



Crowe Forest Management, LLC

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NALLY FOREST MANAGEMENT PLAN – FARM (27 ACRES)

Location: The woods is located approximately .25 mile north and .25 mile east of the intersection of State Road 14 and County Road 475 West which is in section 1 of Cleveland Township of Whitley County, Indiana

Watersheds: This woods is located in the Eel River Watershed of the Wabash River Watershed which empties into the Ohio River and then the Mississippi River before going into the Gulf of Mexico.

Objectives: The purpose of the inspection is to evaluate the condition of the trees and to develop forest management recommendations. The following recommendations are based on your objectives to maintain a healthy, productive, and aesthetically pleasing woods, while reducing soil erosion, improving air and water quality and maximizing plant diversity and wildlife habitat.

SOILS AND TERRAIN

Soil Types: The main upland soil types in this woods are Morley loam with slopes that range from 3% to 20%, Glynwood loam with 3% to 6% slopes, and Blount silt loam with 0 to 4% slopes. The depressional soil is mainly Pewamo silty clay loam. The elevation ranges from 804 to 844 feet above sea level.

Soil Descriptions: The Morley and Glynwood soils are deep, moderately well to well drained, moderately sloping, productive forest soil. The Blount soil is a deep and somewhat poorly drained forest soil. These soils are well suited to most hardwood species.

The Pewamo soil is a deep, poorly drained, productive soil found in depressions. The depressional soils can be productive, however they are limited to water tolerant species due to excessive wetness.

Soil Productivity: The site indexes for the Morley soil is 90 for tulip poplar and 80 for red oak and white oak. The site indexes for the Glynwood soil is 80 for red oak and white oak. The site indexes for the Blount soil is 65 for white and red oak. The site indexes for Pewamo soil is 90 for pin oak and 71 for red maple. Site index is a measure of the height of the dominant stand of trees at 50 years. In general the higher site indexes produce taller trees and more volume growth per acre per year hence the site is more productive.

Topography: This woods measures approximately 27 acres. This woods has rolling topography that generally drains to the north with one small stream originating from the neighbors wetland and bisecting the woods in the northern end. About 2 acres in the southeast corner drains southward into a wetland that spans the property line.

WOODLAND HISTORY

Livestock Grazing: This woods, like most woods in Indiana was likely grazed by livestock. The livestock generally was removed at least 40 to 50 years ago. Damage that typically occurred was a change in the species composition with an increase in distasteful trees like shagbark and bitternut hickory, black walnut, and buckeye. In addition, the root systems of the shallow rooted trees were damaged due to compaction from the animal's hooves. This damage often resulted in hollow trunks. The sugar maple, beech, and basswood were the most susceptible to the damage followed by the red oak species.

Timber Harvests: This woods was cut within the last three years. This harvest was a "high-grade" and targeted the best stems that were in the woods, leaving very few solid trees above 20 inches in diameter at breast height (DBH). The more valuable species and the better quality trees were mostly included in the harvest.

WOODLAND DESCRIPTION

Stocking: The stand is moderately well stocked to somewhat understocked in some areas with basal areas between 30 and 100 square feet per acre and an average basal area of around 60 sq. ft./ ac. Trees in the overstory range from 8 inches DBH to 30 inches DBH with many of the trees above 20 inches DBH being hollow. The average DBH of the overstory trees is around 12 inches DBH, at this average DBH it would require a Basal Area of 75 sq. ft./ac. or greater to be considered well stocked.

Species Composition: This woods is a mixed hardwoods stand that is dominated by sugar maple. The next most abundant species in the stand are red oak, basswood, American beech, and bitternut hickory. Other species present in the overstory include black cherry, tulip poplar, shagbark hickory, American elm, red elm, chinquapin oak, white oak, and black walnut. The understory is of moderate density, easy to walk through but seedlings and saplings are abundant with many developing since the harvest. The understory is predominantly sugar maple and ironwood but also contains buckeye, hackberry, blue beech, American elm, red elm, Kentucky coffee tree, black cherry, red oak, and chinquapin oak. It is quite possible that there are also seedlings from all of the other overstory species but they would be found at a low frequency as they did not show up in the inventory.

Although the past harvesting has negatively impacted the woods, there are enough desirable trees present in the residual stand that the woods can still be productive in the future. The key is to weed the woods to ensure that the more valuable future trees are able to out compete the more abundant lesser trees.

Invasive Species: Exotic and invasive multi flora rose, Asian bush honeysuckle, and autumn olive were all observed in this woodland. The frequency of these species was low within the

woods and a little more frequent on the edges. With a recent harvest the interior of the woods has been disturbed and there is a potential for these exotic invasive species to spread quickly. Current coverage is approximately 10 percent.

MANAGEMENT RECOMMENDATIONS

Cost share assistance is likely available to complete the recommended work (Brush Management and Timber Stand Improvement) thru the Whitley County USDA – Natural Resource Conservation Service Office (located with the Soil and Water Conservation District). The District Conservation (Amy Lybarger) can be contacted at 260-244-6780 ext 3.

Brush Management – Practice 314: A few Asian bush honeysuckle and multi flora rose are present in the woods with heavier numbers located generally on the edges. Timber stand improvement will control the invasive species found in the interior of the woods but a follow-up treatment should be used for the next couple years on the interior and especially the edges to prevent them from seeding into the interior of the woods. The edges are easy to monitor and fairly easily controlled by spraying from the fields. The interior of the woods should also be treated with a foliar application of herbicide to control any sprouts or plants that develop from the existing seed bank. Current coverage is less than 10 percent overall although several areas, primarily on the edges have more concentrated infestations.

Timber Stand Improvement (TSI) – Practice 666: Timber stand improvement would be very beneficial at this time. The TSI would be in the form of crop tree release, cull tree control, under story treatment of undesirable species, grapevine control, and invasive species control. Approximately 15 sq. ft./ac. of basal area and over 100 understory trees should be killed per acre.

In **crop trees release** the best future crop trees are selected and less desirable trees that are competing with them are killed. This is done to improve the growth and vigor of the most valuable trees. Most of the crop trees that should be released are post to small sawlog sized (6 to 14 inches, DBH). Crop trees are selected based on their species, quality, size and proximity to other future crop trees. The desired stocking level for the upland area is 70 to 90 square feet per acre. Any walnut, white oak species, red oak species and black cherry should be favored followed by sugar maple, tulip and basswood. Bitternut hickory should be favored over the other hickory species. Oak species and soft maple should be favored in the lower areas. The crop trees should be released on at least 2 sides with the walnut and the oaks released on three sides.

It is recommended to kill much of the undesirable understory to eliminate or significantly reduce the seed bank. Through the reduction in the seed bank of the undesirable species desired natural regeneration has a better chance to become established thus increasing future profitability. Undesirable species that should be killed include elm, buckeye, ironwood, and blue beech in addition to all invasive species (multi flora rose and Asian bush honeysuckle). It is important to maintain at least a few of all the native species to increase the plant diversity.

Cull trees are unmerchantable trees that have damage (hollow trunks) or poor form that will prevent them from developing much value and / or volume. Cull trees should be deadened unless they are a desirable species not represented or sparsely represented in the woods. The cull trees in this woods occupy a significant area that is being underutilized.

Timber Harvest: The next harvest should be in approximately 10 years. This will allow for invasive species control, vine removal, and understory treatment to be done. In addition this should promote desirable advanced regeneration to develop prior to the harvest. The timing of the harvest will depend on your objectives and the condition of the woods. This should be an improvement harvest that should concentrate on the lower quality trees or less desirable trees competing with the better future crop tree. We recommend working with a forester who represents your best interest not one that is not associated with a timber company.

Future Recommendations: This woods should be harvested on a regular schedule, typically at 10 year intervals. Harvesting at this interval maintains trees until they have reached their biological and economic maturity to maximize the long-term returns from the woods while maintaining the flexibility to move up or delay a harvest should the need arise due to storm or drought damage, new pathogens, or economic necessity.

All harvests should be marked by a forester to ensure the correct trees are selected for harvest and should be sold on as a competitive bid sale with all companies bidding on the same trees under the same terms to ensure a fair price is obtained for the timber. The harvests should use a combination of group selection to create the conditions to promote desirable regeneration and single tree selection to commercially thin less desirable trees and salvage any trees that develop problems. In addition all harvest should concentrate on improving the future condition and long-term productivity of the woods. In general, if a tree will decline before the next harvest it should be taken at this time assuming it does not adversely affect other trees or the regeneration. Conversely if a tree will improve at an acceptable rate it should be left, especially if it is a high quality tree of a desirable species. A common analogy would be to always cull the herd, maintain your high quality stock therefore producing the best quality possible. It is likely timber stand improvement (weeding) will be beneficial after each subsequent timber harvest.

GENERAL INFORMATION

Ash Problems: In 2002 Emerald Ash Borer, an exotic insect, was identified after being introduced in the Detroit area from China an estimated 10 years earlier. As an exotic insect there are no biological controls and it is spreading rapidly since being found in Steuben and Lagrange Counties in Indiana in 2004. Since being introduced it has devastated the ash in northeast Indiana, Michigan, northwest Ohio and Ontario.

Pesticides are unlikely to be effective on a large scale due to the insect's life cycle and although there is hope that a parasitic wasp, recently imported from Asia will provide some control, it is not anticipated that the control will be soon enough for areas that are currently infected. Therefore, the outlook for ash in this area is not good and it is anticipated the ash will follow the elm and succumb. My current recommendation is to manage away from the ash, as I doubt the economic viability of the species in the immediate future.

Invasive Species Concerns: Any bush honeysuckle or ailanthus found in the woods should be cut and treated with herbicide immediately. Bush honeysuckle tolerates shade and can eventually overtake the under story of a forest. Ailanthus is a severe threat in that it will invade forest openings by growing aggressively in colonies from either seed or from root suckering off

of other Ailanthus trees. The bush honeysuckle is fairly easy to identify and can be controlled best in the March or April or in late October or November when it is typically the only green foliage present in the woods. Effective control can be obtained at that time using a foliar application of Round-up or Crossbow. The Ailanthus can be identified by a very large compound leaf that has a strong undesirable smell when broken. The Ailanthus will mostly be present in openings and a cut stump treatment or pulling the seedling from the ground will be the most effective control method. Other species of concern include privet, burning bush, Japanese barberry, glossy buckthorn, multi flora rose, and oriental bittersweet.

Field Edges and Invasive Species Control: Most of the invasive species begin at the edges of the woods, adjacent to the crop fields and in the fence rows. In the early stages of the invasion they are easy to control through foliar applications of herbicide. This can often be done using farm sprayers after the crops are harvested. In addition to controlling the invasive species it will prevent the woods from encroaching into the crop field. Preventing seed production is imperative to effective control due to the highly prolific nature of these aggressive species.

Woodland Wildlife Considerations: The timber stand improvement will create snags that will provide food (insects) for the birds and perches for the hawks and owls. At least 6 snags should be left per acre. All hickory trees that are killed during the timber stand improvement operation should be girdled and left standing. Den trees, particularly near the edge of the woodland should be left for wildlife. With the exception of the exotic invasive species, all species should be maintained.

Additional Information: Additional information on how to properly manage your woods to maximize its long term productivity is available on websites from Purdue University and the Woodland Steward Institute, a nonprofit group made up of representatives from various forestry groups such as Purdue, Indiana Division of Forestry, Society of American Foresters, Association of Consulting Foresters, Indiana Woodland Owners Association and The Nature Conservancy etc. The Websites are:

www.inwoodlands.org

www.fnr.purdue.edu

If you have any questions regarding the forest management recommendations, the invasive species control, the timber stand improvement, or the general condition of the woods don't hesitate to contact me. The best time to reach me is during the day on my cell phone 260-704-1655.

Sincerely,

Tom Crowe

Tom Crowe,
Crowe Forest Management, LLC