



Crowe Forest Management, LLC

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RAMSEY FOREST APPRAISAL AND MANAGEMENT PLAN **CLASSIFIED FOREST - 14.69 ACRES**

Classified Forest Program: This woodland is currently enrolled in the Indiana Department of Natural Resources – Division of Forestry’s Classified Forest Program. This is an excellent program that provides management assistance and a significant reduction in property taxes to the landowner. Harvesting of timber on this property must be approved by the Division of Forestry prior to sale and must follow Best Management Practices. The Division of Forestry has been contacted and the recommended harvest should be approved prior to the auction. If no harvest is desired, this approval does not require the recommended harvest to be conducted, however any variation in the harvest would need to be approved.

Location: The woodland is located in section 19 of Van Buren Township of LaGrange County, Indiana.

Watersheds: The woods are located along the Pigeon River which drains into the St. Joseph River which is in the Lake Michigan Watershed.

Objectives: The purpose of the appraisal is to evaluate the condition of the trees, appraise the timber and to develop forest management recommendations. The following recommendations are based on the objectives to maintain a healthy, financially 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 and Descriptions: According to the LaGrange County soil survey and on-site inspection the woods is composed of two soil types. Oshtemo loamy sand 0 to 2 percent slope and Oshtemo loamy sand 2 to 6 percent slope make up the higher ground. This soil is well drained and well suited for timber production. Sebewa loam is found along the river and is considered poorly drained but is well suited for timber production of water tolerant species.

Soil Productivity: The site index for Oshtemo loamy sand is 70 for white oak. The site index for the Sebewa loam is 88 for pin oak. 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.

APPRAISAL PROCESS

Timber Inventory: A 100 percent inventory of the recommended harvest was conducted in this woodland – the harvest trees are marked with blue paint. The residual stand was inventoried using the horizontal point sampling system (variable plot radius). Sample plots were systematically selected in order to obtain a random yet evenly distributed sampling of the woods. Trees were measured in one-inch DBH increments, considering all merchantable trees within the sample with a diameter at breast height of 12 inches or greater. A total of 12 plots were measured.

Efforts were made to adjust the volume of the timber to allow for defects in the trees. These adjustments are based on observable defects and holes, sounding the trunk of the trees, and evaluating the trees for excessive taper often due to hidden defects. Buyers are responsible for confirming the volume estimates.

The results of the inventory can be found in the tables found at the end of the report.

Valuation Process: To determine the 2011 fair market stumpage value for the merchantable timber in this woods, I used a combination of two different methods. A board foot value for individual species was used to convert the volume to value. These values were based on numerous discussions with buyers in the timber industry located in northeast Indiana and information obtained from other consulting foresters in Indiana. In addition the results from 10 comparable timber sales that I have conducted for private landowners in this marketing area were used to evaluate the values obtained using the direct pricing. Tree species, quality, and size, woodland size, location, and accessibility were factors considered when selecting comparable sales and determining a value per thousand board feet.

The variation in the values attributed to the residual timber and the harvest timber is due to the differences in the timber component of each portion, especially the hickory component. The recommended harvest is an improvement cut, therefore the relative value (\$/MBF) of the residual stand should increase after a harvest.

Appraisal Summary: Based on my knowledge of the recent timber sales and the timber inventory, I estimate that the 2011 stumpage value of the timber in the estimated 14.69 ± acre woodland to be as follows:

2011 ESTIMATED RESIDUAL TIMBER VALUE

2011 Estimated Sawtimber Board Foot Volume, DOYLE	113, 249 board feet
2011 Estimated Sawtimber Value per Thousand Board Feet	\$ 280/MBF
2011 Estimated Value of the Residual Timber	\$ 31,700

2011 ESTIMATED HARVEST TIMBER VALUE

2011 Estimated Sawtimber Board Foot Volume, DOYLE	43,110 board feet
2011 Estimated Sawtimber Value per Thousand Board Feet	\$ 260/MBF
2011 Estimated Value of the Recommended Harvest	\$ 11,200

2011 ESTIMATED TOTAL TIMBER VALUE *

2011 Estimated Value of the Residual Timber	\$ 31,700
2011 Estimated Value of the Recommended Harvest	\$ 11,200
2011 Estimated Total Timber Value	\$ 42,900

- The stumpage values were based on competitive bid sales and if sold this timber should be sold accordingly. We will complete the recommended sale for a minimal cost.

Timber Markets: Timber markets over last few years have been quite variable. Overall markets at this time are favorable for most species, especially relative to markets since the end of 2008. At this time markets for species present in this woodland are good for soft maple, white oak, and pallet material and down slightly for tulip, red oak, and black oak. Attention to the timber markets is important when selecting harvest trees. In general, if a desirable tree is improving it should be left, if it is declining it should be harvested, if it is border line, its impact on adjacent trees and the current markets can influence harvest decisions. The markets for lower grade or pallet material, although good at this time, have less of an impact on harvest decisions due to the opportunity cost of leaving the low value timber in the stand to compete with high value timber.

Additional information regarding timber prices and trend in Indiana can be found in Purdue FNR – 177 W – publication which is available on the internet through the Purdue extension website.

WOODLAND DESCRIPTION

Woodland Description: This is a very nice mixed hardwoods stand with four distinct areas. The terrain is gently rolling with some flat areas by the river. **Along the river** are two different areas depending on the topography. The west and central portion are dense stands of 16" to 26" DBH (diameter at breast height) soft maple. The basal area in this area is 120 to 160 square feet per acre. Basal area is a measure of stocking level. In general a stocking level of 80 to 110 is ideal. A higher basal area promotes height growth, however diameter growth is sacrificed, if too high the trees are stressed and more susceptible to pathogens. **In the southeast corner, on the higher ground,** there is an almost pure stand of 14" to 24" DBH white oak with a basal area ranging from 90 to 130 sq. ft. /acre. White oak is also abundant in the northwest portion of the woods. **In the northeast portion and along the higher ridges** is an oak-hickory stand consisting mainly of pignut and bitternut hickory, black and red oak, soft maple, and tulip with a few white ash, white oak, black walnut, basswood, and beech. The trees are generally 14" to 28" DBH and the stand is moderately well stocked to well stocked with a basal area ranging from 70 to 120 sq. ft./acre. **In between the river flats and the high sandy ridges** is a mixed hardwood stand dominated by yellow poplar, 16" to 30" DBH with a basal area ranging from 90 to 140 sq. ft./acre, but also containing white oak, red oak, black walnut, red maple, pignut hickory, basswood, shagbark hickory, bitternut hickory, and American beech.

A small amount of white ash is scattered throughout the woods but the majority was salvaged 3-5 years ago. The understory is fairly light and contains a little bit of desirable regeneration but is

mainly comprised of less desirable elm species, and hickories. Bladdernut is thick along the river. The quality is generally good to very good due to the high stocking level. The trees are generally in good condition except for the ash trees which are dead due to the infestation of Emerald ash borer.

The inventory included a combination of a 100 percent inventory of all trees that are recommended for harvest at this time and a point sample inventory of the timber that is not recommended for harvest. The combined inventory estimates 690 merchantable trees with an estimated volume of 156,359 board feet. There are 170 trees with an estimated volume of 43,110 board feet recommended for harvest at this time and approximately 520 trees with an estimated volume of 113,249 board feet remaining in the residual stand. The main species in the stand at this time are soft (primarily red) maple with (34 percent of the trees and 33 percent of the volume), tulip (21 % of the trees, 31 % of the volume) and pignut hickory (16 % of the trees, and 11 % of the volume). Other species represented in the inventory include red oak, white oak, black oak, bitternut hickory, white ash, basswood, sycamore, black walnut, beech, shagbark hickory, hackberry, American elm, cottonwood, and sassafras. **A complete inventory of the trees is provided at the end of the report.**

MANAGEMENT RECOMMENDATIONS

Timber Harvest: At this time a timber harvest is recommended. The objective of the harvest is to promote the long term health and productivity of the woods and to promote the regeneration of the oak species and tulip. The recommended harvest, marked with blue paint, includes 170 trees with an estimated volume of 43,110 board feet. In addition there are 32 trees marked with an "X" that contain little to no merchantable timber that should be removed in the harvest. If the "X" trees are not harvested they should be killed so that the space can be better utilized by future crop trees. **Income from the timber harvest should be approximately \$ 11,200 $\pm$ 10 percent based on the current markets and sold on a competitive bid basis.**

In general trees were selected for harvest based on their lack of potential to improve in the future or because they adversely affected the productivity of higher value future crop trees or desirable regeneration. This harvest concentrated on reducing the amount of slow growing and relatively low value hickory (66 trees), salvaging the dead ash (14 trees) and defective or damaged trees, thinning the dense stands of soft maple and tulip and releasing future crop trees from less desirable or poorly formed competition. In addition there are some mature to over mature soft maple, tulip, and red, black, and white oak that have reached their potential. Trees were harvested in such a way as to create the conditions to promote desirable natural regeneration. Additional trees could be harvested at this time, however it is not recommended. Additional harvesting could adversely impact the future productivity of the stand.

Timber Stand Improvement: After the sale timber stand improvement in the form of crop tree release, cull tree control, and completion of openings created in the harvest and understory treatment of undesirable species will be very important to the long term productivity of the woods. Grapevines will also be controlled as will any invasive species found during TSI operations. Crop tree release will select the best future crop trees and kill less desirable trees that are competing with them. This is done to improve the growth and vigor of the most valuable

trees. Examples include killing less desirable elm and hickory competing with the walnut, yellow poplar, oak, and maple. Most of the crop trees are large pole sized (8 to 12 inches, DBH). Crop trees are selected based on their species, quality, size and proximity to other future crop trees. The desired stocking level after harvest and TSI is 70 to 90 square feet per acre. Some of the large cull trees ("X" trees) that were included in the sale will probably not be harvested. These trees should be killed so that the space can be converted to more desirable species. Completion of openings is important to ensure undesirable species do not dominate the opening. Less desirable sapling sized trees that are competing with better trees should be killed to ensure the best trees survive. In addition the number of undesirable tree present in the stand should be reduced to reduce the future seed supply in order to enhance future natural regeneration. Approximately 20 square feet of basal area should be killed at this time in addition to the grapevines.

Future Recommendations: These 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. The next harvest should be in approximately 10 years, but the woods should be checked in 5 years to look for problems. The timing of the harvest will depend on your objectives and the condition of the trees in the woods.

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 will not damage a future crop tree. 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.

RECOMMENDED PRACTICE SCHEDULE

Timber Harvest (selective)	14.69 acres	2012
Periodic Intervals for activities		
Forest Stand Improvement	14.69 acres	Post Harvest
Re-inspection	14.69 acres	Every 5 years
Timber Harvest (selective)	14.69 acres	2021 to 2026
Forest Stand Improvement	14.69 acres	Post harvest

+ Forest stand improvement will remove an average of 20 square feet of basal area/acre.

Check the woodland edges for bush honeysuckle and treat accordingly (generally foliar—see below)

RECOMMENDED TIMBER HARVEST INVENTORY: October 2011

SPECIES	# TREES	EST. BOARD FEET DOYLE	"X" TREES
Soft maple	36	11430	7
Tulip	19	9891	1
Pignut hickory	54	9184	9
Red oak	10	4281	0
Black oak	13	2778	0
White ash	14	1840	7
Bitternut hickory	10	1802	2
White oak	5	602	1
Shagbark hickory	2	477	1
Beech	2	269	1
Hackberry	1	201	0
Basswood	1	137	1
American elm	2	113	1
Cottonwood	1	105	0
Sassafras	0	0	1
	170	43110	32

RESIDUAL TIMBER STAND INVENTORY: October 2011

SPECIES	# TREES	EST. BOARD FEET DOYLE
Red maple	198	40642
Tulip	126	37986
White oak	38	9299
Pignut hickory	53	8122
Red oak	27	6295
Black oak	21	4625
Sycamore	4	1294
Basswood	24	1390
Bitternut hickory	19	1688
Black walnut	5	1138
Beech	5	770
	520	113249