
Forest Management Plan

Linda Jean Hines

August 2019

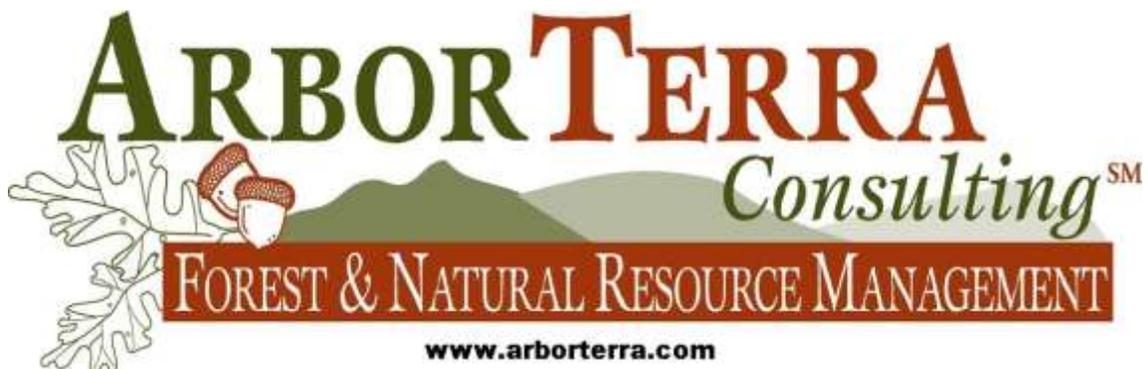


Table of Contents

- Cover Page 3
- Background and Site Information 4
 - Identification of Resource Concerns 4
 - Overall General Site Description 4
 - Past Use of Property 4
 - Water Resources 4
 - Prehistoric & Historic Features 4
 - Unique Animals, Plants & Habitat 5
 - Wildlife Resources 5
 - Exotic and Invasive Species Concerns 5
 - Regional Conservation Concerns 5
 - Property Access and Forest Roads & Trails 5
 - Boundary Marking 5
 - Topography and Soils 6
- Client Management Objectives 6
- Stand Description 6
 - Stand 1a 6
 - Stand 1b 6
 - Stand 1c 7
- Desired Future Condition 7
 - Activities to Achieve Desired Future Conditions 7
- Management Activity Tracking Log 9
- Job Sheet - Forest Stand Improvement (666) 10
- Job Sheet - Brush Management (314) 11
- Maps 18
- Appendix 22

Cover Page

Landowner Name: Linda Jean Hines (Richard Hines)
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Brookston, Indiana 47923
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Certified Forester #1269
TSP #03-2752

Location: Farm 5416, Tract 14534; Part of Section 20, T25 N, R3W, Prairie Township,
White County, Indiana

Total Forested Acres in Plan: 33.19 acres

Date Plan Prepared: 12-15-2017

Date Plan Updated: August 1, 2019

Acknowledgements:

I have reviewed the attached Forest Management Plan dated 8-1-2019 and agree with its recommendations for reaching my management objectives. I agree to follow this plan as written, unless circumstances arise that amendments need to be made to meet ownership and program objectives. The administrating Forester must agree upon the plan amendments. This plan meets the management plan requirements for the Natural Resources Conservation Service (NRCS) Conservation Activity Plan, the Indiana Classified Forest & Wildlands Program, and the Tree Farm program.

Landowner's Signature: _____ Date: _____

TSP Signature: _____ Date: _____

NRCS Signature: _____ Date: _____

Background and Site Information

Identification of Resource Concerns

Resource concerns on this property are:

- Degrading Plant Conditions - brought on by the presence of invasive species observed and by the absence of natural oak and other desirable regeneration in the understory.
- Soil Erosion - brought on by the presence of invasive species observed.
- Water Quality Degradation - brought on by the presence of invasive species observed, and the absence of natural oak and other desirable regeneration in the understory.
- Inadequate Fish and Wildlife habitat - brought on by the presence of invasive species observed and by the absence of natural oak and other desirable regeneration in the understory.

Overall General Site Description

The property consists of 33.19 total acres of forestland and is fully stocked to slight overstocked with quality trees that will benefit from good management. It is broken into 3 stands. Stand 1a (6.00 acres) is a mature upland stand of saw log size Red oak, White oak, Black walnut, Sugar maple, Hackberry, Black cherry, Black locust and Sycamore, Tulip poplar and Ash. Stand 1b (25.5 acres) is a mostly pole size to small saw log size bottomland stand of Silver maple, Black walnut, Sycamore, Sugar maple, Cottonwood, Chinkapin oak, and Red oak. Stand 1c (1 acre) is a pole size stand of Black walnut trees that were planted on an 8'x10' spacing. Soil types represented include Abscota loamy fine sand, Cohoctah fine sandy loam, and Martinsville silt loam. Cohoctah is very poorly drained while Abscota is moderately well drained and Martinsville is well drained. The Tippecanoe river flows along the east side of the property.

Past Use of Property

Livestock and fire have impacted these forested acres in the past. The bottom land area along the Tippecanoe River was once farmed. This area has recently re-grown into a forest cover of mostly Silver maple, Cottonwood, and Sycamore. These forested acres have had limited forest management in the past. Extensive work on controlling invasive plants began in 2015 and continues today. A system of access trails was established in 2015/2016. Most recently a sugar camp has been established to produce syrup from the Sugar maple and Black walnut trees on this property.

Water Resources

Woodlands and other natural areas are extremely effective at filtering pollutants and minimizing erosion as water moves across the landscape. You can maintain this effectiveness by following basic Best Management Practices (BMPs) when using any type of heavy equipment in your natural areas. BMPs are especially important during timber harvesting operations. For more information on BMPs contact ArborTerra Consulting Inc. www.arborterra.com. The Tippecanoe River flows along the east side of this property. There is also a one-half acre pond/wetland area located in the middle of this property.

Prehistoric & Historic Features

None were identified during the inspection. Most land parcels within the State of Indiana may be environmentally suitable to contain archaeological deposits but have not been investigated in order to verify the presence or absence of cultural deposits. Indiana Code 14-21-1 provides protection to archaeological sites and cemeteries on both private and public land by prohibiting digging anywhere with the intent to recover artifacts and disturbing the ground within 100 ft. of a cemetery without an approved plan from the IDNR – Division of Historic Preservation and Archaeology. In addition, if

archaeological artifacts (an object made or modified prior to 1870), features (non-portable evidence of human occupations, such as a well), or human remains are uncovered during ground disturbing activities, state law requires that the discovery must be reported to the Department of Natural Resources within two (2) business days. Landowners who need to report archaeological sites or who are interested in learning more about cultural sites should contact the Division of Historic Preservation and Archaeology at 402 W. Washington St., Rm. W274, Indianapolis, IN 46204, 317-232-1646, dhpa@dnr.in.gov, or at <http://www.in.gov/dnr/historic/index.htm>.

Unique Animals, Plants & Habitat

During our visits to the site, no registered threatened or endangered species were observed. However, this does not eliminate the possibility of species of concern existing on your property. The DNR Natural Heritage Data Center is a program designed to track Indiana's special plants, animals, and natural communities. Often, features on private lands, in particular, are missing from the database. You can find more information on this subject at the Division of Nature Preserves' website: <https://www.in.gov/dnr/naturepreserve/>.

There are some trees that might be suitable for the Indiana bat on the property. Protocols that will not disturb the Indiana bat during its active flight season will be implemented. See attachment.

Wildlife Resources

Bald eagles, Beaver, Wild turkey, deer, squirrel, rabbit, coyotes and a variety of songbirds and woodpeckers are found on the property. Many landowner activities can change and improve the quality of habitat. Activities include harvests, thinning of woodlands, mowing, burning, or planting of food plots and native warm season grasses.

Exotic and Invasive Species Concerns

Invasive species requiring attention that have been found on the property are Asian bush honeysuckle, Autumn olive and Multiflora rose. Phragmites can also be found around the small pond in the center of the property. These species are becoming more prevalent and should be eradicated whenever they are encountered.

Regional Conservation Concerns

Forest fragmentation, loss of oaks, death of ash from the emerald ash borer, and the advancement of invasive species continue to be problems in this area of the state. As building sites and development expand into this area the concern over fragmentation will continue. Without proper management the oak component has begun to drop out of forests, decreasing forest diversity as well as removing essential shelter and food sources for a variety of wildlife species. Loss of ash trees from emerald ash borer is increasing in intensity across Indiana. Most of the ash trees on this property are dead or dying. Controlling invasive species including Asian bush honeysuckle, Autumn olive and Multiflora rose is extremely important to improving and maintaining the health of your forested lands.

Property Access and Forest Roads & Trails

This property can be accessed from Springboro road via the driveway or by SR 18 via a gravel lane. There is a well-established network of ATV trails throughout the property. These access routes are in need of annual maintenance.

Boundary Marking

See attached map for location of present property boundary lines. The boundary lines are well marked and follow some old intermittent fencing, Springboro road, SR 18 and the Tippecanoe River.

Topography and Soils

Reference to the White County Soil Survey. The soils found on this property are considered highly adapted for woodland land uses. Most of this property is flat bottomland along the Tippecanoe River. The western side of this property is a high ridge overlooking the river bottom.

Stand 1a major soil is Abscota loamy fine sand, occasionally flooded (Ab) and the minor soil is Martinsville silt loam (MaB2, 2-8% slopes, eroded). Not site indexes are available for the Abscota soils. The Martinsville site index is 98 for Tulip and 80 for White oak.

Stand 1b major soil is Cohoctah fine sandy loam, occasionally flooded (Ck) and the minor soil is Abscota loamy fine sand, occasionally flooded (Ab). The site indexes for Cohoctah include 95 for Silver maple, 72 for Red maple, and 70 for Green ash.

Stand 1c major soil is Abscota loamy fine sand, occasionally flooded (Ab). No site index is available for this soil.

Most of these soils are generally found on moderate slopes to no slopes. The main productivity limitation is the soils are subject to erosion when laid bare. With good management they all can produce high quality hardwood timber. Major limitations are associated with erosion and flooding concerns that can be mitigated by using Best management Practices (BMPs).

Client Management Objectives

To manage and improve their forest land resource for the production of maple syrup, wood products, wildlife benefits, recreation opportunities, and for the protection and enhancement of the soil, water, plant, and aesthetic resources on the property. Also, to maintain a strong component of oak, walnut and other high value timber species within the forest stands.

Stand Description

The forest property consists of three stands. A delineation of these stands is included.

Stand 1a

6.00 acres – a mature upland stand of saw log size Red oak, White oak, Black walnut, Sugar maple, Hackberry, Black cherry, Black locust and Sycamore, Tulip poplar and Ash. It is slightly overstocked (95%) with 80 ft² basal area/acre and an average diameter of 16 inches. Grapevines are present at 20 vines per acre. The understory is composed of Spicebush, Buckeye, Sugar maple, and Multiflora rose. There is very little oak regeneration. Habitat type is upland hardwoods (for site index see attached Forest Productivity Report). There are trails throughout this stand.

Stand 1b

25.5 acres - a mostly pole size to small saw log size bottomland stand of Silver maple, Black walnut, Sycamore, Sugar maple, Cottonwood, Chinkapin oak, and Red oak. It is slightly overstocked (95%) with 110 ft² basal area/acre and an average diameter of 8 inches. The understory is mostly Spicebush, Multiflora rose, and Sassafras. It has a very small amount of oak regeneration. Grapevines are present at 30 vines per acre. Habitat type is bottomland hardwoods (for site index see attached Forest Productivity Report). There are trails throughout this stand.

Stand 1c

1 acre -- is a pole size stand of Black walnut trees that were planted on an 8'x10' spacing. The average diameter is 8". These trees have been pruned periodically. This stand is slightly overstocked and should be thinned to 300 trees. (Remove 50 trees). There are trails throughout this stand.

Desired Future Condition

The desired future condition is a well-managed and vigorous growing stand of mixed hardwood trees favoring the Sugar maple and Black walnut trees for syrup production and including practices that will promote a strong component of oak. This desired condition includes a diverse habitat suitable for the promotion of a large variety of fish and wildlife. This desired condition does not include excessive grape vines or invasive species in the stands. This future condition is also financially sustainable from income generated from this property.

Activities to Achieve Desired Future Conditions

Developing and following a written management/stewardship plan is paramount to achieving a desired future condition. This plan should be reviewed annually and adjusted as needed. As always Best Management Practices (BMPs) are necessary to use during any harvest or land disturbing activities.

Invasive species management (**Brush Management 314**) should be done in all stands. Invasive species found in need of control are Asian bush honeysuckle, Multiflora rose and Autumn olive. All invasives will be treated with a cut stump or basal stem method using Garlon 4 or equivalent and/or foliar applications of Glyphosate. This should be done using successive treatments over a three-year span. Current infestation is considered high in Stand 1b and low in stands 1a and 1c. Post treatment level is expected to be less than 5% in the stand.

Pre harvest and or post-harvest TSI (**Forest Stand Improvement 666**) should be planned with any timber sales to deaden cull trees, eliminate grape vines from the stand, do mid story removal under seed producing oak trees, to eliminate the invasive species found in the woodland area, and release and promote Sugar maple, and Black walnut crop trees. This practice prepares the woods for growing the next generation of trees and improves species quality and species composition. Improvement work will require the removal of 10 to 15 square feet of basal area per acre and all grape vines.

As young forest stands mature periodic pruning, thinning (**Tree and Shrub Pruning 660**) and/or periodic (Timber Harvest) are appropriate to promote good tree quality and favorable species composition in the woods. This practice contributes to faster growth, better tree quality, and greater economic returns.

Where natural regeneration of favorable species is not achievable, planting favorable tree species is recommended (**Tree and Shrub Establishment 612**). These plantings can be made in openings created during harvest operations or in open crop or grassland fields. Introduction of Red and White oak species is recommended as they are the most difficult to regenerate naturally.

Access trails will be established (**Forest Trails and Landings 655**) and will receive annual maintenance. Water diversions on these trails are needed on the steeper slopes to control the gully erosion. Maintaining these trails adds value to your timber resource by providing access during management and harvest operations. They also provide feeding nesting and travel ways for many wildlife species.

High grading (the removal of the highest-grade timber, leaving only lower quality, less desirable trees) is not a valid management option. Diameter limit harvest is also not a valid management option except in very limited cases. Diameter limit harvests will not be used in your forest stand unless it is recommended in this plan.

It is highly recommended to use a professional forester and qualified logger when undertaking a timber sale and harvest. Timber harvest is best done after grape vines and invasive species have been controlled.

You must call your Consulting Forester before you begin planning your timber sale in order to meet the requirements for selling certified wood. It is also important for you to meet with your Consulting Forester before any timber sale to discuss important details for your harvest including any BMP issues that may need to be addressed, and any environmentally sensitive areas that may need to be avoided.

In the case of storm, fire, pest outbreak, or other widespread damage, consult with your forester to adjust management activities and recommendations to put the property back on track to meet your goals.

Arbor Terra Consulting has the capability to address all of the concerns and opportunities mentioned above by developing the necessary plans and following through with the implementation as well.

This plan offers general guidelines to manage your natural resources and some recommended or required action(s) is (are) needed. The use of a professional forester is necessary as you undertake significant or unfamiliar land management actions. This is especially true with timber resources, where missteps can have consequences lasting for decades. Contact your Consulting Forester at mwarner@arborterra.com; www.arborterra.com; Phone 317-796-7154.

As a forest landowner, you may also be interested in additional resources including the Indiana Woodland Steward Institute which publishes a free newsletter three times a year to landowners. To view past issues and sign up please visit <http://www.inwoodlands.org/>. Another resource for landowners is the Tree Farm Program. Visit www.treefarmssystem.org/indiana.

Management Activity Tracking Log

SCHEDULED YEAR	AREA NAME or NUMBER	ACTIVITY DESCRIPTION	ACRES	PRIORITY	DATE COMPLETED	ACRES COMPLETED	EQIP	COMMENTS
2018	All stands	Brush Management (314)	32.5	High	Foliar spray completed in 2019, 2020, 2021, 2022	32.5	Yes (3 yrs only); ongoing maintenance	Asian bush honeysuckle, Autumn olive and Multiflora rose. Phragmites around pond.
2018	Stands 1a and 1b	Forest Stand Improvement Light (666)	31.5	High	April 2019	31.5	Yes	Remove 10-15 sq.ft.BA/ac. Remove all vines Crop tree release Midstory removal under seed producing Oaks
2017	All Stands	Timber inventory and Forest management Plan	33.19	High	Dec 2017	33.19		COMPLETE
2025 & beyond	All Stands	Timber harvest	31.5	Low				
2018	All Stands	<i>Forest Trails and Landings (655)</i>	2,337 ft.	High	Maintenance ongoing		No	Maintain
2018	All Stands	Forestry BMPs	33.19	High	Maintenance ongoing		No	
2023	See map	Container Tree planting	5.0	High			CSP	

2023+	All Stands	Forest songbird habitat maintenance	33.2	High			CSP	
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Forest Management Plan Addendum

Name: Richard (Linda) Hines

Date: December 1, 2022

From: ArborTerra Consulting, Inc., TSP #03-2752

Add following practice to Plan:

2025 - E666R – Forest Songbird Habitat Maintenance (33.2 acres)

Need:

To preserve habitat features following a forest stand improvement treatment designed to create habitat for a suite of forest-dwelling neotropical migratory songbirds.

Resource concern:

To protect investments in habitat creation by providing for follow-up activities including tending forest habitat and monitoring bird populations.

Forest Stand Improvement was completed across 31 acres in 2019 and included removing vines and releasing crop trees such as oaks.

Brush Management has been implemented across the property for the past 3 years. This needs to be monitored and maintained as new invasive plants come onto the property.

Tree planting will occur in 2022/2023 over 5.0 acres to increase diversity of tree species on the property.

See map below

Forest Management Plan Addendum

Name: Richard (Linda) Hines

Date: November 15, 2022

From: ArborTerra Consulting, Inc., TSP #03-2752

Add following practice to Plan:

2023+ - E612C - Establishing tree/shrub species to restore native plant communities; Conservation Practice 612: Tree/Shrub Establishment

Need: Establish trees and/or shrubs to restore elements of plant diversity that have been lost through past diseases or improper management.

Resource concern: Ash have died out in the stands; oak/hickory component is little in stands. Promote diversity for wildlife habitat and food sources.

- 5.0 acres

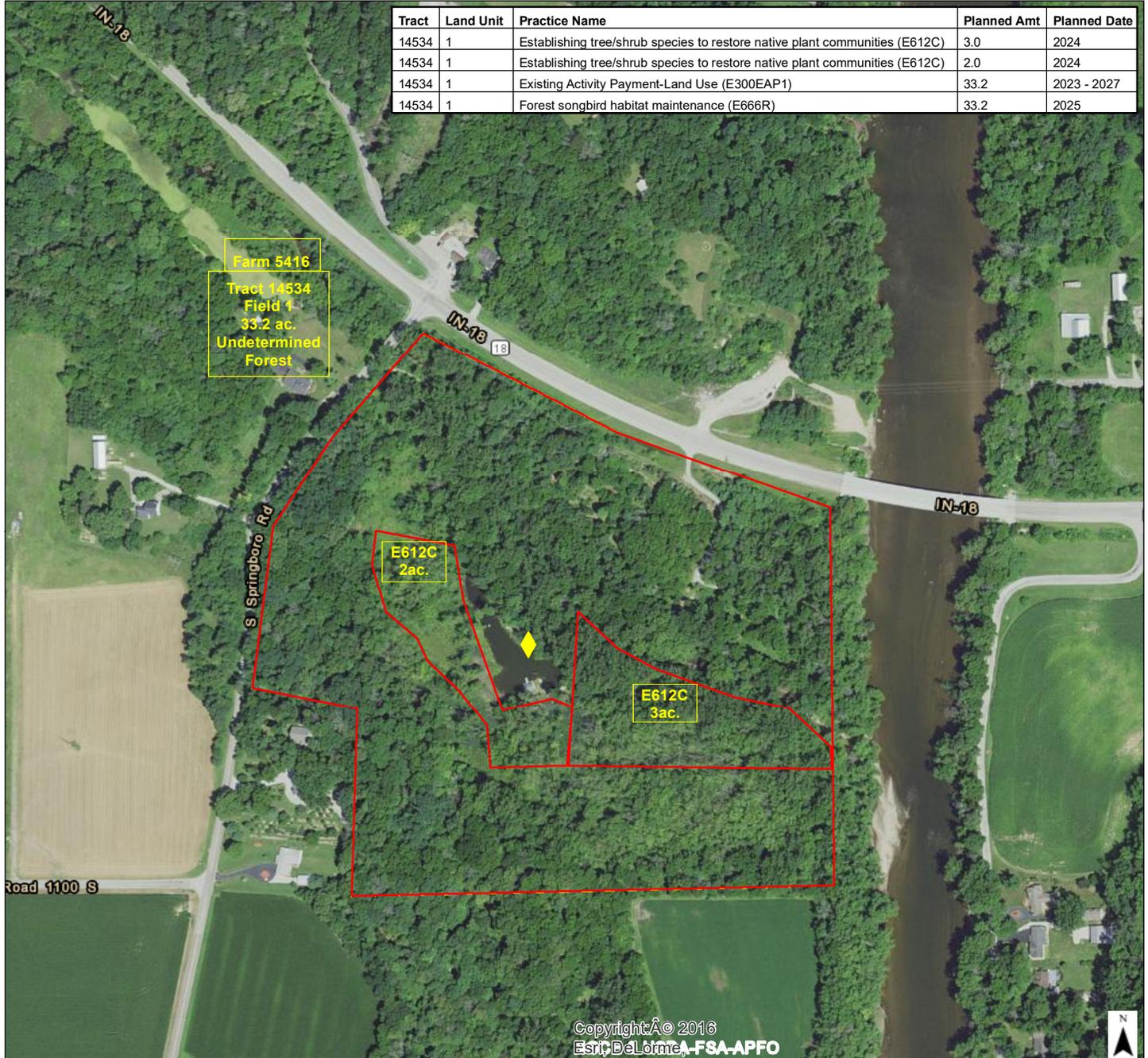
See map below

Conservation Plan Map

Client(s): LINDA JEAN HINES
White County, Indiana

Assisted By: SARA SCHELLENBERGER-JONES
USDA-NRCS
MONTICELLO SERVICE CENTER
WHITE COUNTY SOIL & WATER CONSERVATION DISTRICT

Prepared with assistance from USDA-Natural Resources Conservation Service



Conservation Practice Points

◆ <all other values>

Conservation Practice Polygons

▭ <all other values>

▭ Practice Schedule PLUs

CSP 2023:

- Establish tree/shrub species to restore native plant communities (E612C) 2024-5ac.
- Forest songbird habitat maintenance (E66R) 2025-33.2ac.

CSP2018:

- Forest Stand Improvement (666) 2018-1ac.
- E666133X (Forest Stand Improvement) 2018-10.5ac, 2019-10.5ac, 2020-10.5ac

EQIP 2017:

- CAP106 Management Plan 33.2ac

EQIP 2014:

- Brush Management (314) 33.0ac. 2015, 2016, 2017
- Trails and Landings (655) 0.5ac 2015, 2016





Job Sheet - Forest Stand Improvement (666)

Linda Jean Hines 5416 14534 1a and 1b 31.5
 Property/Landowner Farm Number Tract Number Field Number Acres to be treated

Purpose (Check all that apply)	
<input checked="" type="checkbox"/> Increase quantity and quality of forest products	<input type="checkbox"/> Harvest forest products
<input checked="" type="checkbox"/> Initiate forest stand regeneration	<input type="checkbox"/> Reduce potential damage from pests and water stress
<input type="checkbox"/> Restore natural plant communities	<input checked="" type="checkbox"/> Achieve a desired understory plant community
<input type="checkbox"/> Improve aesthetics, recreation, and open space	<input checked="" type="checkbox"/> Improve wildlife habitat
<input checked="" type="checkbox"/> Improve water utilization and conservation	<input checked="" type="checkbox"/> Achieve a desired level of crop tree stocking and density
<input type="checkbox"/> Increase carbon sequestration	<input checked="" type="checkbox"/> Promote oak regeneration
<input checked="" type="checkbox"/> Remove damaged or dying trees	<input type="checkbox"/> Other:

Stand Condition

Crop Trees (Species): All oak species, Black walnut, Hickory, Black cherry

Species for Removal: American beech, Sugar maple, Sassafras

Stand Basal Area per Acre (ba/a): Stand 1a current: 80 ft²/a; Post-treatment target: 70 ft²/a;
 Stand 1b current: 110; Post-treatment target: 95 ft²/a; Vines per acre in Stand 1a: 20; Stand 1b: 30

Treatment Methods

Herbicide: Y/N

If yes which herbicide(s): 50% Glyphosate/water

Treatment Method (Check all that apply)
<input checked="" type="checkbox"/> Cut Stump
<input type="checkbox"/> Basal Stem
<input checked="" type="checkbox"/> Single Girdle (with herbicide)
<input checked="" type="checkbox"/> Double Girdle (without herbicide)

Practice Specifications

Remove 10-15 sq.ft.BA/ac.-----Remove all vines -----Crop tree release -----Midstory removal under seed producing Oaks

EQIP Job Sheet:

Job Sheet - Brush Management (314)

Indiana - May 2014 (ver. 1.0)

Invasive Species Management Plan

Landowner: Linda Jean Hines			County: White	
Farm: 5416	Tract: 14534	Stand(s): All stands	Acres: 32.5	Date: 8/1/2019
Assisted by: Mike Warner, ArborTerra forester				

Species to be Controlled and Methods			
Treatment will begin in Year 2019 and end in Year 2021			
SPECIES	CONTROL METHODS (also see the attached documents)	SPECIES	CONTROL METHODS (also see the attached documents)
<input checked="" type="checkbox"/> Autumn olive, Multiflora rose, Asian bush honeysuckle	All invasive will be treated with a cut stump or basal stem method using Garlon 4 or equivalent and with foliar treatments using Glysohate	<input type="checkbox"/> Ailanthus	
<input type="checkbox"/>		<input type="checkbox"/>	
NOTES: Treatment should be applied over 3 successive years to obtain optimal result. 95% eradication is the desired result.			

Control Area and Location of Sensitive Resources

See attached map (NOTE the locations of sensitive resources and setbacks) see Arbor Terra CAP Plan. Avoid using Garlon product within 50 feet of bodies of water.

Avoid impacts to the following species in the vicinity of the invasive species to be controlled:
see Arbor Terra CAP Plan. Any crop trees including Oaks, Tulip poplar, Black walnut, Sugar maple

NOTES:

Post Treatment Activities

Natural regeneration of preferred species will re-colonize the site. see Arbor Terra CAP

Preferred species to regenerate are oak/hickory and walnut.

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Operation and Maintenance

Check the site annually and spot treat any undesired re-growth.

NOTES:

LOCATION OF SENSITIVE RESOURCES

When using chemical control methods, care should be taken to not directly spray the sensitive area, and contamination resulting from spray drift should be eliminated as much as possible.

It is the landowner's responsibility to follow chemical labels and required setbacks.

Mechanical methods only may be required near streams, wetlands, and other waterbodies. Give consideration to erosion concerns. Do not dig out root systems or destabilize stream banks without implementing an erosion control plan.

BENEFICIAL PLANTS TO BE AVOIDED

Care should be taken to limit the impact on non-target species. Avoid using broadcast spraying methods when a large number of non-target species are present. Desirable plants (including large, established trees) are susceptible to chemical stress or mortality due to drift, root transfer, or direct spraying of chemical treatment.

Be sure to carefully identify target species prior to using any control method.

Use the identification sheets listed, or contact a trained professional if unsure.

CONTROL METHODS

Consult a licensed herbicide applicator before applying herbicides over large areas, or when using restricted-use herbicides.

Dormant season treatment of woody stems is used often because it reduces damage to non-target species. By both cutting and applying herbicide directly to the target species, more effective control can be obtained. Cutting without any additional treatment will not kill the plant, and will result in stump and root sprouting. Stems should be cut near the ground, and herbicide or herbicide mixture applied directly to the cut portion of the stem. Application of chemicals should occur shortly after the stump is cut to maximize effectiveness. This type of treatment reduces the amount of needed herbicide.

Treatment of target species may also be done in early spring or late fall, when the targeted species are still actively growing, but native species remain dormant.

When a large number of native species are present, hand-pulling small seedlings, as long as the roots do not break off in the soil, is also an effective way of eliminating plants.

It is recommended that all targeted species be controlled in a small selected area before moving elsewhere in the treatment area. When treatment is scattered over the entire affected area, it can be difficult to prevent the quick spreading of remaining plants. By concentrating treatment in small patches, it is easier to eliminate all plants in an infected area. See attached information sheets for more information on specific species control methods.

CHEMICAL REGULATIONS

All chemicals used in the treatment of invasive species will be applied according to the manufacturer's label and applicable state laws. It is the participant's responsibility to follow the applicable regulations and instructions on correct application, setbacks, protection of environmentally sensitive areas, buffers, etc. Contact a Licensed Commercial Pesticide Applicator or dealer with questions regarding mixtures, application, regulations, and disposal methods.

The participant is responsible for obtaining a private applicator permit in his/her name as required for the application of restricted-use pesticides on the area of treatment. Alternatively, a Licensed Commercial Pesticide Applicator may be used to make such applications. NRCS is not responsible for necessary permits or any negligent use of applied chemicals.

PLANT DISPOSAL & EROSION CONTROL

Large stems may be removed from the treatment area to allow room for re-growth of native species. These stems can be mulched, composted, or disposed of in other methods according to local ordinances. Smaller stems can be left in place. If there are large numbers of fruit remaining on the stems, destructive methods such as mulching should be considered to limit the spreading of additional seed. If few berries are present, consider using cut stems to provide brush piles for wildlife habitat along field edges.

LIABILITY

The participant takes sole responsibility for compliance with federal, state and local laws and regulations regarding the use of the above control methods. The participant is also responsible for following all NRCS policies during the application of the above control methods and the period of enrollment in NRCS assistance programs.

MONITORING

Continuous monitoring will be required after this site has been treated for the target species. The target species seed bank may be extensive and it is likely that new plants will develop. There is also a substantial risk that seeds will be deposited in the treated area by wildlife from outside sources.

OPERATION AND MAINTENANCE

After initial treatment, regular maintenance may be necessary. Scouting should occur every spring, immediately after bud break, when the target species are most obvious, and the native species have not yet broken dormancy. Any re-growth, new infestations, or missed plants should be treated. Once the initial treatment period has passed, any follow-up maintenance should be limited in scale, and include only spot treatment. All aforementioned rules, regulations, policies, and guidelines apply to the follow-up treatment.

References

Invasive.org: Source for information and images of invasive & exotic species (includes information on bio-control agents) <http://www.invasive.org/>

2014 Weed Control Guide for Ohio and Indiana (Bulletin 789/Pub# WS16): Includes section on weed control in *Permanent Grass Pastures/CRP/Grass Hay* (page 143).
<http://www.btny.purdue.edu/Pubs/WS/WS-16/>

Barberry, Japanese: PCA Alien Plant Working Group Fact Sheet
<http://www.nps.gov/plants/alien/fact/beth1.htm>

Bittersweet, Oriental: IPSAWG Fact Sheet
http://www.in.gov/dnr/files/Oriental_Bittersweet.pdf

Buckthorn, Glossy: IPSAWG Fact Sheet
http://www.in.gov/dnr/files/glossy_buckthorn_factsheet.pdf

Burning Bush: USDA Forest Service
<http://www.invasive.org/eastern/srs/WBB.html>

Corktree, Amur: USFS Weed of the Week
http://www.na.fs.fed.us/fhp/invasive_plants/weeds/amur-corktree.pdf

Elm, Siberian: USFS Weed of the Week
http://www.na.fs.fed.us/fhp/invasive_plants/weeds/siberian-elm.pdf

Honeysuckle, Asian Bush: IPSAWG Fact Sheet
http://www.in.gov/dnr/files/Bush_Honeysuckle.pdf

Honeysuckle, Japanese: IPSAWG Fact Sheet
http://www.in.gov/dnr/files/Japanese_Honeysuckle.pdf

Kudzu in Indiana Purdue Extension (WS-30-W)
<http://www.btny.purdue.edu/weedscience/2004/articles/Kudzu3-8-04.pdf>

Lespedeza, Sericea: USDA Forest Service
<http://www.invasive.org/eastern/srs/CL.html>

Olive, Autumn: IPSAWG Fact Sheet
http://www.in.gov/dnr/files/Autumn_Olive.pdf

Princess Tree (Paulownia): USDA Forest Service
http://www.invasive.org/eastern/srs/P_RP.html

Pear, Callary: USDA Forest Service

http://www.invasive.org/eastern/srs/P_RP.html

Periwinkle, Common: USFS Weed of the Week
http://www.na.fs.fed.us/fhp/invasive_plants/weeds/common-periwinkle.pdf

Rose, Multiflora: Invasive.org
<http://www.invasive.org/browse/subject.cfm?sub=3071>

Rose, Multiflora: USFS Weed of the Week
http://www.na.fs.fed.us/fhp/invasive_plants/weeds/multiflora-rose.pdf

Stiltgrass, Japanese: USFS Weed of the Week
http://www.na.fs.fed.us/fhp/invasive_plants/weeds/japanese_stiltweed.pdf

Tree of Heaven (Ailanthus): PCA Alien Plant Working Group Fact Sheet

*** Warning: Parts of this plant are dangerous to humans. Use caution when managing this plant.*

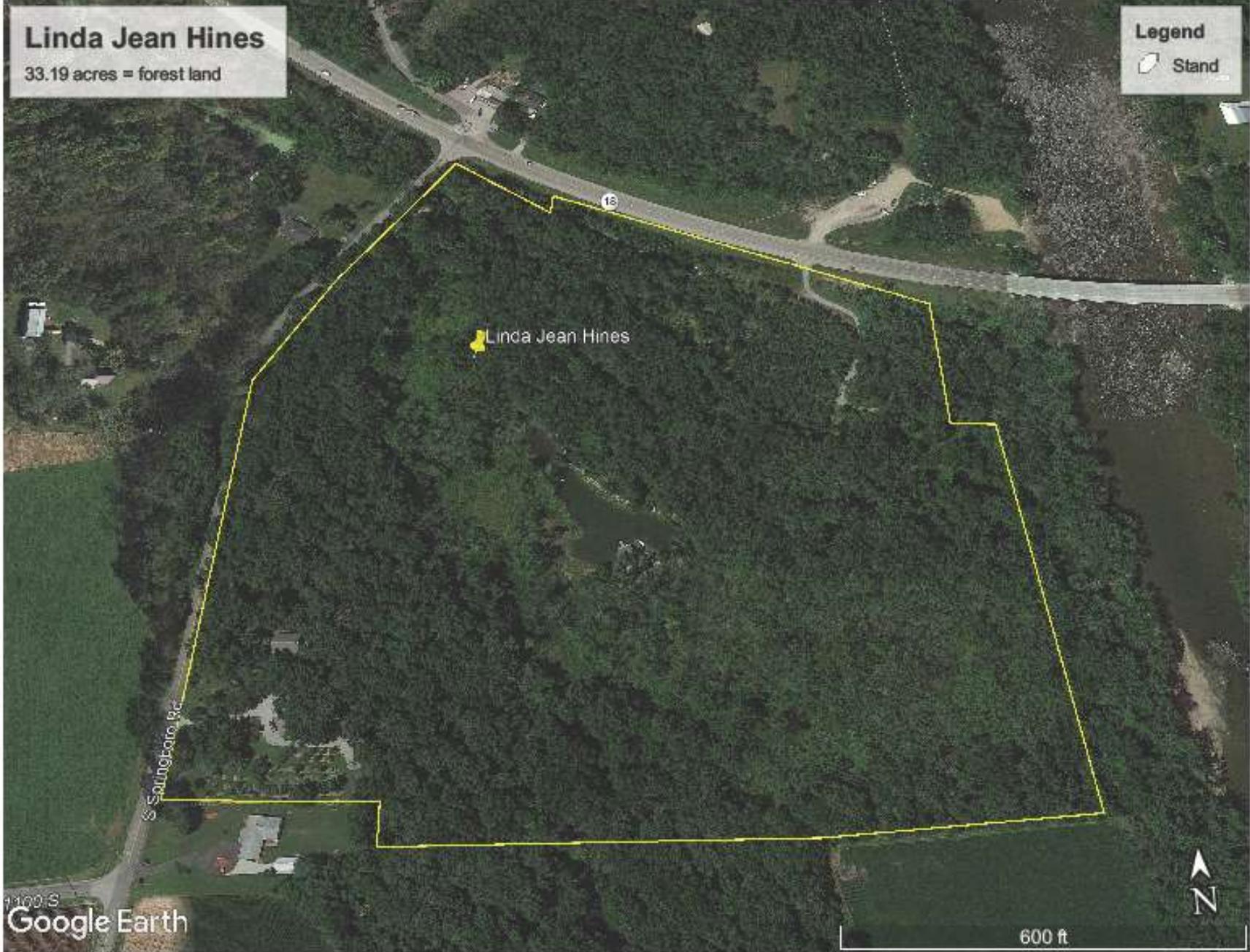
Note: • Use of basal bark application highly recommended (see page 3).
<http://www.nps.gov/plants/alien/fact/pdf/aial1.pdf>

- See the guidance for the Indiana Bat in Section II of the IN NRCS FOTG for additional restrictions on trees >three (3) inches in diameter.

Helping People Help the Land.



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Linda Jean Hines

33.19 acres = forest land

Legend

Stand

Linda Jean Hines

Google Earth

600 ft



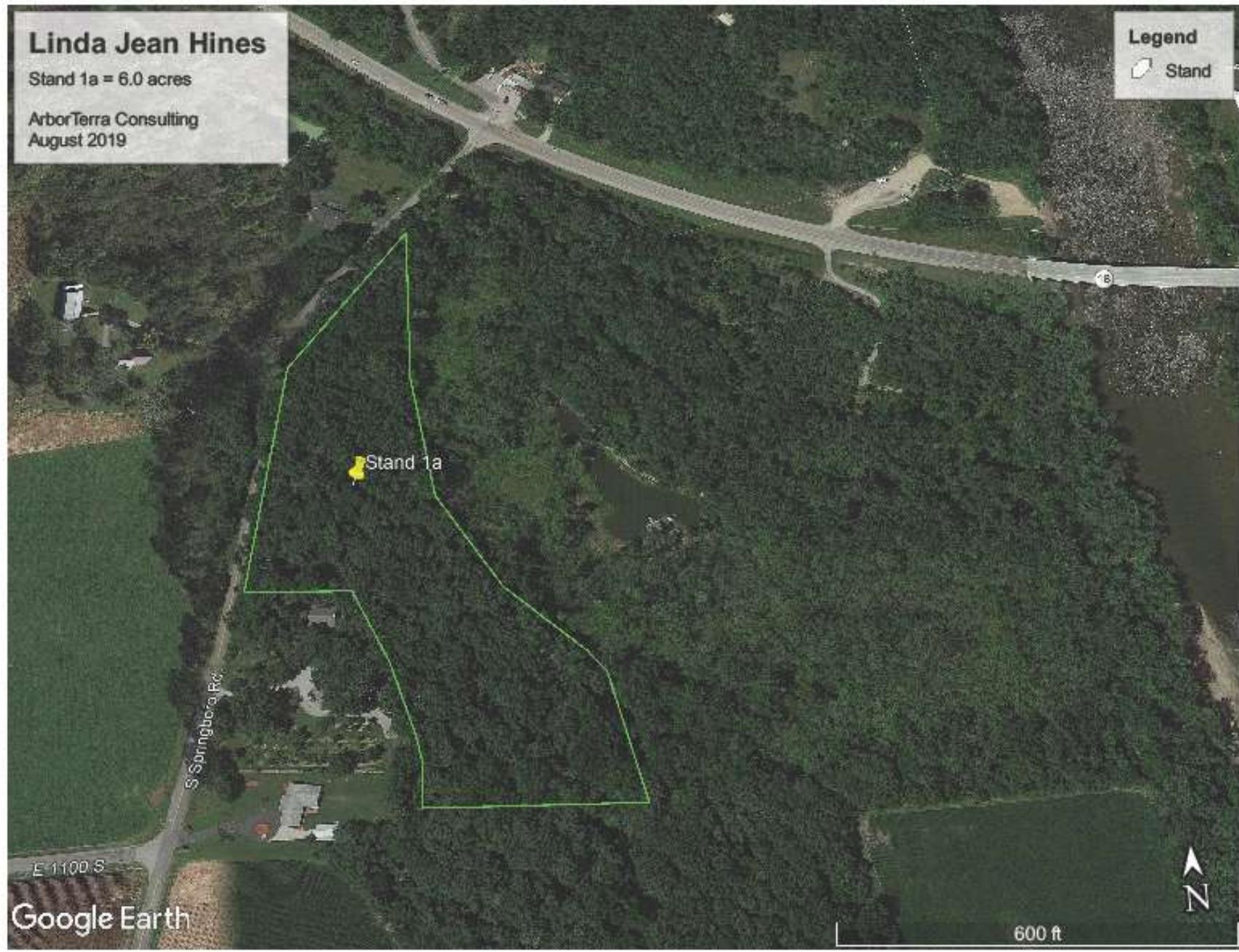
Linda Jean Hines

Stand 1a = 6.0 acres

ArborTerra Consulting
August 2019

Legend

 Stand



Linda Jean Hines

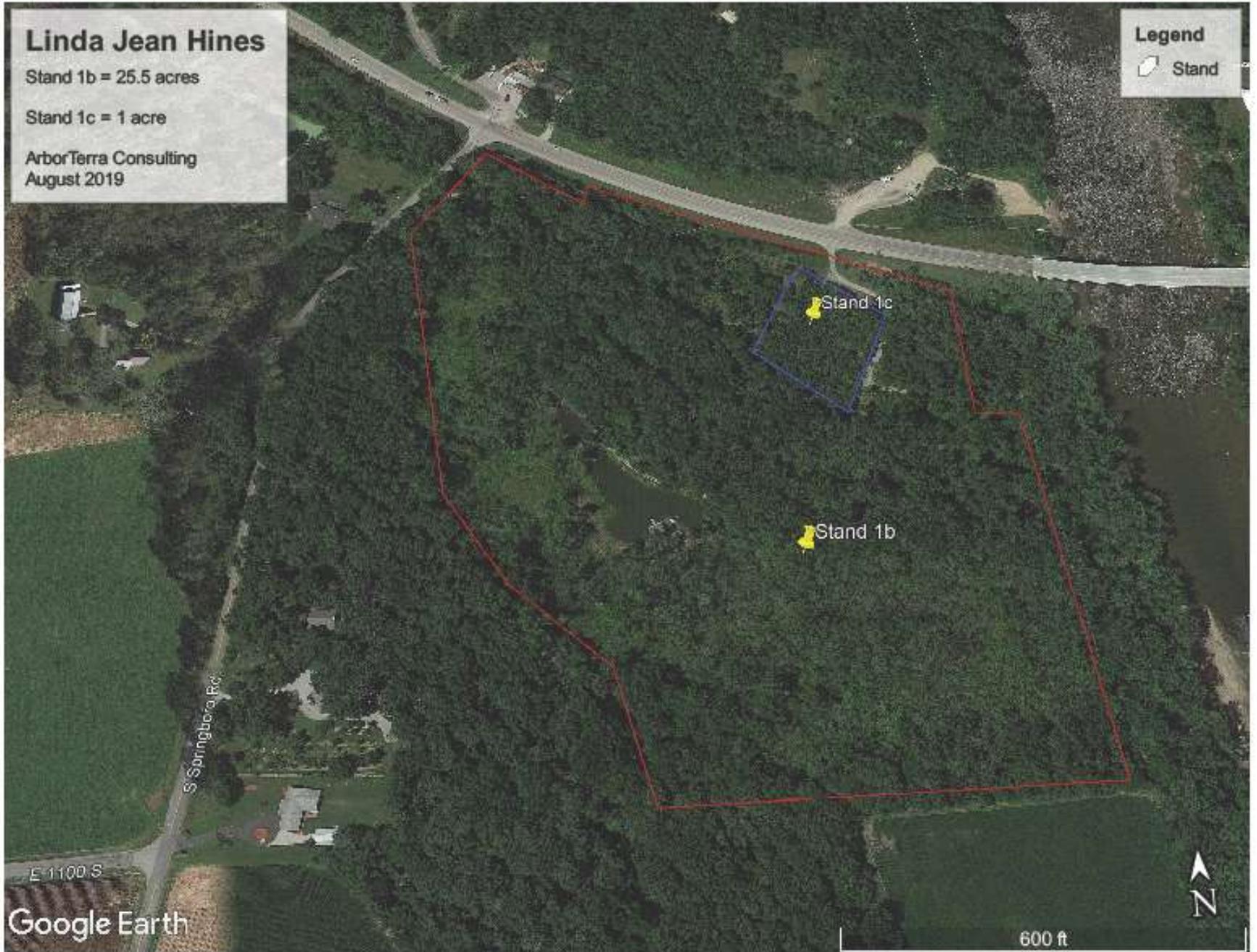
Stand 1b = 25.5 acres

Stand 1c = 1 acre

ArborTerra Consulting
August 2019

Legend

 Stand



Appendix

Terms and Definitions

Deer Browse Management

Gingrich Stocking Table

Topography Map

Soils Report

Indiana Bat fact sheet

Terms and Definitions

Basal area - The cross-sectional area at 4.5 feet off the ground.

Best Management Practice (BMP) - Acceptable practices that can be implemented to protect water quality and promote soil conservation

Brush Management - The removal, reduction, or manipulation of woody trees and shrubs.

Crop Tree Release (CTR) - A silvicultural technique used to enhance the health and productivity of individual trees, while improving other resources such as wildlife habitat, recreation, timber value, and aesthetics.

DBH – Diameter at breast height for a tree (4.5 ft.).

Forest Stand Improvement (FSI) or Timber Stand Improvement (TSI) - An action that landowners can take to improve their woodlands immediately. Four common methods of timber stand improvement include crop tree release, low thinning, cull tree removal, and invasive species removal.

Invasive species – A species that is not native to a specific location (an introduced species), and that has a tendency to spread to a degree believed to cause damage to the environment, human economy or human health.

NRCS – Natural Resources Conservation Service (<https://www.nrcs.usda.gov/wps/portal/nrcs/in/home/>)

Stocking level- A quantitative measure of the area occupied by trees, usually measured in terms of well-spaced trees or basal area per acre.

Timber high grading - The removal of the highest grade timber, leaving only lower quality, less desirable trees

Tree and Shrub Establishment - Establishing woody plants by planting seedlings or cuttings, by direct seeding, and/or through natural regeneration.

Tree and Shrub Pruning - The removal of all or part of selected branches, leaders or roots from trees and shrubs.

Web Soil Survey - Provides soil data and information produced by the National Cooperative Soil Survey. It is operated by the USDA Natural Resources Conservation Service (NRCS) and provides access to the largest natural resource information system in the world (<https://websoilsurvey.nrcs.usda.gov>).

DEER BROWSE MANAGEMENT

This property shows signs of high white-tailed deer densities which is causing a lack of regeneration of valuable species. Many seedlings are showing signs of continuous browse, and there are also heavy trails with deer tracks, and scat.

Some recommendations to lessen the amount of deer predation on young trees and shrubs include: removal of a certain number of antlerless deer by hunting every year, use of repellents, or the development of a wildlife food plot in a different area of the property to draw the deer away from the seedlings.

Deer Population Reduction

The state of Indiana has become more liberal with its antlerless deer bag limits, allowing hunters to keep the population in check. In Parke County the bonus antlerless allowance is 8. In the first year an effort should be made to remove antlerless deer from the property to reduce the growth of the population. With the deer densities on the property being above average the removal of these deer will not totally eliminate the white-tail deer from the property, but will bring the densities to a healthier level. This activity should be performed every year or until the amount of browse is near a tolerable level. ArborTerra can help determine how many antlerless deer should be taken annually.

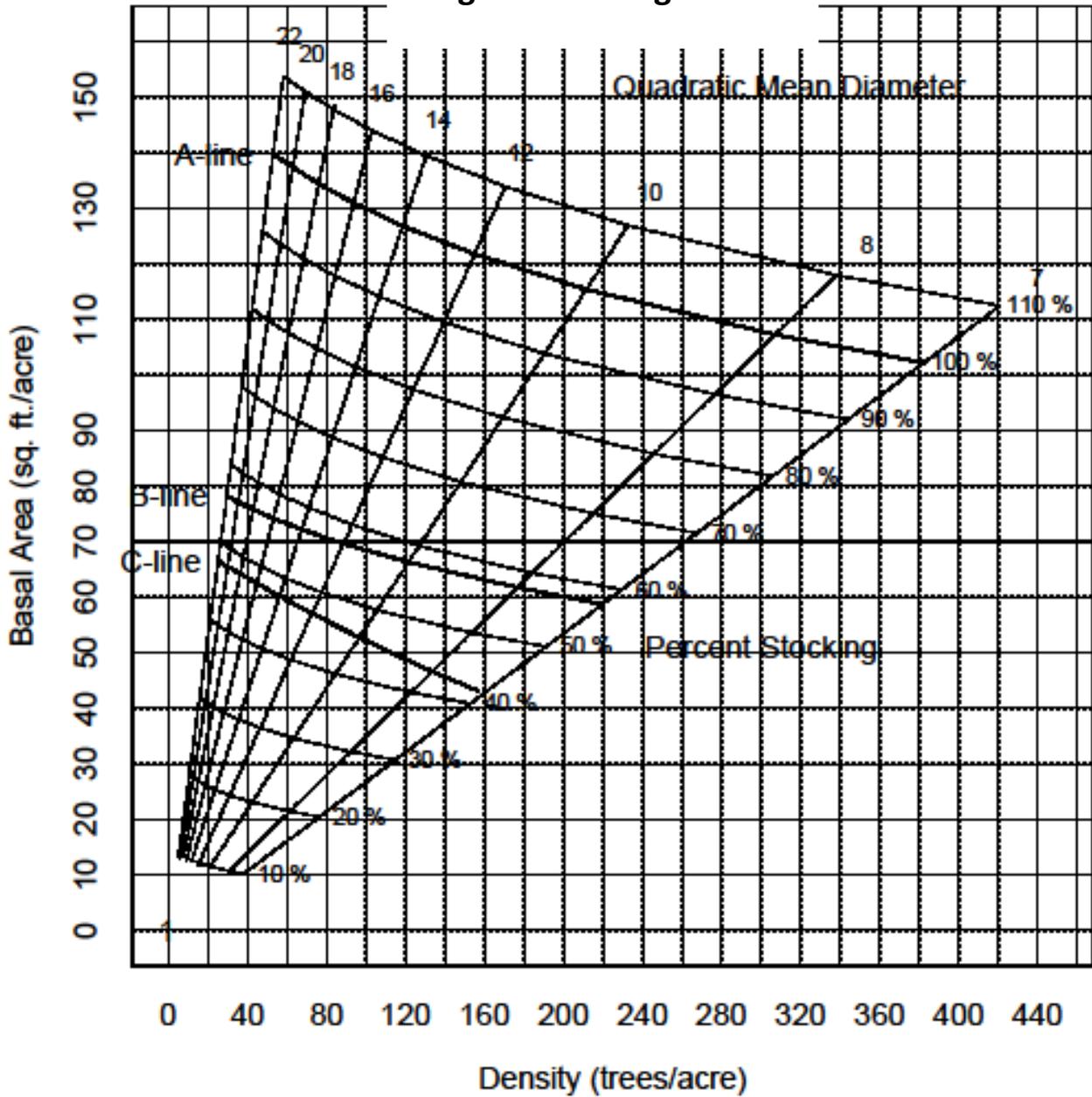
Repellents

Chemical repellents should be applied to plants when white-tailed deer are most likely to browse on young trees and shrubs. This time period would be from late winter into the spring. These repellents are seen as short term tactics and reapplication of chemical is needed until the threat of deer predation is less. Repellents should be used in areas where browse has occurred prior or around freshly planted seedlings.

Food Plots

This tactic for reducing deer browse on the property can be used in a couple different ways. First, a wildlife food plot can be strategically placed away from the area being browsed to draw the deer away from the trees and shrubs. Second, these food plots can be paired with the removal tactic as hunting plots. These will help in filling the current year's antlerless deer quota on the property. Species of plants commonly used in wildlife plots include alfalfa, clovers, chicory, and turnips. These plants need to be available during harsh winter months when food availability is scarce.

Gingrich Stocking Table





Linda Jean Hines (Richard Hines)
Topo Map

ArborTerra Consulting
August 2019

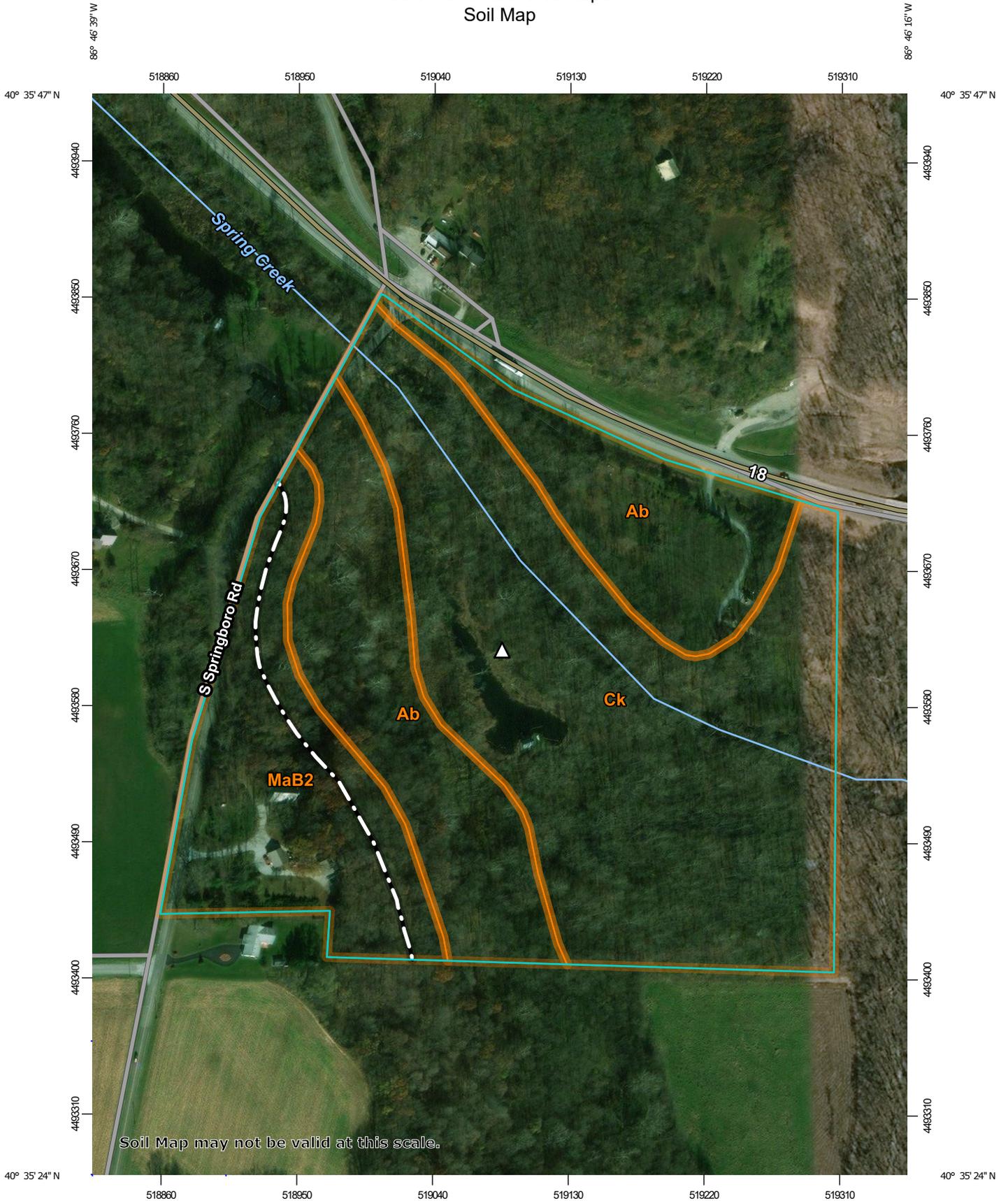


Custom Soil Resource Report for **White County, Indiana**

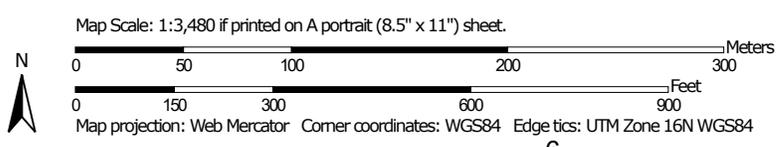
Linda Jean Hines



Custom Soil Resource Report
Soil Map



Soil Map may not be valid at this scale.



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

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 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

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: White County, Indiana
 Survey Area Data: Version 23, Sep 7, 2018

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

Date(s) aerial images were photographed: Nov 7, 2010—Mar 26, 2019

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.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ab	Abscota loamy fine sand, occasionally flooded	11.1	30.7%
Ck	Cohoctah fine sandy loam, occasionally flooded	18.2	50.3%
MaB2	Martinsville silt loam, 2 to 8 percent slopes, eroded	6.9	19.1%
Totals for Area of Interest		36.2	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or

Custom Soil Resource Report

The *volume of wood fiber*, a number, is the yield likely to be produced by the most important tree species. This number, expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI), indicates the amount of fiber produced in a fully stocked, even-aged, unmanaged stand.

Trees to manage are those that are preferred for planting, seeding, or natural regeneration and those that remain in the stand after thinning or partial harvest.

Reference:

United States Department of Agriculture, Natural Resources Conservation Service, National Forestry Manual.

Report—Forestland Productivity (Linda Jean Hines)

Forestland Productivity—White County, Indiana				
Map unit symbol and soil name	Potential productivity			Trees to manage
	Common trees	Site Index	Volume of wood fiber	
			<i>Cu ft/ac/yr</i>	
Ab—Abscota loamy fine sand, occasionally flooded				
Abscota	—	—	—	Baldcypress, Blackgum, Bur oak, Eastern cottonwood, Eastern redcedar, Northern white-cedar, Red maple, River birch, Shingle oak
Ck—Cohoctah fine sandy loam, occasionally flooded				
Cohoctah	Green ash	70	72.00	American sycamore, Baldcypress, Blackgum, Bur oak, Northern white-cedar, Pecan, Pin oak, Red maple, River birch, Shellbark hickory, Shumard's oak, Silver maple, Swamp white oak
	Red maple	72	43.00	
	Silver maple	95	43.00	
MaB2—Martinsville silt loam, 2 to 8 percent slopes, eroded				
Martinsville	Tuliptree	98	100.00	American beech, Black cherry, Black oak, Black walnut, Bur oak, Chinkapin oak, Eastern white pine, Kentucky coffeetree, Northern red oak, Norway spruce, Pecan, Pignut hickory, Shagbark hickory, Shumard's oak, Sugar maple, Tuliptree, White oak
	White oak	80	57.00	



Requirements for the Indiana Bat and Northern Long-Eared Bat

The following guidelines are designed to protect federally listed Indiana bats (*Myotis sodalis*) and northern long-eared bats (*M. septentrionalis*) and are required for all conservation practices anywhere in Indiana that include tree removal/felling. These guidelines are specific to the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) in Indiana in consultation with the US Fish and Wildlife Service (US FWS) Indiana Field Office. Additional restrictions may apply if the project falls within the range of specific bat habitat (e.g., known bat roost trees and hibernacula of either species) as indicated in NRCS business tools processes by the “A92” or “A92h” designation. Contact NRCS State Biologist in these instances.

1. Within the context of this document, the guidance only applies to trees that are *at least five (5) inches or greater at Diameter Breast Height (DBH)*. Native woodland shrubs that are at least five (5) inches or greater DBH are treated as trees.
2. Small clusters of trees¹ (6 or less) may be removed at any time if **all** of the following are true:
 - a. All of the trees are alive. Live trees are considered to be any tree with >10% live canopy.
 - b. The bark on all of the trees is attached tightly to the trees (as opposed to the type of bark found on Shagbark or Shellbark Hickories which allow space for bats to roost).
 - c. There are no visible cavities, crevices, or splits present.
3. Tree clusters up to 0.25 acre may be removed if performed between October 1 and March 31; when near hibernacula felling will only occur November 16- March 31.
4. Forest Stand Improvement (FSI) - including tree thinning, which meets NRCS Indiana FOTG Standard 666 (Forest Stand Improvement), is allowed when performed between October 1 and March 31; when near hibernacula felling will occur November 16- March 31. However, provided that other requirements are met (see below) vine control and girdling activities may occur at any time of year.
5. Standing snags (a tree with <10% live canopy should be considered a snag) that pose a serious human safety hazard will be considered on a case-by-case basis. Contact the NRCS State Biologist at (317) 295-5854 for further guidance.
6. Removal/Felling of non-native invasive woodland shrub² and/or herbaceous plant species, such as bush honeysuckle, multiflora rose, and garlic mustard, is allowed at any time.
7. Removal/Felling of invasive tree species, such as Tree-of-Heaven, will be performed between October 1 and March 31; when near hibernacula, felling will only occur November 16- March 31.
8. Temporary Forest Openings (TFOs) (a.k.a. group openings/small clear cuts) may be created up to 10 acres in size and remove live trees of any size to provide early successional habitat for wildlife and/or to improve regeneration of shade-intolerant tree species (e.g., oaks) provided that **all** of the following conditions are met:
 - a. Tree felling will occur between October 1 and March 31; when near hibernacula felling will only occur November 16- March 31.
 - b. Proposed openings will be situated in forested areas that have approximately 1,250 acres or more of additional surrounding forest habitat³ within a 2.5-mile radius⁴;
 - c. TFOs will not singly or cumulatively exceed 10 acres per every 30 acres of surrounding forest (regardless of ownership);
 - d. Larger TFOs (i.e., 5-10 acres) will be separated by at least 200 feet via forested buffers containing relatively mature overstory trees, and;
 - e. When present, shagbark hickory (*Carya ovata*) or shellbark hickory (*C. laciniosa*) trees will not be harvested or manipulated within a TFO, unless on a stand⁵-wide basis their combined density exceeds 16 trees >11” DBH/acre or the combined basal area is ≥10 sq. ft./acre, and;
 - f. When feasible, at least 3 snags >9” DBH/acre will be maintained or created (via girdling, hack and squirt, etc.) within and/or along the edges of TFOs.

If the project cannot be completed within the parameters listed above, consultation with the NRCS State Biologist (317) 295-5854 is required. These include: 1) Removal/Felling of over 0.25 acre of tree clusters at any time (except for TFOs as defined above); 2) Removal/Felling of trees between April 1 and September 30 (except ‘small clusters of trees’ as defined above); 3) FSI activities conducted between April 1 and September 30. (Hibernacula restrictions may also apply)

¹ Non-native invasive woodland shrubs are not considered to be trees.

² As calculated via GIS data layers or visually estimated from recent aerial photos (e.g., Google Earth imagery).

³ i.e. - 1,250 acres = 10% available forested habitat within a conceptualized 2.5-mile radius Indiana bat maternity colony range.

⁴ “Stand” is defined as a contiguous group of trees sufficiently uniform in age-class distribution, composition, and structure, and growing on a site of sufficiently uniform quality, to be a distinguishable unit. Furthermore, a “stand” is defined as being ≤100 acres in size, containing a canopy of mostly large/sawlog-sized trees (≥11”DBH), and being under a single ownership.