**Forest Management Plan**

**2022**

**Juniata College - Bedford**

1700 Moore Street, Huntingdon, PA 16652

Phone: **814-506-7867**

**PREPARER**

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Completed Under a Program of the

**Alliance for the Chesapeake Bay**

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**This page intentionally blank.SIGNATURES AND APPROVALS:**

This Forest Management Plan (FMP) is provided as a guide to help landowners accomplish demonstrated objectives for their forest. This FMP will act as a guide for landowners in achieving the sustainable benefits of managing their forest resources for the next 10 years. With this FMP, the landowner automatically complies with the standards and benefits of the US Forest Service’s Forest Stewardship Program (if the property is 5 acres or more), the American Forest Foundation’s American Tree Farm System (10 acres or more), and is eligible for NRCS Cost Share Programs. This plan will need to be reviewed and approved by the local NRCS District Conservationist, DCNR Service Forester, Technical Service Provider, and the Forest Landowner.

The Forest Stewardship Program and American Tree Farm Program are designed to promote wise use and sustained benefits of forest resources. While participation in these programs can provide benefits of forest management information networks, national recognition, financial tax savings, and increased forest product income generation through select markets, by NRCS policy, the landowner is not required to participate in these programs. If the landowner wishes to participate in either of these programs, and is applicable given program acreage limitations above, please check the appropriate boxes and proceed to the Landowners Pledge.

**Forest Stewardship Program Participation Tree Farm Program Participation**

**Yes: \_\_\_\_\_ No: \_\_\_\_\_ Yes: \_\_\_\_\_ No: \_\_\_\_\_**

**Landowner’s Pledge for Forest Stewardship/Tree Farm Program Status**

Since timber harvesting has a significant impact on my forest resources, **I agree** to complete commercial timber harvests recommended in the plan with the assistance of a professionally trained forester. **I understand** that the forester is to designate trees to be harvested based on a written prescription derived through a science-based stand analysis of the forested MUs involved. This MU analysis could include methods derived through SILVAH, SILVOH, NED/SIPS, or a Treatment Unit Sustainability Assessment Form (TUSAF), among other methods.

**I understand** that a DCNR Service Forester or consulting forester will periodically review the implementation of my FMP to assist me in properly following the plan for my objectives. To enable him/her to carry out this responsibility, **I will make available** copies of plan amendments and/or timber harvesting prescriptions prior to carrying out a major activity. **I understand** that I am **not obligated to obtain approval** from the service forester but that he/she may advise me if prescriptions do not appear to serve the goals of my FMP or meet Forest Stewardship/Tree Farm Standards. **Should I choose to deviate from the guidelines in the FMP**, **I agree** to return the applicable signs designating my property as a “Stewardship Forest” or “American Tree Farm” to the DCNR Service Forester.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

Landowner Signature Date

**Forest Stewardship/American Tree Farm/NRCS EQIP Program Certifications**

I am satisfied with the content and recommendations contained in this FMP, and will make an honest effort to follow them. I understand that the information within this plan may be used internally by the American Tree Farm System, as well as NRCS and DCNR for conservation planning, and is not protected by legal privacy acts for either governmental agency.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

Landowner Signature Date

I certify that this FMP meets the requirements of the federal Forest Stewardship Program, American Tree Farm Program, and the USDA Environmental Quality Incentives Program and or the Quality Criteria for Forest Management Plans in Section III of the USDA NRCS Field Office Technical Guide.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

DCNR Service Forester Date

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

Technical Service Provider Date

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

NRCS District Conservationist Date

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_

PA Unique ID # (For DCNR Use Only) Tree Farm #

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**PROPERTY OWNERSHIP**

Landowner: **Juniata College**

Mailing Address: 1700 Moore St, Huntingdon, PA 16652

Phone: **814-506-7867** Email: **\_\_­­­­\_\_NA \_\_­­­­­\_\_**

Ownership Type: (LLC, Sole Proprietorship, Trust,etc.): **Fee Simple**

**Landowners Representative (if applicable): Dennis Johnson**

Mailing Address:

Phone: **814-386-5902** Email: **Johnson@juniata.edu**

Year of Property Acquisition by Current Owner: **2019/2020**

Plan Completion Date: **June 21, 2022** Plan Revision Dates: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Please Note:** *Informal updates to the plan can be made with handwritten notes. Be sure to include a date and initial these notes throughout the management plan.*

**Property Description**

**General Directions to the Property**: From Everett, PA, leave town to the north on Rt 26, Raystown Road, for approximately 3.2 miles. Turn right onto Plank Road for about 0.3 miles. Turn right onto Richey Bridge Road for about 1.4 miles. The driveway is on the left. Approximate coordinates of the driveway entrance - N40.056375 W-78.333448. The property can be accessed from 2 locations. Access (perhaps walk-in only) from Brailler Station Road (1.1 miles from Plank Road) can be found at coordinates N40.060316 W-78.335995.

**For descriptive purposes**, the property lies on the north side of Richey Bridge Road and east of Brailler Station Road. Roughly shaped like an eagle head with the beak to the NNE, the long axis of the property runs northwest-southeast at about a 120-degree angle from north. The eastern boundary of the property is the Raystown Branch of the Juniata River. Acreage was determined using Google Earth Pro software and mapping from points found in the field.

Nearest City/Town: Everett, PA County: Bedford

Total Ownership Acreage: 438 Forested Acreage: 337.59

Does Landowner Reside on Property? \_\_\_\_\_Yes \_\_\_XX\_\_\_No

**Basic Topography (Indicate Topography Description...) (check)**

Complex Topography (e.g., many slopes and aspects) \_\_\_\_

Simple Topography (e.g., mostly gentle slopes and few aspects) \_\_XX\_\_\_

**Entire Forest Property Access to Vehicles (check):**

\_\_\_\_\_Excellent (80% Accessible) \_\_\_\_\_Good (50%) \_XX\_\_ Fair (25%)

\_\_\_\_Poor (10% or less)

**Property Located in Which Watershed:**

\_\_XX\_Chesapeake Basin \_\_\_Delaware River Basin \_\_\_Ohio River Basin

\_\_\_Great Lakes Basin

# Forest Management Goals-

1. education opportunities in natural resource and wildlife management

2. promote/enhance flora and fauna biodiversity on the property

3. follow scientifically-based forestry practices to meet stand-level objectives

**Property History:**

The historical photos show that the property usage is relatively unchanged since the late 1930s (see historical photos from 1939 and 1994). Juniata College acquired this property around 2019/2020. In the late 1980's a majority of the property was subjected to an overstory removal harvest in which at least 90% of the mature trees were removed. This explains why a majority of the stands on the property are in a large-pole timber size class at the time of data collection. It also explains why species such as white pine (likely not a target species for removal) are largely sawtimber-sized and there are mature trees of sawtimber size-class in areas that are inaccessible for extraction. Generally speaking, the entire property has regenerated well from that 30+ year old overstory removal and the species that dominate the different stands likely do so based upon edaphic characteristics of the specific growing site alone.

**Property Maps**

1. Topographic Maps (2) -Landscape map showing property boundaries only and surrounding landscape for 2-mile radius. Property map showing: property boundaries, forest MUs (NRCS Fields), special sites (wetlands, cultural features, natural features favored by landowner, etc.) water resources, roads, map scale, and a directional arrow. (See Appendix IV)
2. Aerial Photograph (1) - Color Aerial Photo showing: property boundaries, forest MUs (NRCS Fields), special sites (wetlands, cultural features, natural features favored by landowner, etc.) water resources, roads, map scale, and a directional arrow. Aerial photos can be derived through GIS, county assessment offices, DCNR PAMAP program online, or the following website. <http://earth.google.com/> (See Appendix IV)
3. Soils Map (1) - including legend, interpretations, etc. Soil maps are available from NRCS Web Soil Survey: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm> or from your local NRCS office. A single map of the tract will be shown in Appendix IV. (See Appendix IV) In order to conserve paper, the complete websoilsurvey reports will be provided in soft copy only.

**Overall Forest Natural Resources Enhancement and Protection:**

**PROTECTION OF SPECIAL SITES AND SOCIAL CONSIDERATIONS**

**Special Sites:** An old farm house stands at the eastern end of the property outside for the forested area. The house and associated infrastructure serves as a school meeting and temporary lodging facility. Should any be discovered in the future, the owner should report it to the State Historical Preservation Officer (SHPO) (*see website at* [*www.phmc.pa.gov/about/contact*](http://www.phmc.pa.gov/about/contact) *to get contact info)* to determine its cultural significance. If any other cultural features are discovered, the owner should contact the SHPO to determine their historical significance before disturbing or conducting forest operations near them.

**Adjacent MU or Ownership Concerns:** Marks facing both directions would allow people to know when they are about to enter/exit the property.

**Recreation:**  The area is used by the owner for outdoor educational pursuits.

**Timber Trespass Prevention**: Clearly identifying (via painting and posters) and remarking the boundary on a regular basis, either 20% a year or the entire boundary every 5 years, helps the landowner and adjoiners to know where the property limits are.

**AIR, WATER, AND SOILS PROTECTIONS**

**Forest Soils Protection:** Soils throughout the forested management units are a mix of many soil types and will be addressed in each stand description. See the NRCS soil report (electronic copy only) for additional information.

Small channels caused by surface water runoff degrade soil quality and tend to increase in size. Soil water runoff is controlled sufficiently on the property to stabilize the small channels and prevent reoccurrence of new channels.

Best management practices should be utilized to minimize erosion and compaction both on and off any trails. An erosion and sedimentation (E&S) plan should be written **prior** to beginning any forest management activity and accurately implemented as activities are conducted. Log landings and haul roads should be properly sited, constructed, and stoned to minimize compaction and runoff impacts.

**Access Roads/Trails:** If new roads or skid trails are required, a Best Management Practice (BMP) is to lay out road, trails, and skidways to avoid residual trees. Skidways should be laid along the contour with slopes between 3 and 7% to promote drainage and minimize erosion. Roadways should be properly constructed in accordance with the **approved** E&S plan. After use for harvest, new roadways, paths, and trails should be seeded with legumes to control erosion and benefit wildlife.

**Streams, Wetlands, Vernal Pools:** The west side of the property drains into the Johns Branch creek, a tributary of the Raystown Branch Juniata River. The east side of the property drains directly into the Raystown Branch of the Juniata River, a tributary of the Juniata River, and eventually, the Susquehanna River. Tributaries of the Raystown Branch between Brush Creek and Sherman Valley Run are designated as Warmwater fisheries with migratory fish (WWF, MF). The mainstem of the Raystown Branch between the Somerset-Bedford line and the Bedford-Huntingdon line is designated as Trout stocked fisheries, with migratory fish (TSF, MF). Designations were found under PA Code, Chapter 93.9N, Water Quality Standards. A Best Management Practice (BMP) is to establish a 100 ft buffer for harvesting activities around watercourses on the property to protect them from E&S effects.

No wetlands are shown by the USFWS as existing on the property. (see map at Appendix IV)

**FISH, WILDLIFE, AND BIODIVERSITY**

**Fish and Wildlife:** Many habitat improvements are labor intensive. Consult with the PA Game Commission, DCNR forester, or a wildlife professional about developing a planting plan after thinning activities to maintain areas in conditions beneficial to wildlife. A partnership with an interested organization may be the key to providing the labor required for promoting habitat improvement. Activities for wildlife habitat improvement could include:

* Apply for EQIP Forestry funds at your county USDA NRCS office for habitat improvements.
* During thinnings, release oaks and hickories (cut down adjacent trees) to increase hard mast production in your forest.
* Evergreen species (pine, spruce) provide winter thermal cover. Retain at least 5% of the acreage in scattered clumps of evergreen species. Along the forest edge, plant islands of native shrubs to provide food and cover. Plant shrubs for wildlife food sources along forest edge (at a rate not to exceed 5% of forest area).
* Preserve snags and den trees in your forest. Allow dying trees to fall naturally unless they are a safety hazard. Leave coarse woody debris on the forest floor to provide ground cover, or enhance ground cover by building brush piles.
* Manage roads and skid trails to prevent erosion and benefit wildlife. Regrade skid trails to minimize erosion when harvest operations are finished. Replant trails and landings in legumes, mowing two to three times per growing season to maintain legumes.

**Analysis of the plots using Silvah shows the following Information on Wildlife Habitat.**

**Please note that the following is an automated product of the SILVAH program which must be included in this plan, but it is not necessarily a reflection of the preparer’s judgement. Also, additional plant species may be noted elsewhere in the Plan that were not within a sampling plot.**

**Mast, Forage and Browse resources**

Hard mast such as hickory nuts, acorns and beech nuts are foods that can be consumed immediately or stored for use during the winter season. They are required by many wildlife species, including bears, squirrels and mice. The stand has 47.1 sq.ft. of trees that produce high-quality hard mast (chestnut oak, northern red oak, white oak, black oak, scarlet oak, ironwood and black walnut), and 47.7 sq.ft. of other hard mast producers (black cherry, white pine, sugar maple, red maple, Virginia pine, blackgum, sweet birch, black locust, yellow poplar, cucumber-tree, eastern hemlock and white ash). The understory data has three species that produce high-quality hard mast (chestnut oak, ironwood and northern red oak) and two of other hard mast producers (black cherry and sugar maple).

Soft mast (fruits), such as cherries and berries are high energy foods required by many wildlife species including bears and many species of migrating songbirds where high energy sources are of key importance during fall migration. The stand has 15.1 sq.ft. of trees that produce high-quality soft mast (black cherry, blackgum, serviceberry and flowering dogwood), and 0.4 sq.ft. of other soft mast producers (cucumber-tree). The understory data has two species that produce high-quality soft mast (black cherry and huckleberry) and no other soft mast producing species.

Browse is a critical food resource for herbivores such as deer, rabbits, and cottontails. Because most herbivores of concern are ground foragers, only understory vegetation is considered in this report. This stand contains two species that produce high-quality browse (chestnut oak and northern red oak) and four species that produce lesser quality browse (black cherry, huckleberry, ironwood and sugar maple). The distribution of browse across the stand is poor, 19.6 percent of plots have at least one browse species.

This stand has four species that provides exceptional additional wildlife food in the form of insects and nectar totaling a basal area of 16.7 sq.ft. (black cherry, white oak, black locust and yellow poplar). Another fourteen species totaling 69.5 sq.ft. provide some additional food value (chestnut oak, northern red oak, white pine, sugar maple, blackgum, sweet birch, black oak, scarlet oak, serviceberry, flowering dogwood, ironwood, cucumber-tree, black walnut and eastern hemlock). The understory has one species that provides exceptional additional wildlife food in the form of insects and nectar (black cherry). Another five species provide some additional food value (chestnut oak, huckleberry, ironwood, northern red oak and sugar maple). These additional food resources support many songbirds and pollinators.

**Snags Cavities and Dens**

Snags and den trees provide shelter for a wide variety of wildlife including owls, ducks, woodpeckers, songbirds, squirrels, fishers, and other mammals. They are also used for foraging by various birds, mammals and amphibians. There are no snags recorded in your data. Research suggests a minimum of 3 snags per acre of varying diameter and stage of decay. To create snags (by girdling), this stand has 14.6 sq.ft. of sawtimber size trees that have exceptional value as snags (white pine, sugar maple, white oak, Virginia pine, black locust and eastern hemlock).

**Stand Structure and Composition**

Structurally diverse forests support a greater diversity of wildlife. Understory structure provides foraging and nesting substrate, and escape and roosting cover for birds and mammals. Evergreen and ericaceous species provide thermal cover, structural complexity, nesting and foraging substrate, and compositional (or habitat) diversity for deer, grouse, turkey, black-throated green and -blue warblers, and other species. The stand has three evergreen trees with a basal area of 13.2 sq.ft. (white pine, Virginia pine and eastern hemlock) and no ericaceous trees. The understory has one ericaceous species (huckleberry) and no evergreen species.

Structure is contributed both by the attributes of individual trees and species (branching habit, foliage type) and by the distribution of trees horizontally and vertically in a stand. So-called "wolf trees" with large trunks and large, low, horizontal branches are selected by several canopy-nesting bird species. Horizontal diversity can be promoted with reserve islands and variable-retention harvests. While most users of SILVAH do not collect height data, height and diameter are closely related, so we can infer the vertical structure of a stand by the proportion of trees in each diameter class.

|  |  |  |  |
| --- | --- | --- | --- |
| High Stand Structure Value Species by Size Class | | | |
|  | **Basal Area** | **Percent BA** | **Species List** |
| **Saplings** | 3.57 | 3.50 | blackgum, serviceberry, flowering dogwood and ironwood |
| **Poles** | 0.54 | 0.53 | serviceberry and cucumber-tree |
| **Small sawtimber** | 0.54 | 0.53 | yellow poplar |
| **Medium sawtimber** | 0.18 | 0.18 | eastern hemlock |
| **Large sawtimber** | 0.00 | 0.00 |  |
| **Total** | 4.82 | 4.73 | blackgum, serviceberry, flowering dogwood, ironwood, yellow poplar, cucumber-tree and eastern hemlock |

**State and Federal Endangered Species-Plants and Animals**

**One species of special concern** was identified by the PGC and USFWSper the PNDI received 6-16-22 (endangered bats) and four (4) species of concern were identified by the PA DCNR (purple bedstraw, shale-barren evening primrose, an unnamed sensitive species, and red-cedar mixed hardwood rich shale woodland). Acknowledging compliance with the conservation measures will require no further action for the bats. Additional information has been submitted for the DCNR review. (See Appendix III)

**MANAGEMENT OF FOREST RESOURCES:**

**Sampling and Calculations:** Sampling was done using a 10-factor prism for variable radius sample points. Fifty-six (56) overstory and understory sample points were collected. Diameter breast height (DBH) was collected in 1-inch size classes. All live trees 1 inch or more DBH were tallied. Analysis was done using SILVAH software, a timber analysis software developed by the US Forest Service. All calculations use the Scribner rule form class 78. **Full Silvah 7 analyses are provided in soft copy only.**

**Protection from Pests:** (*Consider native and invasive insects, weeds, diseases, etc., as well as control, monitoring, and prevention guidelines utilizing integrated pest management through means of physical, mechanical, biological, cultural, or chemical management*.)

**Invasive species: Ailanthus, garlic mustard, Japanese barberry, Japanese stiltgrass, multiflora rose, and oriental bittersweet** were found in the inventoried areas. Invasive plant removal by herbicide, although possible, can be complicated by interspersion with desired species and proximity to water resources. Additional information on managing many of these invasive plants can be found in the electronic copy of the Silvah analyses.

Found during the inventory process, the Tree-of-heaven (***Ailanthus*** *altissima*) is an invasive tree which cultivates in forest openings and edges. Very difficult to eliminate once it gains a foothold, early finding and elimination is the key to controlling it. A link for more information on invasive species is listed below with PA DCNR information under Professional Assistance. **Cutting this tree causes root sprouts to occur**. So, herbicide application is the preferred method of removal. Additional information is available at <http://plantscience.psu.edu/research/projects/vegetative-management/publications/roadside-vegetative-mangement-factsheets/3ailanthus-on-roadsides>. Recent research has shown that a native fungus (*Verticillium*) can be used to control Ailanthus. A free Penn State webinar (1 hour) briefing on this method is available at <http://extension.psu.edu/natural-resources/forests/courses/pa-forests-web-seminar-center/archive/forest-health-insect-and-disease-briefings/2016>.

**USDA** has recognized that multiple years of eradication efforts may be required to eliminate invasive species from a MU.

*NRCS PA Targeted* ***Woody*** *Plant Species Requiring Multiple Year Treatment (PA314)*

**Common Name / Scientific Name**

Autumn olive *Elaeagnus umbellata*

Callery pear *Pyrus calleryana*

Common privet *Ligustrum vulgare*

Glossy buckthorn *Frangula alnus*

Japanese barberry *Berberis thunbergii*

Japanese honeysuckle *Lonicera japonica*

Japanese knotweed *Fallopia japonica*

Multiflora Rose *Rosa multiflora*

Norway maple *Acer platanoides*

Oriental bittersweet *Celastrus orbiculatus*

Russian olive *Elaeagnus angustifolia*

Tree-of-heaven *Ailanthus altissima*

Tartarian honeysuckle *Lonicera tatarica*

Wineberry *Rubus phoenicolasius*

Poison hemlock *Conium maculatum*

Poverty brome *Bromus sterilis*

*NRCS PA Targeted* ***Herbaceous*** *Plant Species Requiring Multiple Year Treatment (PA315)*

**Common Name /Scientific Name**

Bull Thistle or Spear Thistle *Cirsium vulgare*

Canada Thistle *Cirsium arvense*

Cheatgrass *Bromus tectorum*

Crown-vetch *Coronilla varia*

Dames rocket *Hesperis matronalis*

English ivy *Hedera helix*

Garlic mustard *Alliaria petiolata*

Greater celandine *Chelidonium majus*

*NRCS PA Targeted* ***Herbaceous*** *Plant Species Requiring Multiple Year Treatment (PA315) (cont.)*

**Common Name /Scientific Name**

Japanese hops *Humulus japonicas*

Japanese knotweed *Fallopia japonica*

Japanese stiltgrass *Microstegium vimineum*

Jimsonweed *Datura stramonium*

Johnson Grass *Sorghum halepense*

Lesser celandine *Ranunculus ficaria* Musk Thistle or Nodding Thistle *Carduus nutans*

Purple Loosestrife *Lythrum salicaria*

Reed canary grass *Phalaris arundinacea*

Shattercane *Sorghum bicolor*

Spotted knapweed *Centaurea stoebe*

Mile-a-Minute *Polygonum perfoliatum*

**No evidence of Spongy Moth** was noted on the sample plots. Recommend future activities aim to maintain the oak concentration in stands below 25% to minimize liability for losses to this pest. If stands get above 25% oak concentrations, additional monitoring and control measures for insect pests may be required. Additional guidance for monitoring and spray control programs should be available through the Bedford County Conservation District or the DCNR forester (listed on the cover of this plan). Additional information is available at [www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr\_20026635.pdf](http://www.dcnr.state.pa.us/cs/groups/public/documents/document/dcnr_20026635.pdf).

Hemlock was found among the tallied trees. Hemlock in PA suffers from an infestation of an insect known as the Hemlock Wooly Adelgid. Once a hemlock is infested with the **Wooly Adelgid** (HWA), it is usually dead within 10 years. Additional information is available at [www.dcnr.pa.gov/Conservation/ForestsAndTrees/InsectsAndDiseases/Pages/default.aspx](http://www.dcnr.pa.gov/Conservation/ForestsAndTrees/InsectsAndDiseases/Pages/default.aspx) .

In addition to Wooly adelgid, (HWA), **elongate hemlock scale** (EHS) (Fiorina externa) infests hemlocks and cause mortality, particularly where both HWA and EHS infest the same tree(s). Any protection plan should consider EHS as well as HWA. Additional information is available at <http://ento.psu.edu/extension/factsheets/elongate-hemlock-scale>

Ash trees were noted in the inventory process. The property is within the area of an infestation of the **Emerald Ash Borer**. Boring through the cambium bark layer, this insect can kill an ash tree within a few years of infestation. Additional information is available at [www.dcnr.pa.gov/Conservation/ForestsAndTrees/InsectsAndDiseases/Pages/default.aspx](http://www.dcnr.pa.gov/Conservation/ForestsAndTrees/InsectsAndDiseases/Pages/default.aspx)

A recent infestation of **Spotted Lanternfly** has caused Pennsylvania to quarantine 45 counties in PA. **Bedford county** is part of the quarantine area. The insect can cause damage to forest and fruit trees as well as agricultural crops. Additional information can be found at [www.extension.psu.edu/spotted-lanternfly](http://www.extension.psu.edu/spotted-lanternfly) .

**Beech bark disease** is an interaction between wounds in the tree caused by a non-native insect and a fungus that enters the wounds, infecting the tree. More information can be found at [www.extension.psu.edu/beech-diseases](http://www.extension.psu.edu/beech-diseases).

**Oak wilt**, a disease that kills oak trees and is often spread through underground root grafts. This disease has been found in several Pa counties, including **Bedford** County. More information can be found at [www.extension.psu.edu/oak-wilt](http://www.extension.psu.edu/oak-wilt).

**Reforestation and Afforestation:**

In order to promote sustainable harvests, a healthy forest should have a diversity of trees and other plants, forming several layers giving it vertical structure from the forest floor to overstory. There should be an herbaceous layer, a shrub layer, understory, mid-level, and overstory layers. Snags (standing dead trees), den trees, and downed trees should be present to offer differing types of wildlife cover. Species that supply hard mast (acorns and nuts) and soft mast (fruits, berries, seeds) should be present for wildlife food sources.

In order to have a forest structured for sustainable harvests (and periodic income over time), the distribution of size classes within the management unit should be balanced. MU size classes are based on the "average" MU diameter, which is calculated as the medial diameter (MD) of all trees 1.0 inches diameter breast height (dbh) and larger. **Note that the diameter breaking points for MU size classes do not correspond to the diameter breaking points for individual tree size classes**. For example, individual trees grow from the sapling class to the pole class when they exceed 5.5 inches dbh, but MUs with a medial diameter of more than 4.5 inches are pole sized. This is because the MU diameter usually lags behind the average diameter of the crop trees in the MU.

The **MU size classes** are: Sapling MUs = MD less than 4.5”, Small pole MUs = MD between 4.5" and 7.5" (Such MUs will rarely support commercial cutting.), Large pole MUs = MD between 7.5" and 10.5". (These MUs may support a combined commercial thin-TSI (timber stand improvement) if there is a good pulpwood market.), Small sawtimber MUs = MD between 10.5" and 13.5" (In most areas, small sawtimber MUs will support commercial thinning.), Medium sawtimber MUs = MD between 13.5" and 16.5" (Medium sawtimber MUs will support commercial thinning or thin-harvests.), and Large sawtimber MUs = MD larger than 16.5" (Such MUs usually have a MD in merchantable-size trees of 18" or more, and are economically mature.).

Ideally, size classes should reflect the following as a percentage of area: Regeneration – 5-10%, Saplings and poles – 35-45%, Small sawtimber – 25-35%, and Large sawtimber – 10-15%. These percentages reflect the number of years normal growing trees remain in each stage. The owner, in management activities, should be aware of these ratios to achieve a sustainable harvest. Therefore, for periodic cutting, an owner would normally cut approximately 10% of his/her timber each decade (or 25% of the forest every 25 years). The forested portion of this property currently has **68% in pole size and 32% in small saw timber** when analyzed by Silvah**.** In managing the property, the owner should continue to utilize a consulting forester to determine appropriate thinning and harvest techniques that move toward the ideal forest structure while meeting the owner’s objectives.

Overall, the inventory determined a low seed supply is available. Acorns are listed as inadequate to regenerate oak stands. Forest regeneration will generally rely on natural reproduction. If this is unsuccessful, planting seedlings may be required. Even aged silviculture is normally recommended because all-age silviculture (a forest with trees of all ages) is usually not successful in areas with high deer pressure. All-age management is a complex operation that requires shade tolerant species, low deer pressure, and working closely with a consulting forester and the state DCNR forester. Analysis of the inventory data found that **stands 1,2, and 6 have the correct distribution of diameters, proportion of sawtimber, and density of shade-tolerant species to implement all-age management**.

**Interfering vegetation** was noted on **41% of the plots.** Interfering vegetation such as huckleberry, ironwood, and invasive species crowd out or overshadow the more commercially desirable small trees. Some of these species, although not good for growing commercially valued trees, may provide cover and food sources for wildlife. The client may wish to consult a wildlife expert **before eliminating these plants from the stand**. Mechanical and/or a basal spray herbicide removal prior to attempting to establish regeneration is recommended.

**Deer management** – While fields provide some attraction and promote sightings, they do little to improve habitat and could promote disease transmission. Controlling populations to prevent over-browsing is essential to good habitat management. Early successional habitat and controlling invasive species to promote favored browse species are ways to promote good browse habitat. Deer exclosures may be utilized to evaluate the deer pressure on natural regeneration. Exclosures are small fenced circles (8 ft diameter) that allow natural regeneration to occur without deer interference. To reduce deer pressure, the client may want to consider enrollment in the **PGC DMAP** program. Note: as currently administered, DMAP does NOT require that lands be opened to public hunting.

**Planned Plantings:** None planned at this time

**High grading** is a logging practice where the best trees are harvested and the remaining trees are usually of poor form or low value.

**Firewood** may be taken from the property for cold weather heating purposes. When gathering firewood, the owner should look to remove poorly formed or defective trees, particularly if they are near a potential crop tree. (See Appendix VI on crop tree release)

**Prescribed Fire:** none considered at this time. Prescribed fire for forest management purposes entails a lot of trained and certified manpower and resources to utilize properly. It requires very tight environmental conditions and may be cancelled at the last minute due to winds or low humidity. In addition, there is a high liability on the land owner should the fire escape the controlled area.

**Forest Management Plan Implementation Constraints:**

None noted at this time.

**Carbon Sequestration:** Carbon sequestration is a program of storing the earth’s carbon as vegetation, then trading credits on the global market with entities that are unable to meet local or global targets for pollution reduction. If program participation is desired, carbon sequestration requires a rigorous, highly detailed forest inventory accomplished by a qualified professional resource manager who is certified to complete such specific inventories and apply them towards carbon credit markets. The Stand Typing and information required for the CAP 106 FMP does not in any way meet basic standards for carbon inventories or markets. This carbon market inventory would come at an additional cost to the landowner set forth by the Consultant Forester.

The Nature Conservancy (TNC) has a program for smaller, family-owned properties in PA, MD and WV counties. The Family Forest Carbon Program takes an approach where monitoring and measurement of carbon is practice-based, meaning the carbon is calculated based on forest stock changes, rather than the costly forest carbon inventories. This reduces expenses to landowners by 75% compared to traditional carbon offsets markets. The main cost is getting a forest management plan developed. There is a 30-acre minimum to enroll. Enrollment is for a 20-year period. More information can be found at [www.forestfoundation.org/family-forest-carbon-program-landowners](http://www.forestfoundation.org/family-forest-carbon-program-landowners).

Another program is available atinfo.ncx.com/Pennsylvania. With only an annual contract, it appears to be geared to those who do not wish to make a 20-year commitment.

A PSU extension service comparison of the two programs is available at [What is Selling Forest Carbon Like? Three Landowners’ Experiences (psu.edu)](https://extension.psu.edu/what-is-selling-forest-carbon-like-three-landowners-experiences).

**PROFESSIONAL ASSISTANCE:**

The owner may utilize the USDA NRCS, the PA Game Commission, the Bedford County Conservation District, and the PA DCNR forester. Membership in the local Woodlands Association could provide further guidance and a shared experience.

The **USDA Natural Resources Conservation Service** (NRCS) offers guidance and programs to encourage conservation practices. Questions may be addressed to the District Conservationist for Bedford County. They can be contacted at the USDA-NRCS Service Center, 702 West Pitt St, Bedford, PA 15522 (Phone: 814-310-3285). Additional information may be gathered at the website: [www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/](http://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/).

The **PA DCNR Bureau of Forestry** provides free advice to property owners. Questions may be addressed to the local DCNR service forester for Bedford County, Dave Scamardella, at 25185 Great Cove Road, McConnellsburg, PA 17233 Phone: 717-485-3148. PADCNR also has a website dealing with control of invasive plants. [www.dcnr.pa.gov/Conservation/WildPlants/InvasivePlants/Pages/default.aspx](http://www.dcnr.pa.gov/Conservation/WildPlants/InvasivePlants/Pages/default.aspx).

The **PA Game Commission** has a Wildlife Biologist who can provide guidance on manipulation of habitat to provide wildlife considerations. At the time of this writing, Bedford County is under the PA Game Commission Southcentral Office, 8627 William Penn Highway, Huntingdon, PA 16652. Phone: 814-643-1831.

The **Bedford County Conservation District** has programs to assist local landowners in conservation efforts. Their website is [www.bedfordcountyconservation.com](http://www.bedfordcountyconservation.com) . You may contact Jennifer Lentz Kovacs, District Manager, at 702 West Pitt Street, Fairlawn Court, Suite 4, Bedford, PA 15522. Phone – 814.623.8099.

A **woodlands association** provides peer to peer contact for landowners. The Bedford County woodlands association is the Woodland Owners of the Southern Alleghenies. That association can be reached at: Dave Scamardella, PO Box 253, Everett, PA 15537 Phone: 717-485-3148 Email: [jeffosborn@pa.gov](mailto:gehoy@pa.gov).

**OTHER:** The American Forest Foundation offers discussions and guidance on a variety of forest land owner topics including wildlife management, legacy planning, and timber production at [www.mylandplan.org](http://www.mylandplan.org).

The state of Vermont issued guidance on timber harvesting for private landowners in 2015. This 71-page document can be found <http://fpr.vermont.gov/sites/fpr/files/Forest_and_Forestry/Your_Woods/Voluntary_Harvesting_Guidelines/VHG_FINAL.pdf> for your reference. You may need to type or copy-and-paste address into your web browser.

A nonprofit organization dedicated to **deer management** can be found at [www.qdma.com](http://www.qdma.com).

PSU extension has prerecorded webinars on the topic of **deer management** and leaving a woodlands legacy available at [www.extension.psu.edu/natural-resources/forests/courses/pa-forests-web-seminar-center/archive](http://www.extension.psu.edu/natural-resources/forests/courses/pa-forests-web-seminar-center/archive) .

This property has a large percentage of oak species. Small oaks (saplings and poles) can be utilized as a growing medium for **mushrooms** while improving the forest health by reducing crowded conditions in stands. PSU extension also has information on various **non-timber forest products** at [Forest Products - Forest Products - Forests and Wildlife (psu.edu)](https://extension.psu.edu/forest-products) . Topics include **mushrooms,** maple syrup, ginseng and medicinal plants. More information can be gathered at forestry webinars.net - [On-demand Webinars — The Webinar Portal (forestrywebinars.net)](https://forestrywebinars.net/previous-webinars).

The PA Forestry Association can be a source of information. It is found at [www.paforestry.org](http://www.paforestry.org).

The Sustainable Forestry Initiative (SFI) has a PA website at <https://sfiofpa.org/pages/sustainable-forestry/>. A quick assessment and reference decision key are available at Appendix VI.

**MGT UNIT LEVEL INFORMATION**

*These MUs are identified in aerial photos and topo maps in Appendix IV. Technical Silvah analysis narratives are located at Appendix V.*

**Mgt Unit: Stand 1 Acres: 74.4** **(Forest Type, Size, Stocking: BB22)**

**Description: “***This stand is primarily dominated by sugar maple and is mesic in nature, as should be no surprise since a majority of the stand resides on a north-facing slope. It appears that a majority of this stand was spared from the large-scale overstory removal harvest. This is likely due to the extremely steep slopes in some areas.”*

Under analysis, the **overstory** consists of occasional large (0.3/ac), medium (1.8/ac), and small (35/ac) sawlog trees. The stems are 32% sugar maple, 27% mixed oak, 10% red maple, and the remainder in hickory, black cherry, poplar, white pine, hemlock, and elm. About 85% of the overstory stems are acceptable growing stock.

The **middle story** consists of about 77/ac pole size trees. The pole stems are about 28% sugar maple, 25% mixed oak – mostly chestnut oak, 11% each hickory and cucumber, and the remainder in red maple, black cherry, serviceberry, and white pine. About 76% of the mid-story stems are acceptable growing stock.

The **understory** consisted of saplings (142/ac), ironwood, huckleberry, and invasive species. The saplings are about 37% chestnut oak, 19% each sugar and red maple, 13% serviceberry, and the remainder in black cherry and black gum. About 57% of the understory saplings are judged as acceptable growing stock.

The **soils in stand 1** are mostly Weikert channery silt loam. The extreme north end of the stand is a Dystrocrepts-Rock outcrop complex. Both are considered well drained soils.

About 5% of the plots indicated adequate regeneration. About 80% of the plots recorded invasive species. Ferns were not interfering. Grasses were interfering on 40% of the plots. Grapevines were a problem on 60% of the plots. Interfering vegetation occurred 80% of the time. Seed source of desirable species is low. The acorn supply is rated as inadequate. Deer pressure appears to be moderate. The elevation of the stand is 1000 to 1380 feet above sea level. The area has a general aspect range of 50 through 130 degrees. Slopes of up to 89% exist in the stand.

While complete elimination and total coverage of invasive species is the goal, they are *invasive species*, easily spread by wind, animals, and humans.  Treatments are much more effective and easier to apply if completed prior to any harvest or opening of the canopy. Involving a potential contractor prior to establishing an NRCS contract for invasive removal is encouraged so that all involved parties have a clear understanding of the expected outcomes and costs. Methods of removal may vary but desired levels of population reduction in the management unit should be 80 to 85 percent with each treatment. Follow-up evaluation and repeated treatments should be planned to ensure invasive species are found on no more than 10% of plots, especially if resistant species are present. Continue monitoring invasive species until adequate desirable regeneration has occurred.  If levels rise above 25 percent before regeneration is firmly established, additional treatments may be required.

State code of BB – Northern hardwood Forest, site class 2 – project main stem of 30-40 ft at maturity, and Stocking class 2 - Majority of the dominant and co-dominant trees are 12-18” Dbh and > 50% stocked.

**Landowner Objectives:**

1. Provide education opportunities in natural resource and wildlife management
2. Promote/enhance flora and fauna biodiversity on the property
3. Follow scientifically-based forestry practices to meet stand-level objectives Overall notes of the property and history:

**Management Recommendations**:

1. When out of control, exotic invasive vegetation is can prevent the development of desirable seedlings and native shrubs. An effort should be made to identify the worst patches of **exotic shrubs and herbaceous vegetation** (barberry, garlic mustard, ailanthus oriental bittersweet, stiltgrass) as well as **grapevines** (60% of plots) and kill them by **herbicide application**. Scattered exotics should also be treated as far as is logistically practical. (and try not fall off the cliffs) Stilt grass and garlic mustard should be controlled along trails, streams, and in openings to the fullest extent possible. Patches of stilt grass should be obvious even when it is not green.

After removing large patches of stiltgrass, reseed bare soil with a **pollinator** mix to prevent/control resurrection of the stiltgrass.

2. Silvah has recommended **defer cutting due to low density. Grapevines should be treated regardless of harvest decision.**

Keep in mind the **PNDI conservation measures** if considering any harvesting.

One way of accomplishing a light thinning is to use **crop tree release methods** to select small trees for removal and to be utilized **for growing of mushrooms**.

With more than 3,000 board feet/acre (bf/ac), consider **enrolling in a carbon program**. Two programs are listed in the Carbon Sequestration section above. Get paid to let the trees grow. Check to see potential enrollment in Growing Mature Forest with FFCP but the stand’s inaccessibility may disqualify it. In this case, NCX may also be a viable option.

Any harvesting should be followed up by **regrading of roadways**, **seeding roads** with legumes to control erosion and benefit wildlife, and **checking regeneration** for the following 3-5 years.

3. If collecting firewood or removing poorly formed trees to grow mushrooms in the stand, utilize **crop tree release** considerations outlined in Appendix VI.

**Mgt Unit: Stand 2 Acres: 83.6 (Forest Type, Size, Stocking: BC23)**

**Description: “***Stand 2 is primarily dominated by black cherry and northern red oak. There is also an abundance of associated hardwoods present, oak in xeric soil pockets and yellow-poplar cucumber tree in mesic pockets. Very few "mature" trees (diameter > 18") can be found but it does average more than 2,000 bd/ac.”*

Under analysis, the **overstory** consists of occasional medium (1.2/ac), and small (33/ac) sawlog trees. The overstory stems are 40% black cherry, 24% mixed oak, 13% each red and sugar maple, and the remainder in **ailanthus**, elm, and white pine. About 73% of the overstory stems are acceptable growing stock.

The **middle story** consists of pole sized (183/ac) trees. The stems are 47% mixed oak, 28% black cherry, with the remainder in sugar maple, red maple, hickory, black locust, black walnut, and birch. About 74% of the middle story stems are acceptable growing stock.

The **understory** consisted of saplings (446/ac), and invasive species. The saplings are about 42% chestnut oak, 21% red oak, 10% each red and sugar maple, and the remainder in ironwood and black oak. About 78% of the understory saplings are judged as acceptable growing stock.

The **soils in stand 2** are a mix of Weikert channery silt loam, Hazelton-Clymer association, Buchanan cobbly loam, Klinesville and Calvin soils, Dystrocrepts-rock outcrop, Laidig cobbly loam, Albrights silt loam, and Calvin channery silt loam. All are considered well drained, with the exception of the Albrights silt loam which is moderately well drained.

About 20% of the plots indicated adequate regeneration. About 67% of the plots recorded invasive species. About 8% of the plots had **Ailanthus** in the overstory. Ferns were not interfering. Grass was a problem on 42% of the plots and grapevines were a problem on 83% of the plots. Interfering vegetation occurred 50% of the time. Seed source of desirable species is moderate. The acorn supply is rated as inadequate . Deer pressure appears to be moderate. The elevation of the stand is 1120 to 1380 feet above sea level. The area has a general aspect range of 120 and 171 degrees. Slopes of up to 41% exist in the stand.

While complete elimination and total coverage of invasive species is the goal, they are *invasive species*, easily spread by wind, animals, and humans.  Treatments are much more effective and easier to apply if completed prior to any harvest or opening of the canopy. Involving a potential contractor prior to establishing an NRCS contract for invasive removal is encouraged so that all involved parties have a clear understanding of the expected outcomes and costs. Methods of removal may vary but desired levels of population reduction in the management unit should be 80 to 85 percent with each treatment. Follow-up evaluation and repeated treatments should be planned to ensure invasive species are found on no more than 10% of plots, especially if resistant species are present. Continue monitoring invasive species until adequate desirable regeneration has occurred.  If levels rise above 25 percent before regeneration is firmly established, additional treatments may be required.

State code of BC – Black cherry-northern Hardwood Forest, site class 2 – project main stem of 30-40 ft at maturity, and Stocking class 3 - Majority of the dominant and co-dominant trees are 6-12” Dbh and > 50% stocked.

**Landowner Objectives:**

1. Provide education opportunities in natural resource and wildlife management
2. Promote/enhance flora and fauna biodiversity on the property
3. Follow scientifically-based forestry practices to meet stand-level objectives Overall notes of the property and history:

**Management Recommendations**:

1. When out of control, exotic invasive vegetation can prevent the development of desirable seedlings and native shrubs**. Remove Ailanthus** from the overstory using an **herbicide application** (August-September) to prevent roots resprouting. An effort should be made to identify the worst patches of **exotic shrubs** **and herbaceous vegetation** (multiflora rose, barberry, stiltgrass, garlic mustard) and kill them by **herbicide application**. Scattered exotics should also be treated as far as is logistically practical. Stilt grass and garlic mustard should be controlled along trails, streams, and in openings to the fullest extent possible. Patches of stilt grass should be obvious even when it is not green. After removing large patches of stiltgrass, reseed bare soil with a **pollinator** mix to prevent/control resurrection of the stiltgrass.

2. Silvah has recommended **a pre-commercial thinning or defer harvesting. Grapevines (83%) should be controlled regardless of harvest decision**. Relative stand density is 90 percent of the average maximum stocking expected in undisturbed stands of similar size and species composition. This density is higher than optimum for best individual tree growth. At this relative density, growth rate of the biggest trees is probably moderate, while growth rate of the medium and smaller-sized trees is probably fair and mortality due to crowding moderate. Thinning to provide more growing space for the better stems is desirable if it will at least pay the cost of harvesting.

Keep in mind the **PNDI conservation measures** if considering any harvesting.

Again, with more than 2800 bf/ac in the stand, consider **enrolling in a carbon program**. Two programs are listed in the Carbon Sequestration section above.

All harvesting should be followed up by **regrading of roadways**, **seeding roads** with legumes to control erosion and benefit wildlife.

3. If collecting firewood or removing poorly formed trees to grow mushrooms in the stand, utilize **crop tree release** considerations outlined in Appendix VI.

**Mgt Unit: Stand 3 Acres: 29.7 (Forest Type, Size, Stocking: AH23)**

**Description: “***Stand 3 is xeric and resembles a lot of stand 1 with its topography but with a completely different species mixture. Mixed-oak species dominate this site and it should be no surprise with its southern to southwest facing slope. This area was subjected to some harvesting activity but it was not extensive due to the steep slopes and inaccessibility.”*

Under analysis, the **overstory** consists of occasional large (0.3/ac), medium (2.5/ac), and small (24/ac) sawlog trees. The stems are 47% mixed oak, 34% white pine, and the remainder in red maple, hickory, and ash. About 89% of the overstory stems are acceptable growing stock.

The **middle story** consists of about 175/ac pole size trees. The pole stems are about 66% mixed oak, 14% black cherry. 11% red maple, and the remainder in white pine, sugar maple, and hickory. About 88% of the mid-story stems are acceptable growing stock.

The **understory** consisted of saplings (235/ac) and invasive species. The saplings are 60% chestnut oak, 10% red oak, and the remainder in black cherry, red maple, sugar maple, and ironwood. About 85% of the understory saplings are judged as acceptable growing stock.

The **soils in stand 3** are a mix of Buchanan cobbly loam, Klinesville and Calvin soils, Dystrocrepts-rock outcrop, Laidig cobbly loam, Allegheny loam, and Klinesville-rock outcrop complex. All are considered well drained.

About 20% of the plots indicated adequate regeneration. About 17% of the plots recorded invasive species. Interfering ferns and grasses were not a problem. Grapevines were a problem on 17% of the plots. Interfering vegetation was a problem on 50% of the plots. Seed source of desirable species is low. The acorn supply is rated as ‘some’. Deer pressure appears to be moderate. The elevation of the stand is 980 to 1250 feet above sea level. The area has a general aspect range of 130 to 240 degrees. Slopes of up to 50% exist in the stand.

While complete elimination and total coverage of invasive species is the goal, they are *invasive species*, easily spread by wind, animals, and humans.  Treatments are much more effective and easier to apply if completed prior to any harvest or opening of the canopy. Involving a potential contractor prior to establishing an NRCS contract for invasive removal is encouraged so that all involved parties have a clear understanding of the expected outcomes and costs. Methods of removal may vary but desired levels of population reduction in the management unit should be 80 to 85 percent with each treatment. Follow-up evaluation and repeated treatments should be planned to ensure invasive species are found on no more than 10% of plots, especially if resistant species are present. Continue monitoring invasive species until adequate desirable regeneration has occurred.  If levels rise above 25 percent before regeneration is firmly established, additional treatments may be required.

State code of AH – Dry Oak-heath Forest, site class 2 – project main stem of 30-40 ft at maturity, and Stocking class 3 - Majority of the dominant and co-dominant trees are 6-12” Dbh and > 50% stocked.

**Landowner Objectives:**

1. Provide education opportunities in natural resource and wildlife management
2. Promote/enhance flora and fauna biodiversity on the property
3. Follow scientifically-based forestry practices to meet stand-level objectives Overall notes of the property and history:

**Management Recommendations**:

1. When out of control, exotic invasive vegetation can prevent the development of desirable seedlings and native shrubs. An effort should be made to identify the worst patches of **exotic shrubs and herbaceous vegetation** (barberry, stiltgrass, garlic mustard) and kill them by **herbicide application**. Scattered exotics should also be treated as far as is logistically practical. Stilt grass should be controlled along trails and in openings to the fullest extent possible. Patches of stilt grass should be very obvious even when it is not green.

After removing large patches of stiltgrass, reseed bare soil with a **pollinator** mix to prevent/control resurrection of the stiltgrass.

2. Silvah has recommended **a pre-commercial thinning or defer harvesting**. Relative stand density is 87 percent of the average maximum stocking expected in undisturbed stands of similar size and species composition. This density is higher than optimum for best individual tree growth. At this relative density, growth rate of the biggest trees is probably moderate, while growth rate of the medium and smaller-sized trees is probably fair and mortality due to crowding moderate. Thinning to provide more growing space for the better stems is desirable if it will at least pay the cost of harvesting.

Keep in mind the **PNDI conservation measures** if considering any harvesting.

Again, with 3,100 bf/ac, this stand could be a good candidate for **enrolling in a carbon program** but its inaccessibility may lend itself to disqualification. It may be worthwhile to attempt enrollment in a carbon program**.** Two programs are listed in the Carbon Sequestration section above.

All harvesting should be followed up by **regrading of roadways**, **seeding roads** with legumes to control erosion and benefit wildlife.

3. If collecting firewood or removing poorly formed trees to grow mushrooms in the stand, utilize **crop tree release** considerations outlined in Appendix VI.

**Mgt Unit: Stand 4 Acres: 7.4 (Forest Type, Size, Stocking: FA22)**

**Description: “***Stand 4 was borderline to being delineated or just lumped into stand 2. Normally, microsites that are less than 10 acres do not separate out and identified as stands. Nonetheless, it is a very distinct area given its surroundings. This stand appears to have been largely spared from the large commercial harvest, likely because markets for white pine are historically less attractive compared to PA hardwoods.”*

Under analysis, the **overstory** consists of occasional large (1.1/ac), medium (9.3/ac), and small (35/ac) sawlog trees. The stems are 94% white pine, and the remainder in red oak. About 91% of the overstory stems are acceptable growing stock.

The **middle story** consisted of pole sized trees (97/ac). The stems are about 55% chestnut oak, 38% red oak, and the remainder in white pine. About 55% of the mid-story saplings are judged as acceptable growing stock.

The **understory** consisted of saplings (310/ac), huckleberry, and invasive species. The saplings are about 45% chestnut oak, 30% black gum, and the remainder in birch. Only 54% of the understory saplings are judged as acceptable growing stock.

The **soils in stand 4** are entirely Klinesville and Calvin soils and considered well drained.

About 20% of the plots indicated adequate regeneration. None of the plots recorded invasive species. Ferns were not interfering. Grass and grapevines were not a problem. Interfering vegetation was negligible. Seed source of desirable species is very low. The acorn supply is rated as inadequate. Deer pressure appears to be moderate. The elevation of the area is 1180 to 1320 feet above sea level. The area has a general aspect range of 30 degrees through north to 235 degrees. Slopes of up to 40% exist in the area.

While complete elimination and total coverage of invasive species is the goal, they are *invasive species*, easily spread by wind, animals, and humans.  Treatments are much more effective and easier to apply if completed prior to any harvest or opening of the canopy. Involving a potential contractor prior to establishing an NRCS contract for invasive removal is encouraged so that all involved parties have a clear understanding of the expected outcomes and costs. Methods of removal may vary but desired levels of population reduction in the management unit should be 80 to 85 percent with each treatment. Follow-up evaluation and repeated treatments should be planned to ensure invasive species are found on no more than 10% of plots, especially if resistant species are present. Continue monitoring invasive species until adequate desirable regeneration has occurred.  If levels rise above 25 percent before regeneration is firmly established, additional treatments may be required.

State code of FA – Dry white pine-oak forest, site class 2 – project main stem of 30-40 ft at maturity, and Stocking class 2 - Majority of the dominant and co-dominant trees are 12-18” Dbh and > 50% stocked.

**Landowner Objectives:**

1. Provide education opportunities in natural resource and wildlife management
2. Promote/enhance flora and fauna biodiversity on the property
3. Follow scientifically-based forestry practices to meet stand-level objectives Overall notes of the property and history:

**Management Recommendations**:

1. No interfering vegetation was identified in the inventory process. Silvah has recommended **defer harvesting due to low density (79%)**. However, the density is just below the 80% decision point and **a thinning may be appropriate.**

Keep in mind the **PNDI conservation measures** if considering any harvesting.

All harvesting should be followed up by **regrading of roadways**, **seeding roads** with legumes to control erosion and benefit wildlife.

2. Again, with over 6,400 bf/ac, consider **enrolling in a carbon program**. Two programs are listed in the Carbon Sequestration section above. .

3. . If collecting firewood or removing poorly formed trees to grow mushrooms in the MU, utilize **crop tree release** considerations outlined in Appendix VI.

**Mgt Unit: Stand 5 Acres: 116.4 (Forest Type, Size, Stocking: AH23)**

**Description:** “*Stand 5 is the largest stand on the property and is largely dominated by mixed-oak species. The growing site appears to be a little poorer as a majority of the stems are still allocated in the small-poletimber size class. It also has a western-facing slope so it gets a lot of the afternoon sun. There are a few different ways to possibly manage this stand, one being more "passive" and the other being very engaged. Since its carbon potential is low, recommend managing/manipulating this forest through timber harvests. Please note that stocking levels are close to reaching 100%, on average.”*

Under analysis, the **overstory** consists of small (3.7/ac) sawlog and (186/ac) pole sized trees. The stems are 62% mixed oak- mostly chestnut and red oaks, and the remainder in Virginia pine, red maple, hickory, birch, white pine, and black cherry. About 93% of the overstory stems are acceptable growing stock.

There is no **middle story**.

The **understory** consisted of saplings (558/ac) and invasive species. The saplings are 31% chestnut oak, 23% red oak, 10% dogwood, and the remainder in white oak, Virginia pine, red maple, hickory, birch, black gum, scarlet oak, sugar maple, and serviceberry. About 76% of the understory saplings are judged as acceptable growing stock.

The **soils in stand 5** are a mix of Beddington-Berks complex, Berks channery silt loam, Blairton channery silt loam, Weikert channery silt loam, and Atkins-Ernest complex. Most are considered well drained. The exceptions are Blairton silt loam (moderately well drained) and Atkins-Ernest complex (poorly drained).

About 20% of the plots indicated adequate regeneration. About 38% of the plots recorded invasive species. Ferns and grasses were not interfering. Grapevines were not a problem. Interfering vegetation occurred 19% of the time. Rocky conditions were found on 13% of the plots. Seed source of desirable species is very low. The acorn supply is rated as inadequate. Deer pressure appears to be moderate. The elevation of the stand is 1020 to 1380 feet above sea level. The area has a general aspect range of 255 through 285 degrees. Slopes of up to 29% exist in the stand.

While complete elimination and total coverage of invasive species is the goal, they are *invasive species*, easily spread by wind, animals, and humans.  Treatments are much more effective and easier to apply if completed prior to any harvest or opening of the canopy. Involving a potential contractor prior to establishing an NRCS contract for invasive removal is encouraged so that all involved parties have a clear understanding of the expected outcomes and costs. Methods of removal may vary but desired levels of population reduction in the management unit should be 80 to 85 percent with each treatment. Follow-up evaluation and repeated treatments should be planned to ensure invasive species are found on no more than 10% of plots, especially if resistant species are present. Continue monitoring invasive species until adequate desirable regeneration has occurred.  If levels rise above 25 percent before regeneration is firmly established, additional treatments may be required.

State code of AH – Dry oak-heath Forest, site class 2 – project main stem of 30-40 ft at maturity, and Stocking class 3 - Majority of the dominant and co-dominant trees are 6-12” Dbh and > 50% stocked.

**Landowner Objectives:**

1. Provide education opportunities in natural resource and wildlife management
2. Promote/enhance flora and fauna biodiversity on the property
3. Follow scientifically-based forestry practices to meet stand-level objectives Overall notes of the property and history:

**Management Recommendations**:

1. When out of control, exotic invasive vegetation can prevent the development of desirable seedlings and native shrubs. An effort should be made to identify the worst patches of **exotic shrubs and herbaceous vegetation** (multiflora rose, barberry, stiltgrass, garlic mustard) and kill them by **herbicide application**. Scattered exotics should also be treated as far as is logistically practical. Stilt grass should be controlled along trails and in openings to the fullest extent possible. Patches of stilt grass should be very obvious even when it is not green.

After removing large patches of stiltgrass, reseed bare soil with a **pollinator** mix to prevent/control resurrection of the stiltgrass.

2. Silvah has recommended **a pre-commercial thinning or defer harvesting due to low volume.** However, relative stand density is 95 percent of the average maximum stocking expected in undisturbed stands of similar size and species composition. This density is higher than optimum for best individual tree growth. At this relative density, growth rate of the biggest trees is probably moderate, while growth rate of the medium and smaller-sized trees is probably fair and mortality due to crowding moderate. Thinning to provide more growing space for the better stems is desirable if it will at least pay the cost of harvesting.

One way of accomplishing a light thinning is to use **crop tree release methods** (Appendix VI) to select small trees for removal to be utilized **for growing of mushrooms or firewood** - promoting the growth of dominant/codominant mixed-oak stems.

**OR**

**Early Successional Habitat (ESH) Development**. If the ESH is conducted on the whole stand, a fence is not needed. However, if the manager does not wish to conduct the ESH on all the acres, recommend a **deer fence installation on anything less than 45 acres in size.**

Keep in mind the **PNDI conservation measures** if considering any harvesting.

This stand does not have sufficient volume to qualify for **enrolling in a carbon program**.

Any harvesting should be followed up by **regrading of roadways**, **seeding roads** with legumes to control erosion and benefit wildlife.

**Mgt Unit: Stand 6 Acres: 26.8 (Forest Type, Size, Stocking: BB22)**

**Description:** “*Stand 6 is an Allegheny/northern hardwood stand that has a mixture of species. Being a borderline small-sawtimber stand, its seed potentials may be adequate but certainly not plentiful for a shelterwood seed cut or any other regeneration methods at this time.”*

Under analysis, the **overstory** consists of occasional medium (2.9/ac), and small (41/ac) sawlog trees. The stems are 22% sugar maple, 17% each hickory and red oak, 11% red maple, 10% each black oak and black cherry, and the remainder in white pine and elm. About 93% of the overstory stems are acceptable growing stock.

The **middle story** consists of about 54/ac pole size trees. The pole stems are about 48% sugar maple, 25% black cherry, 15% red maple, and the remainder in hickory and white pine. About 71% of the mid-story stems are acceptable growing stock.

The **understory** consisted of saplings (44/ac) and invasive species. The saplings are about 44% serviceberry, and the remainder split evenly between sugar maple and black cherry. About 44% of the understory saplings are judged as acceptable growing stock.

The **soils in stand 6** are a Weikert channery silt loam (well drained) and Atkins-Ernest complex (poorly drained).

None of the plots indicated adequate regeneration. About 17% of the plots recorded invasive species. Ferns were interfering on 33% of the plots. Grasses were interfering on 17% of the plots. Grapevines were not a problem. Interfering vegetation occurred 50% of the time. Seed source of desirable species is moderate. The acorn supply is rated as inadequate. Deer pressure appears to be moderate. The elevation of the stand is 1020 to 1150 feet above sea level. The area has a general aspect of 203 degrees. Slopes of up to 13% exist in the stand.

While complete elimination and total coverage of invasive species is the goal, they are *invasive species*, easily spread by wind, animals, and humans.  Treatments are much more effective and easier to apply if completed prior to any harvest or opening of the canopy. Involving a potential contractor prior to establishing an NRCS contract for invasive removal is encouraged so that all involved parties have a clear understanding of the expected outcomes and costs. Methods of removal may vary but desired levels of population reduction in the management unit should be 80 to 85 percent with each treatment. Follow-up evaluation and repeated treatments should be planned to ensure invasive species are found on no more than 10% of plots, especially if resistant species are present. Continue monitoring invasive species until adequate desirable regeneration has occurred.  If levels rise above 25 percent before regeneration is firmly established, additional treatments may be required.

State code of BB – Northern hardwood Forest, site class 2 – project main stem of 30-40 ft at maturity, and Stocking class 2 - Majority of the dominant and co-dominant trees are 12-18” Dbh and > 50% stocked.

**Landowner Objectives:**

1. Provide education opportunities in natural resource and wildlife management
2. Promote/enhance flora and fauna biodiversity on the property
3. Follow scientifically-based forestry practices to meet stand-level objectives Overall notes of the property and history:

**Management Recommendations**:

1. When out of control, exotic invasive vegetation can prevent the development of desirable seedlings and native shrubs. An effort should be made to identify the worst patches of **exotic shrubs and herbaceous vegetation** (barberry, multiflora rose, stiltgrass, garlic mustard) and kill them by **herbicide application**. Scattered exotics should also be treated as far as is logistically practical. Stilt grass should be controlled along trails and in openings to the fullest extent possible. Patches of stilt grass should be very obvious even when it is not green.

After removing large patches of stiltgrass or ferns, reseed bare soil with a **pollinator** mix to prevent/control resurrection of the stiltgrass.

**Monitor seedlings 3 to 5 years** after exotic and interfering vegetation is controlled.

2. Silvah has recommended **an herbicide application.** Density is low enough (54%) that regeneration should occur once interfering vegetation is controlled**.**

Keep in mind the **PNDI conservation measures** if considering any harvesting.

One way of accomplishing a light thinning is to use **crop tree release methods** to select small trees for removal and to be utilized **for growing of mushrooms**.

Again, with over 3,800 bf/ac, consider **enrolling in a carbon program**. Two programs are listed in the Carbon Sequestration section above.

Any harvesting should be followed up by **regrading of roadways**, **seeding roads** with legumes to control erosion and benefit wildlife.

3. . If collecting firewood or removing poorly formed trees to grow mushrooms in the stand, utilize **crop tree release** considerations outlined in Appendix VI.

**Forest Harvesting Activities** **Worksheet**

**For CAP 106 and ATFS participants only** (not participants in the Forest Stewardship Program**), this sheet must be completed prior to conducting any timber harvesting on the property, and submitted to the local DCNR Service Forester.** All MUs in the treatment area must be listed on this document. If Landowner has indicated participation in the Forest Stewardship Program (Signature Page), a stand analysis and prescription for the activity are required as indicated.

**MUs as indicated in management activity schedule below**

**Silviculture and Harvesting Treatments**: The intent of **early succession habitat** creation is to identify and retain 10-25 trees per acre clearing all other trees/shrubs to promote habitat for species of concern. A **Liberation cut** is useful in rehabilitating a degraded MU. It entails removing older, less desirable trees that are over-topping desirable young trees to ensure adequate sunlight for planted seedlings. Implement this practice by cutting or killing undesirable and poor-quality trees from all canopy positions until the relative density of the MU is less than 20 percent. The intent of a **crop tree release** is to identify and release 25 – 40 crop trees per acre within the MU. The intent of a **Commercial Thinning** is to improve the overall MU structure and health, promote regeneration, and promote mast producing species. The intent of a **Shelterwood first cut** is to reduce the canopy cover to 60% or less to allow regeneration of the MU to occur. Control competing herbaceous and woody vegetation prior to creation of any openings and for 100 ft into the forest from any thinning or harvest edge.

1. Exercising care to avoid contamination of any streams, control competing **herbaceous vegetation** (i.e., non-native invasive species) by chemical spraying.

2. Control competing low/high interfering understory **brush vegetation** (i.e., spicebush, birch, beech, devil’s walking stick, striped maple, grapevines, green briar, serviceberry, black gum, witch hazel, black locust, sassafras, invasive species) by either chemical basal spray or mechanical means.

3. Conduct a **harvest treatment as described above and in the action plan** to release crop trees, improve MU structure and health, regeneration, and promote mast producing species. At time of thinning, remove undesirable species, excess saplings/poles from MU, and create snags.

4. After every harvest operation, rework skid trails and landings -

5. Replant trails and landings with legumes **– Critical area plantings**

**Best Management Practices for Timber Harvesting**: (Consider BMPs for slash disposal, water quality, soil stabilization, wildlife, nutrient cycling, erosion and sedimentation, etc.

Establish a buffer zone along permanent streams to maximize shade from remaining trees and minimize siltation of the stream. Establish temporary crossings at the seasonal rivulets through the area. Keep skid trail inclines to between 3 and 7% to promote drainage and minimize erosion. Use sufficient water bars to deflect runoff from eroding trails/roads. Cut slash to less than 6 ft in height. Slash provides low cover for wildlife and shields regeneration from deer impact. Bumper trees should be utilized to protect any residual timber from skidding damage. In thinning operations, retain seed source trees as residuals to promote natural regeneration. Avoid harvesting timber during the growing months when residual trees are most susceptible to damages. Avoid high-grading the forest. Ensure that a MU compatible with long-term management objectives remains after intermediate treatments. Instead of selecting for cutting, select for retention trees that are species adapted to the site, not likely to develop *epicormic branching* from exposure to increased sunlight, and properly spaced. Replant skid trails with legumes when logging activities are finished to prevent erosion and benefit wildlife. Reduce deer pressure through hunting or fencing.

**Permits:** (List permits applied for and needed.)

Permits may include an **Erosion and Sedimentation** permit from the **Bedford County Conservation District**. Their website is [www.bedfordcountyconservation.com](http://www.bedfordcountyconservation.com) . You may contact Jennifer Lentz Kovacs, District Manager, at 702 West Pitt Street, Fairlawn Court, Suite 4, Bedford, PA 15522. Phone – 814.623.8099. The website has a special package of guidance for timber harvesting.

Any stream crossings (greater than a 100-acre watershed) may require a separate permit.

Contact the **Hopewell Township** (2759 Raystown Rd, Hopewell PA 16650 Phone: (814) 652-5743), or **PennDOT** for road bonding and temporary driveway issues when planning access routes for harvesting activities.

**JUNIATA COLLEGE - BEDFORD MANAGEMENT ACTIVITY SCHEDULE AND TRACKING**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **MU/ Field in priority order** | **Acres / feet** | **Priority** | **Recommended activities** | **NRCS Program / activity code** | **Plan Date** | **Complete Date** | **Incentive Payment used?** |
| All stands | 338 ac | 1 | For tax purposes, **establish a basis** value for timber when acquired. Record on IRS Form T. |  | 2023 |  |  |
| All stands | 338 ac | 1 | **Monitor for** and control **forest pest infestations** |  | 2023 -2038 |  |  |
|  |  |  | **Acreage for treatment was arrived at by multiplying the percentage of sample plots needing treated by the acreage of the stands. Actual acreage could be higher or lower. Multi-year treatments may be required to effectively control invasive species.** |  |  |  |  |
| Stand 2 | 7 ac | 1 | **Remove Ailanthus** from the overstory | 666 | 2023 2024 2025 |  |  |
| Stand 1 medium  Stand 2 medium  Stand 3 medium  Stand 5 light  Stand 6 medium | 30 ac  35 ac  10 ac  Not known ac  13 ac | 1 | **Herbaceous vegetation management** - Control interfering herbaceous vegetation (i.e., applicable non-native invasive species, grasses) by foliar and/or pre-emergent **herbicide application**. | 315 | 2023  2024  2025 |  |  |
| Stands 1, 2, 3, 5, 6 | 44 ac | 1 | **Reseed with a pollinator mix** where stiltgrass/garlic mustard is removed. | 327/420 | 2023 2024 2025 |  |  |
| Stand 1 medium  Stand 2 medium  Stand 3 medium  Stand 5 medium  Stand 6 medium | 45 ac  67 ac  5 ac  39 ac  5 ac | 1 | **Brush management** – control competing low/high interfering understory vegetation (i.e., applicable non-native invasive species, grapevines, undesirable poles and saplings) by basal spray **herbicide application**. See Activity Worksheet for more info. | 314 | 2023  2024  2025 |  |  |
| Stands 1, 2, 3, 4, 6 | 222 ac | 1 | **Consider enrollment in a carbon program**. Get paid to let the trees grow. |  | 2023-2043 |  |  |
| Stand 6 | 27 ac | 1 | **Monitor regeneration** 3-5 years after herbicide | 645 | 2026-2028 |  |  |
| Stands 2, 3, and 5 | 230 ac | 1 | **Timber stand improvement – pre comm thinning. I**f cutting trees for non-timber forest products, utilize **crop tree release** methods. Consult with forester if enrolled in carbon program.  **OR for stand 5** | 666 | 2026-2045 |  |  |
| Stand 5 | 116 ac | 2 | **Establish Early Successional Habitat.** If less than 45 ac in a single year, use **deer exclusion fence.** Consult with forester if enrolled in carbon program. This could eliminate stand from carbon program. | 647/382/ 612 | 2026- 2045 |  |  |
| All stands | 338 ac | 1 | **Reevaluate** forest MU for additional management options. | 106 | 2042 |  |  |

**APPENDIX I**

The below information is to assist the landowner in learning more about specific recommendations in the plan, and reaching their goals. The DCNR Service Forester or NRCS representative may be able to provide information to assist as well.

**Property Tax Reductions**- If not already enrolled, the landowner should consider the PA Clean and Green Act and the local property tax benefits of enrolling tracts greater than 10 acres in the program. The County Conservation District should be able to assist in this effort.

**Income Tax reduction**-

A **Tax credit** is available for reforestation efforts.

Capital gains taxes are usually less than ordinary income taxes. In order to minimize taxes incurred through a timber sale, the landowner **must establish a basis** for the value of the timber when he purchased it. The difference between the basis and the sale price is called the **capital gain** and is subject to capital gain taxes which are less than regular income tax levels. If no basis is established, the entire sale amount becomes a taxable capital gain. There may be assistance to control tax liability available to forest landowners who are administering a Forest Management Plan. A website with information on taxes is available at [www.timbertax.org](http://www.timbertax.org). Another site with good tax guidance is <http://blogs.cornell.edu/cceforestconnect/> which connects forest owners in information sharing.

**Record Keeping**- Good record keeping can assist forest landowners minimize tax liability, increase revenues from sale of products, and better manage forest assets. Establishing basis and keeping records of all costs incurred and realized income in land management activities can assist in better decision making. IRS Form T (Timber) is available at [www.irs.gov/pub/irs-pdf/ft.pdf](http://www.irs.gov/pub/irs-pdf/ft.pdf) and should be maintained for tax purposes.

**Land Use Status**- unknown

**Conservation Easements information** - Local Land Trusts use Conservation Easements to protect Working Forest resources. These ensure the Land Trust values are applied to the working forest and conservation, rather than a hands-off preservation easement.

**Local Woodland Owner Associations Information** – See Professional Assistance section of document.

**Timber Market information** is available at <http://extension.psu.edu/natural-resources/forests/timber-market-report>

**Historical aerial photos** may be available for downloading at <https://datacommons.maps.arcgis.com/apps/View/index.html?appid=10af5f75f9f94f01866359ba398cb6a9>

**Game Management information -** Consult the PA Game Commission or a wildlife consultant for additional information. Contact information is listed in the Professional Assistance section of the plan.

**APPENDIX II**

**Please find supporting plan documentation information.**

1. Forest Harvesting Activities-Additional Sheet

2. Stand Level Reconnaissance Data and Information Sheets

**Forest Harvesting Activities** **Worksheet**

**For CAP 106 and ATFS participants only (**not participants in the Forest StewardshipProgram**), this sheet must be completed prior to conducting any timber harvesting on the property, and submitted to the local DCNR Service Forester**. All stands in the treatment area must be listed on this document. If Landowner has indicated participation in the Forest Stewardship Program (Signature Page), a stand analysis and prescription for the activity are required as indicated.

**Stand # (‘s)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Silviculture and Harvesting Treatments**: (Describe type of treatment to be undertaken, along with goals and intended outcomes. Treatment type could be even aged, multi aged, salvage, intermediate treatment, cleaning, pulpwood, etc. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Best Management Practices for Timber Harvesting**: (Consider BMPs for slash disposal, water quality, soil stabilization, wildlife, nutrient cycling, erosion and sedimentation, etc.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Permits:** (List permits applied for and needed.)

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**STAND LEVEL RECONNAISANCE DATA**

Landowner:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Stand #\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Acres\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_

Slope: Flat Gentle Moderate Steep Aspect: N NE E SE S SW W NW top

Soils: **Drainage** (VP-Very Poor, P-Poor, SP-Somewhat Poor, MW-Moderate Well, W-Well,

VW-Very Well)

Series and Type\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Drainage\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Series and Type\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Drainage\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Series and Type\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Drainage\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Management History:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

OVERSTORY CONDITIONS:

Dominant Forest Type: (Type, Site, Size, Stocking classes, Comm.-Non-Comm.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Quality Timber Crop Potential: Poor Fair Good Very Good Excellent

Insect and Disease Problems Past and Present:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

UNDERSTORY CONDITIONS:

Common Trees, Shrubs, and Herbaceous Plants\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Non-Native and Native Invasive Spp.:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Commercial Tree Regeneration Spp.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Regeneration Density: Patchy Sparse Moderate Abundant

Deer Impact: Very Low Low Moderate High Very High

WILDLIFE HABITAT:

ESTIMATED # LIVE AND DEAD CAVITY TREES/ACRE AND SNAGS.

1. Live with hole smaller than 5”\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Live with hole larger than 5”\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Dead with cavity\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Standing dead snags\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

ESTIMATED COARSE WOODY DEBRIS/ACRE:

1. # Logs/Branches <12” Diameter\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. # Logs/Branches >12” Diameter\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

NATIVE MIDSTORY COVER: <25% 25-50% 50-75% >75%

ESTIMATED BRUSHPILES/DOWNED TREETOPS/ACRE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

HARD MAST (e.g., from oaks, walnut, beech, maples, pines, ash, etc.)

1. None Sparse Moderate Abundant

SOFT MAST (e.g., from cherries, black gum, dogwood, sassafras, serviceberry, crabapple, hawthorn, viburnums, spicebush, blueberry, others)

1. None Sparse Moderate Abundant

LOW EVERGREEN COVER (ground level to 10’ height)

1. Species Present\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, None Sparse Moderate Abundant

HIGH EVERGREEN COVER (taller than 10’ height)

1. Species Present\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, None Sparse Moderate Abundant

WATER FEATURES AND ECOLOGICALLY SENSITIVE SITES: (stream buffers, spring seeps, boulders, rock cliffs, wolf trees, rare wildflowers, vernal ponds, beaver dams, bird rookery, non-timber forest products, etc.\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

AESTHETICS: (fall color, vistas or creation thereof, unique trees, wildflower areas, etc.)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

RECREATION: (existing trails or opportunities, waterways, birdwatching, types of motorized or passive recreation opportunities related to landowner goals, etc.)

**STAND LEVEL INFORMATION SHEET**

**Stand #: \_\_\_\_\_ Acres: \_\_\_\_\_Forest Type, Size, Stocking: \_\_\_\_\_\_\_\_\_\_\_\_**

**Stand Descriptions:** (information to include tree species present/forest type, stand age, history, site index, elevation, slope, size class, stocking, regeneration, invasive species, deer pressure, approximate basal area, wildlife habitat features, etc.)

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**Landowner Objectives for Stand:**



**Stand Management Recommendations**:

**(**Consider landowner goals, timber harvesting, TSI, invasive control, wildlife habitat creation, recreation, water quality enhancements, and desired future stand condition.)**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**APPENDIX III**

**Please find attached documents**

1. Report of PNDI Search results with conservation measure.
2. Request for desk audit

**APPENDIX IV**

**Please find attached maps.**

1. Historical aerial photographs

2. Property map with MUs and parcels indicated

Property topographic maps

Property aerial photographs

3. Soil maps and report

**APPENDIX V**

**Technical Analysis of Mgt Units -** *In accordance with guidance from P. Hoagland, PA NRCS coordinator, complete Silvah analysis reports are provided only in soft copy to conserve paper. A spreadsheet with pertinent data on all MUs is included in hard copy.*

## Stand 1 - Narrative Summary and Analysis (2021 inventory data)

Nonnative invasive species have the potential to displace native vegetation, including desirable timber species. There were no invasives in the overstory, two invasives in the understory (Japanese barberry and garlic mustard), and three that were found outside the plots (ailanthus, oriental bittersweet and Japanese stiltgrass).

This Mesic Hardwood stand is dominated by Sugar Maple, Chestnut Oak, Red Maple, Hickory, Black Cherry, Red Oak and which together comprise 87 percent of the basal area. This is a small sawtimber stand, with average medial diameter of 11.0 inches. If this stand is managed under an even-age silvicultural system, the several species groups will mature at markedly different times. The average time to maturity (MDM = 18 inches) is 34 years. Effective stand age is about 74 years. If this stand is managed under an all-age silvicultural system, the distribution of diameters, proportion of sawtimber, and density of shade-tolerant species are adaptable to selection cutting.

Relative stand density is 63 percent of the average maximum stocking expected in undisturbed stands of similar size and species composition. This density is in the optimum range for best individual tree growth. At this relative density, growth rate of the biggest trees is probably excellent, while growth rate of the medium and smaller-sized trees is probably good and mortality due to crowding low. Thinning to provide more growing space for the better stems is not necessary at this time.

Total growing stock amounts to 82 sq. ft. of basal area per acre. Net total volume in all trees, to a 4-inch top, is 15.6 cords per acre; if divided into pulpwood and sawtimber, the net merchantable volume is 10.7 cords of pulp wood and 3160.8 board feet of sawtimber (International 1/4 inch log rule). Trees of acceptable quality for future growing stock provide enough stocking by themselves to warrant stand management.

Competitive regeneration of all types is insufficient; harvest cuttings at this time will not likely result in a satisfactory new stand. Undesirable understory plants may interfere with development of regeneration. Undesirable plants in this stand include dense low woody cover, dense tall woody cover and dense grass cover.

## Stand 2 - Narrative Summary and Analysis (2021 inventory data)

Nonnative invasive species have the potential to displace native vegetation, including desirable timber species. There was one invasive in the overstory (ailanthus), one invasive in the understory (Japanese barberry), and four that were found outside the plots (ailanthus, garlic mustard, Japanese stiltgrass and multiflora rose).

This Mesic Hardwood stand is dominated by Black Cherry, Red Oak, Chestnut Oak, Sugar Maple, Red Maple and Hickory which together comprise 89 percent of the basal area. This is a large poletimber stand, with average medial diameter of 9.1 inches. Sapling trees too small to be merchantable represent a significant proportion of stand stocking and should be included in any thinnings. If this stand is managed under an even-age silvicultural system, the several species groups will mature at markedly different times. The average time to maturity (MDM = 18 inches) is 42 years. Effective stand age is about 59 years. If this stand is managed under an all-age silvicultural system, the distribution of diameters, proportion of sawtimber, and density of shade-tolerant species are adaptable to selection cutting.

Relative stand density is 90 percent of the average maximum stocking expected in undisturbed stands of similar size and species composition. This density is higher than optimum for best individual tree growth. At this relative density, growth rate of the biggest trees is probably moderate, while growth rate of the medium and smaller-sized trees is probably fair and mortality due to crowding moderate. Thinning to provide more growing space for the better stems is desirable if it will at least pay the cost of harvesting.

Total growing stock amounts to 122 sq. ft. of basal area per acre. Net total volume in all trees, to a 4-inch top, is 19.3 cords per acre; if divided into pulpwood and sawtimber, the net merchantable volume is 15.0 cords of pulp wood and 2822.9 board feet of sawtimber (International 1/4 inch log rule). Trees of acceptable quality for future growing stock provide a fully stocked stand by themselves.

Competitive regeneration of all types is insufficient; harvest cuttings at this time will not likely result in a satisfactory new stand. Undesirable understory plants may interfere with development of regeneration. Undesirable plants in this stand include dense tall woody cover and dense grass cover.

## Stand 3 - Narrative Summary and Analysis (2021 inventory data)

Nonnative invasive species have the potential to displace native vegetation, including desirable timber species. There were no invasives in the overstory, one invasive in the understory (Japanese barberry), and two that were found outside the plots (garlic mustard and Japanese stiltgrass).

This Mixed Oak stand is dominated by Chestnut Oak, Red Oak, White Pine, White Oak, Black Cherry and Red Maple which together comprise 90 percent of the basal area. This is a large poletimber stand, with average medial diameter of 9.6 inches. Sapling trees too small to be merchantable represent a significant proportion of stand stocking and should be included in any thinnings. If this stand is managed under an even-age silvicultural system, the several species groups will mature at markedly different times. The average time to maturity (MDM = 18 inches) is 41 years. Effective stand age is about 67 years. If this stand is managed under an all-age silvicultural system, the distribution of diameters, proportion of sawtimber, and density of shade-tolerant species would make it difficult to apply selection cutting.

Relative stand density is 87 percent of the average maximum stocking expected in undisturbed stands of similar size and species composition. This density is higher than optimum for best individual tree growth. At this relative density, growth rate of the biggest trees is probably moderate, while growth rate of the medium and smaller-sized trees is probably fair and mortality due to crowding moderate. Thinning to provide more growing space for the better stems is desirable if it will at least pay the cost of harvesting.

Total growing stock amounts to 112 sq. ft. of basal area per acre. Net total volume in all trees, to a 4-inch top, is 18.5 cords per acre; if divided into pulpwood and sawtimber, the net merchantable volume is 13.8 cords of pulp wood and 3102.0 board feet of sawtimber (International 1/4 inch log rule). Trees of acceptable quality for future growing stock provide a fully stocked stand by themselves.

Competitive regeneration of all types is insufficient; harvest cuttings at this time will not likely result in a satisfactory new stand. Undesirable understory plants may interfere with development of regeneration. Undesirable plants in this stand include dense tall woody cover and dense grass cover.

***Stand 4*** *-* **Narrative Summary and Analysis (2021 inventory data)**

Nonnative invasive species have the potential to displace native vegetation, including desirable timber species. None were recorded in or near this stand during the 2021 inventory data. .

This Northern Conifer stand is dominated by White Pine and Chestnut Oak which together comprise 81 percent of the basal area. This is a small sawtimber stand, with average medial diameter of 11.8 inches. Sapling trees too small to be merchantable represent a significant proportion of stand stocking and should be included in any thinnings. If this stand is managed under an even-age silvicultural system, the several species groups will mature at markedly different times. The average time to maturity (MDM = 18 inches) is 28 years. Effective stand age is about 88 years. If this stand is managed under an all-age silvicultural system, the distribution of diameters, proportion of sawtimber, and density of shade-tolerant species would make it difficult to apply selection cutting.

Relative stand density is 79 percent of the average maximum stocking expected in undisturbed stands of similar size and species composition. This density is in the optimum range for best individual tree growth. At this relative density, growth rate of the biggest trees is probably excellent, while growth rate of the medium and smaller-sized trees is probably good and mortality due to crowding low. Thinning to provide more growing space for the better stems is not necessary at this time.

Total growing stock amounts to 113 sq. ft. of basal area per acre. Net total volume in all trees, to a 4-inch top, is 22.1 cords per acre; if divided into pulpwood and sawtimber, the net merchantable volume is 12.4 cords of pulp wood and 6416.9 board feet of sawtimber (International 1/4 inch log rule). Trees of acceptable quality for future growing stock provide a fully stocked stand by themselves.

Competitive regeneration of all types is insufficient; harvest cuttings at this time will not likely result in a satisfactory new stand. Neither site limitations nor undesirable understory plants should interfere with regeneration.

***Stand 5******-* Narrative Summary and Analysis (2022 inventory data)**

Nonnative invasive species have the potential to displace native vegetation, including desirable timber species. There were no invasives in the overstory, two invasives in the understory (garlic mustard and Japanese barberry), and two that were found outside the plots (Japanese stiltgrass and multiflora rose).

This Northern Conifer stand is dominated by Chestnut Oak, Red Oak, White Oak, Pine, Red Maple, Hickory, Black Birch and White Pine which together comprise 89 percent of the basal area. This is a small poletimber stand, with average medial diameter of 6.0 inches. Sapling trees too small to be merchantable represent a significant proportion of stand stocking and should be included in any thinnings. If this stand is managed under an even-age silvicultural system, the several species groups will mature at markedly different times. The average time to maturity (MDM = 18 inches) is 64 years. Effective stand age is about 47 years. If this stand is managed under an all-age silvicultural system, the distribution of diameters, proportion of sawtimber, and density of shade-tolerant species would make it difficult to apply selection cutting.

Relative stand density is 95 percent of the average maximum stocking expected in undisturbed stands of similar size and species composition. This density is well above the optimum for best individual tree growth. At this relative density, growth rate of the biggest trees is probably moderate, while growth rate of the medium and smaller-sized trees is probably poor and mortality due to crowding high. Thinning to provide more growing space for the better stems is highly desirable at this time.

Total growing stock amounts to 102 sq. ft. of basal area per acre. Net total volume in all trees, to a 4-inch top, is 6.9 cords per acre; if divided into pulpwood and sawtimber, the net merchantable volume is 6.4 cords of pulp wood and 324.3 board feet of sawtimber (International 1/4 inch log rule). Trees of acceptable quality for future growing stock provide a fully stocked stand by themselves. Non-commercial saplings and poles represent 7 sq. ft. of basal area and may need to be treated prior to final harvest cutting.

Competitive regeneration of all types is insufficient; harvest cuttings at this time will not likely result in a satisfactory new stand. Neither site limitations nor undesirable understory plants should interfere with regeneration.

***Stand 6*** *-* **Narrative Summary and Analysis (2022 inventory data)**

Nonnative invasive species have the potential to displace native vegetation, including desirable timber species. There were no invasives in the overstory, one invasive in the understory (Japanese barberry), and three that were found outside the plots (garlic mustard, Japanese stiltgrass and multiflora rose).

This Mixed Hardwood stand is dominated by Sugar Maple, Black Cherry, Hickory, Red Maple, Red Oak and White Pine which together comprise 89 percent of the basal area. This is a small sawtimber stand, with average medial diameter of 12.6 inches. If this stand is managed under an even-age silvicultural system, the several species groups will mature at markedly different times. The average time to maturity (MDM = 18 inches) is 29 years. Effective stand age is about 79 years. If this stand is managed under an all-age silvicultural system, the distribution of diameters, proportion of sawtimber, and density of shade-tolerant species are adaptable to selection cutting.

Relative stand density is 54 percent of the average maximum stocking expected in undisturbed stands of similar size and species composition. This density is in the optimum range for best individual tree growth. At this relative density, growth rate of the biggest trees is probably excellent, while growth rate of the medium and smaller-sized trees is probably good and mortality due to crowding low. Thinning to provide more growing space for the better stems is not necessary at this time.

Total growing stock amounts to 77 sq. ft. of basal area per acre. Net total volume in all trees, to a 4-inch top, is 17.2 cords per acre; if divided into pulpwood and sawtimber, the net merchantable volume is 11.3 cords of pulp wood and 3840.6 board feet of sawtimber (International 1/4 inch log rule). Trees of acceptable quality for future growing stock provide enough stocking by themselves to warrant stand management.

Competitive regeneration of all types is insufficient; harvest cuttings at this time will not likely result in a satisfactory new stand. Undesirable understory plants may interfere with development of regeneration. Undesirable plants in this stand include dense low woody cover, dense fern cover and dense grass cover.

**APPENDIX VI**

**Please find attached sample documents.**

1. NRCS Job sheets for practice(s) CP 666 - hardwood/softwood crop tree release

2. Sample NRCS Job standards for CP 314, 315, 612, and 666

3. Sustainable Forestry Initiative (SFI) assessment key

Additional NRCS guidance is available at

<https://1drv.ms/u/s!AmSjgJKkVDT48wMItbEvwKWlJF2x?e=obLdg1>

or

<https://efotg.sc.egov.usda.gov> – go to Pennsylvania, under Document Search, select Section IV – Conservation Practice Standards and Support Documents