.1%
DuF	Dekalb-Westmoreland complex, benched, 40 to 70 percent slopes	1.7	0.6%
FbF	Fairpoint shaly clay loam, 40 to 70 percent slopes	0.0	0.0%
FcA	Fitchville silt loam, 0 to 3 percent slopes	4.7	1.6%
GmB	Glenford silt loam, 3 to 8 percent slopes	4.6	1.6%
GmC	Glenford silt loam, 8 to 15 percent slopes	3.0	1.1%
GsB	Guernsey silt loam, 3 to 8 percent slopes	0.7	0.2%
Hay1AF	Haymond silt loam, 0 to 3 percent slopes, frequently flooded	89.7	31.7%
Hay1AO	Haymond silt loam, 0 to 3 percent slopes, occasionally flooded	24.3	8.6%
New1AF	Newark silt loam, 0 to 3 percent slopes, frequently flooded	8.7	3.1%
RcD	Richland loam, 15 to 25 percent slopes	11.0	3.9%
VbE	Vandalia-Brookside complex, 25 to 40 percent slopes	17.9	6.3%
W	Water	9.2	3.3%
WdB	Wellston silt loam, 3 to 8 percent slopes	3.3	1.2%
WhD	Westmoreland-Guernsey silt loams, 15 to 25 percent slopes	12.4	4.4%
WmD	Westmoreland-Upshur complex, 15 to 25 percent slopes	25.9	9.1%
Totals for Area of Interest		283.3	100.0%

Soil Suitability Legend

(N. Red Oak Site Index)

MAP LEGEND

Area of Interest (AOI)
 Area of Interest (AOI)

Soils
Soil Rating Polygons
 ≤ 62
 > 62 and ≤ 75
 > 75 and ≤ 78
 > 78 and ≤ 81
 > 81 and ≤ 88
 Not rated or not available

Soil Rating Lines
 ≤ 62
 > 62 and ≤ 75
 > 75 and ≤ 78
 > 78 and ≤ 81
 > 81 and ≤ 88
 Not rated or not available

Soil Rating Points
 ≤ 62
 > 62 and ≤ 75
 > 75 and ≤ 78
 > 78 and ≤ 81
 > 81 and ≤ 88
 Not rated or not available

Water Features
 Streams and Canals

Transportation
 Rails
 Interstate Highways
 US Routes
 Major Roads
 Local Roads

Background
 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Athens County, Ohio
 Survey Area Data: Version 27, Aug 27, 2025

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 21, 2023—Aug 19, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

**Forest Productivity (Tree Site Index): northern red oak
(Schnur 1937 (820))**

Map unit symbol	Map unit name	Rating (feet)	Acres in AOI	Percent of AOI
Bhk4F	Bethesda channery silt loam, 25 to 70 percent slopes, unreclaimed, highwall		0.0	0.0%
DIE	Dekalb-Westmoreland complex, 25 to 40 percent slopes	62	6.3	2.2%
DIF	Dekalb-Westmoreland complex, 40 to 70 percent slopes	62	59.9	21.1%
DuF	Dekalb-Westmoreland complex, benched, 40 to 70 percent slopes	62	1.7	0.6%
FbF	Fairpoint shaly clay loam, 40 to 70 percent slopes	76	0.0	0.0%
FcA	Fitchville silt loam, 0 to 3 percent slopes	80	4.7	1.6%
GmB	Glenford silt loam, 3 to 8 percent slopes	88	4.6	1.6%
GmC	Glenford silt loam, 8 to 15 percent slopes	88	3.0	1.1%
GsB	Guernsey silt loam, 3 to 8 percent slopes	78	0.7	0.2%
Hay1AF	Haymond silt loam, 0 to 3 percent slopes, frequently flooded		89.7	31.7%
Hay1AO	Haymond silt loam, 0 to 3 percent slopes, occasionally flooded		24.3	8.6%
New1AF	Newark silt loam, 0 to 3 percent slopes, frequently flooded		8.7	3.1%
RcD	Richland loam, 15 to 25 percent slopes	80	11.0	3.9%
VbE	Vandalla-Brookside complex, 25 to 40 percent slopes	77	17.9	6.3%
W	Water		9.2	3.3%
WdB	Wellston silt loam, 3 to 8 percent slopes	81	3.3	1.2%

Map unit symbol	Map unit name	Rating (feet)	Acres in AOI	Percent of AOI
WhD	Westmoreland-Guernsey silt loams, 15 to 25 percent slopes	81	12.4	4.4%
WmD	Westmoreland-Upshur complex, 15 to 25 percent slopes	81	25.9	9.1%
Totals for Area of Interest			283.3	100.0%

Description

The "site index" is the average height, in feet, that dominant and codominant trees of a given species attain in a specified number of years. The site index applies to fully stocked, even-aged, unmanaged stands.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this attribute, only the representative value is used.

Rating Options

Units of Measure: feet

Tree: northern red oak

Site Index Base: Schnur 1937 (820)

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Interpret Nulls as Zero: No

Soil and Suitability Map provided by USDA, Web Soil Survey.

Forestry Terms

- **DBH:** Diameter at breast height (4.5 feet up from the uphill side of the tree)
- **Shade Tolerant:** species that can persist with little sunlight in the understory (Maple, Beech)
- **Shade Intolerant:** Species that require full sunlight to grow (Cherry, Yellow Poplar)
- **Shade Intermediate Tolerant:** Species that require partial light and partial shade (Oak)
- **Seedling:** Trees which are less than 1 foot tall
- **Sapling:** Trees which are greater than 1 foot tall and less than 4 inches DBH
- **Pole:** Trees that are greater than 4 and less than 10 inches DBH
- **Sawtimber:** Trees greater than 10 inches DBH
- **Mesophilic/ Mesic:** Sites which are moist and well drained
- **Xeric:** Sites which are dry
- **Hydric:** Sites which are wet and often hold water
- **Treatment Methods**
 - **Basal Bark:** Treatment to control unwanted woody plants where a herbicide is mixed in a diesel fuel or oil carrier. This is applied 18 to 20 inches along the bottom of the trunk and root flares.
 - **Hack-n-Squirt:** Treatment where cuts or "hacks" into the trunk of a tree (usually with 1 inch between cuts) are then injected with a small amount of herbicide
 - **Cut Stump:** Treatment where the unwanted plant is cut flush to the ground with loppers or by chainsaw. A water or oil-based herbicide solution is applied immediately after stem has been cut.
 - **Foliar Spray:** Treatment where the foliage of the unwanted plant is sprayed
- **Timber Stand Improvement:** Management activities that improve growing conditions and stand characteristics for timber, wildlife, and aesthetics
 - **Crop Tree Release:** TSI method which quality crop trees are selected and released by removing surrounding trees
 - **Cull Tree Removal:** Removal of cull trees, which have little to no value
 - **Group Opening (as TSI Method):** 1/2th to 1 acre opening to increase sunlight to the forest floor.
 - **Thinning:** Used to reduce basal area in a stand. May or may not be commercial, but usually removing inferior trees and trees with poorer canopy position.
 - **Midstory Control:** A TSI method that removes a shade tolerant midstory in preparation of or after harvesting to increase sunlight to the forest floor and property opportunities for regeneration.
- **Directional Fell:** Removing a tree by cutting at the base with a hinge.
- **Girdle:** Killing a tree by cutting two continuous rings around its trunk, depriving its water and nutrient supply
- **BMP:** Best management practices to protect soil and water quality
- **Crop Tree:** Tree of high quality, good health, and desired species for management objectives
- **Cohort:** A group of trees with similar ages
- **Rotation Age/ Cutting Cycle:** Term used to define the cutting period most timber will financially mature.
- **Coppicing:** Method used to select individual stems by cutting a tree at the base and allowing it to sprout. These sprouts are further selected for desirable traits
- **Sustainability:** An idea or method of harvesting forest products to ensure their quantity and quality for future use
- **Snag:** Dead standing tree
- **Aspect:** Direction that a slope faces (If I dropped a ball on a slope, which way does it roll?)

Factsheets

The sections below include factsheets on invasive species control and TSI activities. This section is long and comprehensive. Use this as a tool and resource. I have selected many of these as I have found them to be rather good. However, these are not perfect and may include incorrect information. For example, the OSU factsheet on Tree of Heaven states you can cut stump Tree of Heaven. This is wrong. Do not do that. I like everything else about that factsheet, but that point is simply wrong. Unfortunately, the author refuses to change it and argues that you could cut stump under extended circumstances. Use my recommendations in conjunction with what the factsheets say to better inform yourself. Search for any additional information you have questions on, or contact me directly, and I can answer them by phone.

Below are links to a google drive folder. If you do not have this document as a PDF, simply type in the links into a computer's address bar.

Invasive Species Control

Treatment Methods

https://drive.google.com/file/d/1HUiB4C2JngshYjUcTl3HnZsTW0EXA7eu/view?usp=drive_link

Hack-n-Squirt

https://drive.google.com/file/d/1lrDi2TbkcUKlAbJ1rC-04WUCU2NyqtW9/view?usp=drive_link

Basal Bark

https://drive.google.com/file/d/1-jh0njRsyEmPPfVrTO5OigXN52YiSeXH/view?usp=drive_link

Tree of Heaven

https://drive.google.com/file/d/1uLba2qSkF-JqTQhUUy3dRAj2cfhT_bAK/view?usp=drive_link

Japanese Barberry

https://drive.google.com/file/d/1wVppdVASMP69TsC9B1gKfnli4c0CKWnX/view?usp=drive_link

Privet

https://drive.google.com/file/d/1nWvgR3MPR54IKNA8o9qVoMplyWe3VzF3/view?usp=drive_link

Bush Honeysuckle

https://drive.google.com/file/d/15-rBIKyyTC_oz1pZyZeHiBF-EPRF15yP/view?usp=drive_link

Autumn Olive

https://drive.google.com/file/d/1c8o5wDcnKCESbiV7STiIZTOAiRYsCuNy/view?usp=share_link

Multiflora Rose

https://drive.google.com/file/d/1Bzpi-gE4NRagYKtkjnTHEoiPSG9BhpKM/view?usp=drive_link

Japanese Honeysuckle

https://drive.google.com/file/d/1kt4mdnNJoP-9R9zHA_4XUtT1CfOlwf4o/view?usp=drive_link

Amur Cork Tree

[https://drive.google.com/file/d/1oFX78Q_pL7CnqyU0W8ByybiemK4YxA89/view?usp=drive link](https://drive.google.com/file/d/1oFX78Q_pL7CnqyU0W8ByybiemK4YxA89/view?usp=drive_link)

White Mulberry- ID ONLY

[https://drive.google.com/file/d/15P3Z6r5VnjglZWV0rMt93OVSNEIQr3U0/view?usp=drive link](https://drive.google.com/file/d/15P3Z6r5VnjglZWV0rMt93OVSNEIQr3U0/view?usp=drive_link)

Callery Pear

[https://drive.google.com/file/d/1nKt8p_JeUzIJEFrIFyp6Ba8C7U_pLnD0/view?usp=drive link](https://drive.google.com/file/d/1nKt8p_JeUzIJEFrIFyp6Ba8C7U_pLnD0/view?usp=drive_link)

Oriental Bittersweet

[https://drive.google.com/file/d/1a8VXx_v45HYpNLTtVXHRnpbSgOc7Pjt/view?usp=drive link](https://drive.google.com/file/d/1a8VXx_v45HYpNLTtVXHRnpbSgOc7Pjt/view?usp=drive_link)

Jap. Stilt Grass

[https://drive.google.com/file/d/1s2uJJ8LBqLLP6Zlpnq5B1aOtiOtR1L0r/view?usp=drive link](https://drive.google.com/file/d/1s2uJJ8LBqLLP6Zlpnq5B1aOtiOtR1L0r/view?usp=drive_link)

TSI

Forest/Timber Stand Improvement

- #1 [https://drive.google.com/file/d/1-ORWvQPmnBpeCs00f94X9Y4Pw9umrV3M/view?usp=drive link](https://drive.google.com/file/d/1-ORWvQPmnBpeCs00f94X9Y4Pw9umrV3M/view?usp=drive_link)
- #2 [https://drive.google.com/file/d/104unRFai6ikLYpiouRTN9WojkpyXD04U/view?usp=drive link](https://drive.google.com/file/d/104unRFai6ikLYpiouRTN9WojkpyXD04U/view?usp=drive_link)

Tree Planting

[https://drive.google.com/file/d/1E9Snpwrjp4uDnnxtapESL8AbTlgPOyej/view?usp=drive link](https://drive.google.com/file/d/1E9Snpwrjp4uDnnxtapESL8AbTlgPOyej/view?usp=drive_link)

Crop Tree Release (Technical)

[https://drive.google.com/file/d/1hrTKex67cxzURIUCjmbjczUtRAtkySiY/view?usp=drive link](https://drive.google.com/file/d/1hrTKex67cxzURIUCjmbjczUtRAtkySiY/view?usp=drive_link)

Crop Tree Release (Simple)

[https://drive.google.com/file/d/1AAAPAIK5KF5vE-1YWeSqEdp_ULdgYwHT/view?usp=drive link](https://drive.google.com/file/d/1AAAPAIK5KF5vE-1YWeSqEdp_ULdgYwHT/view?usp=drive_link)

NEW Ohio BMP Manual

[https://drive.google.com/file/d/1F9v_6JqMOXpxV4X0hXtgSzL0fPzIge3_/view?usp=drive link](https://drive.google.com/file/d/1F9v_6JqMOXpxV4X0hXtgSzL0fPzIge3_/view?usp=drive_link)

Girdling and Other Woody Control Methods

[https://drive.google.com/file/d/1cxtRbzh-5HUPUZqe_teggM2onW_rPQ2Y/view?usp=drive link](https://drive.google.com/file/d/1cxtRbzh-5HUPUZqe_teggM2onW_rPQ2Y/view?usp=drive_link)

Other

Maple Syrup Production

[https://drive.google.com/file/d/1q_EE9JkCVKRIIf9CtN-v7lT29QIYJCab/view?usp=drive link](https://drive.google.com/file/d/1q_EE9JkCVKRIIf9CtN-v7lT29QIYJCab/view?usp=drive_link)