

# SAVAGE RIVER STATE FOREST ANNUAL WORK PLAN

## FISCAL YEAR 2018



The mark of  
responsible forestry



### SUSTAINABLE FORESTRY INITIATIVE

*Good for you. Good for our forests.®*

SFI-00050



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Savage River State Forest  
FY-18  
Annual Work Plan



**Savage River State Forest  
FY-18 Annual Work Plan**

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Compartment 5 Stands 35, 37, and 38: *60-acre Hardwood Thinning*

Compartment 7 Stand 38: *21-acre Hardwood Thinning*

Compartment 7 Stand 43: *23-acre Hardwood Regeneration*

Compartment 11 Stand 21: *21-acre Hardwood Thinning*

Compartment 13 Stand 6: *31-acre Interfering Understory Vegetation Control*

Compartment 36 Stand 0: *34-acre Hardwood Thinning and Treatment of Interfering Understory Vegetation*

Compartment 37 Stands 23 and 24: *115-acre Hardwood Thinning and Treatment of Interfering Vegetation*

Compartment 38 Stand 13: *43-acre Hardwood Thinning*

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## **I. State Forest Overview**

Savage River State Forest is approximately 55,155 acres in size and is situated in the northeastern quadrant of Garrett County in Western Maryland. It is a second growth mixed hardwood forest dominated by oak species, sugar and red maple, black cherry, hickory and ash. Owing to high rainfall and certain topographic features, Savage River State Forest contains many excellent quality growing sites stocked with superior quality trees. The forest contains approximately 4,000 acres of conifer plantations, established in the 1940's following state acquisition. Red pine is the dominant tree species within these plantations but other conifers include white pine, Norway spruce, larch, and Scotch pine. These plantations were established as nurse crops to rehabilitate abandoned and depleted farm fields, with the long-term goal of conversion back to native hardwoods as appropriate.

Savage River State Forest has been intensively managed for over 60 years. Forest harvest and grooming operations are undertaken to thin overstocked stands, to effectively deal with public safety concerns, to harvest mature or diseased/dying trees, to improve habitat for certain wildlife species, to assist and provide for certain research needs, to address aesthetic concerns, and to increase the proportion of age/height diversity of forested stands.

## **II. Annual Work Plan Summary**

The FY-2018 Annual Work Plan for Savage River State Forest was formulated in 2016. It contains projects to be undertaken in the areas of Special Projects, Maintenance and Operations, Recreation, Watershed Protection, Ecosystem Restoration / Protection, and Wildlife Management. In addition to the routine operations and management of the State Forest, the FY-18 Annual Work Plan for Savage River State Forest details one special management project and 16 land management projects that will be the focus of the State Forest management staff for FY-18. All projects and proposals within this Plan have been developed to meet one or more of the Land Management Guidelines and Objectives outlined in the Savage River State Forest Sustainable Management Plan including:

***Forest Economy:*** management activities with a purpose to maintain an economically sustainable forest and contribute to the local economy through providing forest-related employment and products

***Forest Conservation:*** management activities with a purpose to protect significant or unique natural communities and elements of biological diversity, including Ecologically Significant Areas, High Conservation Value Forests and old growth Forests. Old growth forest management serves to restore and/or enhance old growth forest structure and function.

***Water Quality:*** management activities designed to protect or improve ecological functions in protecting or enhancing water quality.

***Wildlife Habitat:*** management activities with a purpose to maintain and enhance the ecological needs of the diversity of wildlife species and habitat types.

*Recreation and Cultural Heritage: management activities with a purpose to maintain and enhance areas that serve as visual, public camping, designated trails, and other high public use areas.*

**A. Special Management Projects Include:**

**1. Continued Development of the Certified, State Forest Sustainable Forest Management Plan** - with special focus on addressing items identified as in need of improvement as a result of the 2016 FSC/SFI Certification Audits.

**2. Forest Stand Delineation, Inventory and Monitoring** – Completion of the project to reinventory and redefine stands on the entire forest. This critical project will continue in FY-18. To date, 80% of the forest wide data collection is completed. The project will allow a thorough analysis of this complete data set from which further management plans will be derived. Inventory work will continue in the form of follow-up monitoring protocols associated with the initial inventory and certification requirements.

**3. Non-Native Invasive Species (NNIS) Inventory and Control Work** - The Sustainable Forest Management Plan calls for various responses to NNIS and the Forest Inventory Project has allowed for a broad view of the problem forest wide.

**B. Land Management Projects Include:**

**1.** Continuation of the ecosystem restoration project involving control of invasive, exotic plants forest wide.

**2.** Continuation of the ecosystem restoration efforts involving control of invasive, exotic forest pests, particularly the Hemlock wooly adelgid.

**3.** 11 Silvicultural projects including:

7 Intermediate Harvests on 324 acres.

2 Regeneration Harvests on 73 acres.

2 Non-commercial interfering vegetation control projects on 77 acres.

**4.** Five noncommercial silvicultural practices to promote regeneration including:

\*Four Projects to control interfering and undesirable tall woody vegetation to promote seedling establishment on 226 acres.

\*One Project to control interfering and undesirable fern and grass to promote seedling establishment on 46 acres.

Forest harvest operations are undertaken to utilize mature and dead/dying/diseased trees; to thin overstocked stands; to improve and diversify wildlife habitat; to effectively correct public safety concerns and issues; to reduce the forests vulnerability to insect attack, disease or wildfire hazard; to facilitate certain approved research needs; to improve certain aesthetic aspects of an area; and to improve the proportions of age class and species diversity within stands and management blocks. This forest has been intensively managed for over 100 years, utilizing both

even and uneven-aged techniques via selective removals and regeneration harvests. Early records indicate that as cut over land was acquired, foresters culled the forest, removing the poorly formed and damaged timber left behind in the wake of the cut and run practices employed by early timber speculators. By removing these undesirable trees, newly forming seedlings were released from competition and were thus cultured into the future growing stock of trees that we enjoy today. The benefits of this work have been significant including improved wildlife habitat diversity, improved forest health and more abundant mast production, improved utilization of gypsy moth damaged trees, reduced forest fire hazard, and the considerable financial contribution of management to the state and local economies as well as to those employed in the forest products industry.

The FY-18 Annual Work Plan calls for nine harvests on 397 acres, accounting for a harvest of approximately 1,200,000 board feet of sawtimber - putting an estimated \$250,000 worth of raw wood products into the local markets. Much of the silvicultural work laid out in this work plan is focused on initiating seedling development to better insure regeneration successes in future harvests. Much of the value of the harvests in the work plan will be directed back into the forest providing the essential investment in pre-harvest cultural work that will assure the long term sustainable management of these important forest resources.

The cultural operations and management projects outlined within the FY-18 Annual Work Plan are selected to provide significant contributions to the sustainability of forest resources found within the State Forest and the ecosystems associated with it.

### III. General Location Map for FY-18 Land Management Project Proposals

#### Map Key

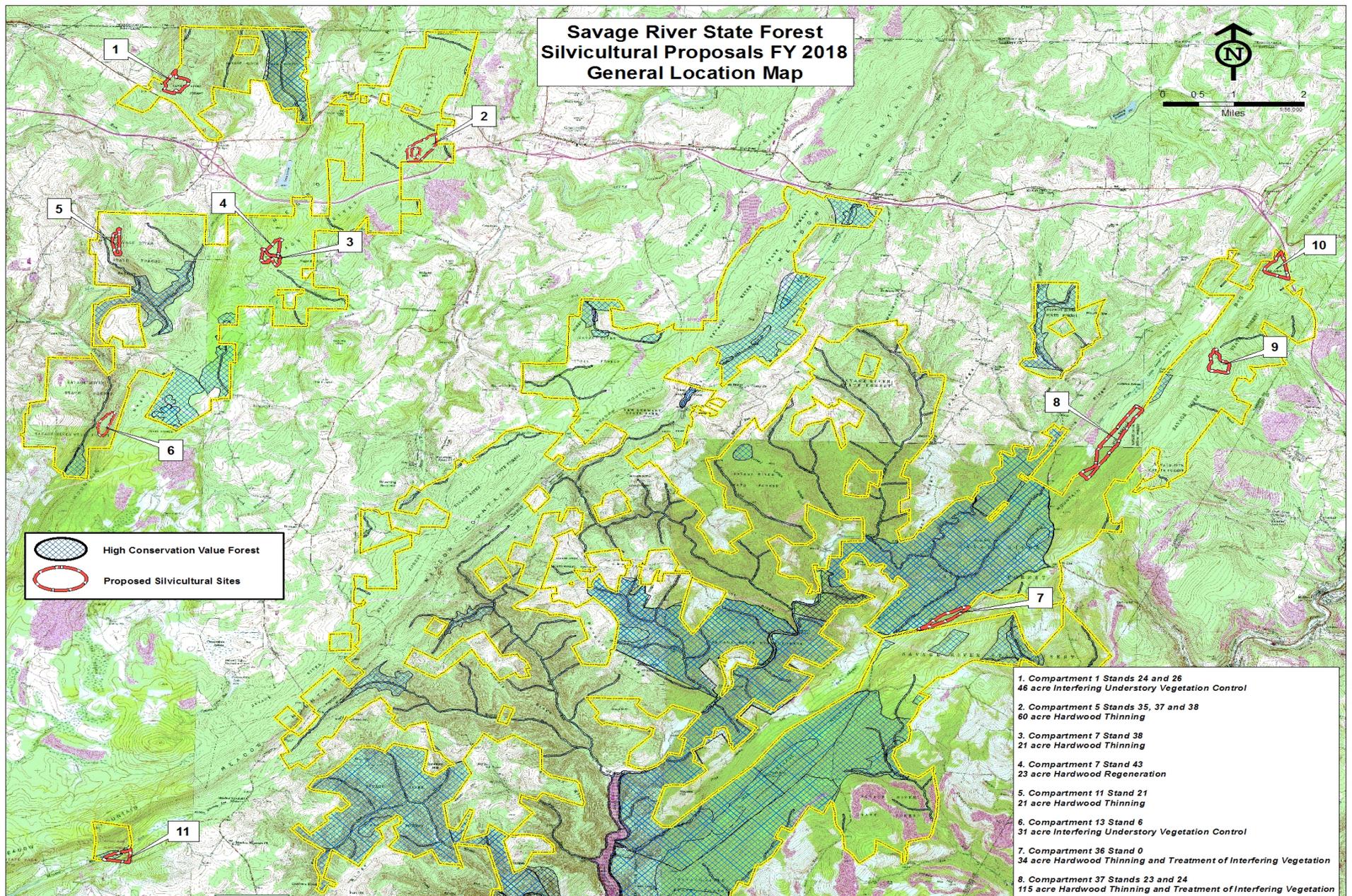
- |  |   |
|--|---|
| <i>1. Compartment 1 Stands 24 and 26</i>     | <i>46-acre Interfering Understory Vegetation Control</i>                  |
| <i>2. Compartment 5 Stands 35, 37 and 38</i> | <i>60-acre Hardwood Thinning</i>  |
| <i>3. Compartment 7 Stand 38</i>             | <i>21-acre Hardwood Thinning</i>  |
| <i>4. Compartment 7 Stand 43</i>             | <i>23-acre Hardwood Regeneration</i>                                      |
| <i>5. Compartment 11 Stand 21</i>            | <i>21-acre Hardwood Thinning</i>  |
| <i>6. Compartment 13 Stand 6</i>             | <i>31-acre Interfering Understory Vegetation Control</i>                  |
| <i>7. Compartment 36 Stand 0</i>             | <i>34-acre Hardwood Thinning and Treatment of Interfering Vegetation</i>  |
| <i>8. Compartment 37 Stands 23 and 24</i>    | <i>115-acre Hardwood Thinning and Treatment of Interfering Vegetation</i> |
| <i>9. Compartment 38 Stand 13</i>            | <i>42-acre Hardwood Thinning</i>  |
| <i>10. Compartment 38 Stand 20</i>           | <i>55-acre Hardwood Regeneration</i>                                      |
| <i>11. Compartment 77 Stands 2, 5 and 7</i>  | <i>30-acre White Pine Release</i>   |

## Savage River State Forest Silvicultural Proposals FY 2018 General Location Map



	High Conservation Value Forest
	Proposed Silvicultural Sites

1. Compartment 1 Stands 24 and 26  
46 acre Interfering Understory Vegetation Control
2. Compartment 5 Stands 35, 37 and 38  
60 acre Hardwood Thinning
3. Compartment 7 Stand 38  
21 acre Hardwood Thinning
4. Compartment 7 Stand 43  
23 acre Hardwood Regeneration
5. Compartment 11 Stand 21  
21 acre Hardwood Thinning
6. Compartment 13 Stand 6  
31 acre Interfering Understory Vegetation Control
7. Compartment 36 Stand 0  
34 acre Hardwood Thinning and Treatment of Interfering Vegetation
8. Compartment 37 Stands 23 and 24  
115 acre Hardwood Thinning and Treatment of Interfering Vegetation



## **IV. Special Projects - Forest Resource Management and Planning**

### **A. Continued Development of the Certified State Forest Sustainable Forest Management Plan.**

(This work done with special focus on addressing items identified as in need of improvement as a result of 2016 FSC/SFI Certification Audits.)

Beginning in 2011, the Forest Service began revising the long term sustainable management plans for all three of the State Forests in the Western Region. The initial framework follows the sustainable management plan format established for the State of Maryland's Chesapeake Forest on the Eastern shore. The Department's goal is to have the updated sustainable forest management plans receive dual third party certification under both the Forest Stewardship Councils (FSC) and Sustainable Forestry Initiatives (SFI) standards and guidelines.

Throughout the course of the last five years, broad resource assessments were carried out identifying the various management units and features located on the forests including identification and mapping of High Conservation Value Forest Areas (HCVF), much of which was formerly identified as the State Forests "Special Management Zone". Within the HCVF are located a broad range of Ecologically Significant Areas (ESA). These areas typically contain rare, threatened or endangered species and their critical habitats. By spring of 2011 initial drafts of the Forest's Sustainable Management Plan were developed and shared with stakeholders for initial comment and review. The plans were submitted to both the FSC and SFI organizations in the spring of 2011, at which point audits have been completed on all three of the western state forests. Following the audits, draft plans and audit findings were presented to the State Forests Citizen Advisory Committees for review and comments. The Draft Sustainable Management Plans were made available for public comment fall of 2011.

Each year the State Forests Management Program is audited for compliance to the standards set forth by the Certifying Organizations. Any shortcomings in the programs identified during the audits are identified in a Corrective Action Reports (CARs) and/or observations identified as being in need of improvement in order to be "certified" as sustainably managed forest lands under the internationally recognized FSC and SFI standards. These corrective actions vary from simple formal documentation of routine practices, to more complex policy and procedure development involving various stakeholders and partners. The program requires that all of these items be addressed before the next annual audit, with some needing more immediate attention. The 2016 audit resulted in no CARs or observations that are to be addressed by the next audit. (See Appendix 1 for brief summary of audit findings). State Forest staff time and field operations are adjusted and redirected to assist in addressing any Corrective Action items in the course of the next year.

## **B. Forest Stand Delineation, Inventory and Monitoring**

A critical part of developing long term sustainable management plans is the availability of up-to-date forest inventory data. To this end, the State Forest's staff has been fully engaged in revising the forest stand delineation on the forests. The process continues to consume considerable staff resources as this project is taking shape. This ambitious undertaking has involved collecting detailed inventory data on both overstory and understory conditions over the entire State Forest. The data has been collected and analyzed using the SILVAH Inventory System developed by the US Forest Service.

The project involves collecting information on some 35,000 sample points. As the data must be collected during full leaf out seasons between hard frost dates, the working window is five months. The work force of skilled technicians available is generally college students that can only offer three months work before returning to school. To this end, the project is expected to take 4-5 years to complete and will cost approx. \$40,000/yr. The Assistant Forest Manager and our full time Forest Technician lead and manage this special project on top of their full work load implementing the Annual Work Plan on the forest. The stand delineation and inventory project has resulted in the pulling of one man from his normal duties for the equivalent of approximately six months each year to serve as crew leader, provide project planning, and processing data. Staff assignments and field operations have been adjusted to assure the timely and accurate completion of this important field level assessment that will serve as the basis from which we will draw management decisions from for the next 10-15 years.

With the close of the sixth inventory season in FY-17, 100% of initial data collection has been completed on the harvestable areas of the forest. FY-18 will commit time and resources to do final processing of this data from which we continue to draw upon for management planning direction as well as completing a general inventory of the remaining High Conservation Value Forest. The demand for this important data set is increasingly evident as special projects evolving out of demands placed by Forest Certification Standards are utilizing portions of this work in progress/partial data set for project planning. Examples include the NNIS Inventory and Control Project in the ESAs of the Forest, as well as the Fiscal Year Work Plans.

What had historically been carried out on a 10-year interval offering a snap shot in time view of the forest, has evolved into an annual sampling approach that gives a more frequent look at overall forest condition throughout the years. This approach will allow a much closer watch on developing forest conditions and allows for a more rapid and timely response. This approach is especially valuable in light of the numerous and frequent introductions of foreign insects, diseases, and invasive plants that can rapidly disrupt forest systems. The initial Stand Delineation and Inventory Project will be continued as a Forest Monitoring program as required under certification in order to allow for documented observations of changing conditions throughout the forest. Program focus will include: monitoring of developing regeneration sites allowing for the timely response to the investment in intensive silvicultural work such as herbicide control of invasive and interfering plants, fencing, and prescribed fire; NNIS monitoring and control work (beyond the special project area identified in this AWP below); silvicultural results with respect to management objectives and outcomes and recreation/visitor impacts, etc.

## **V. Maintenance and Operations**

Aside from the detailed cultural work planned for the State Forests, the following is a partial list of projects that are often on-going from year to year and are an integral part of State Forest operations: Routine maintenance projects include building repair and maintenance, vehicle maintenance, mowing at the office facility, snow removal, repair and replacement of fire rings and tables at the camp sites, brush hogging trails, and repair of road surfaces.

### **A. Maintenance and Management of Roads and Trails**

There are approximately 101 miles of trail and hardened road surface on the forest and approximately 1/3 of the mileage is maintained each year. Maintenance in these areas includes brush hogging, mowing, and rehabilitation of road surfaces. Herbicide usage has been integrated into the road maintenance regime in order to control growth in areas where mechanical control methods are not feasible (i.e. steep slopes, narrow paths, rocky areas). The use of herbicide along forest roadways can also reduce operational costs for the maintenance staff by controlling unwanted vegetation along these travel corridors for several years, when applied properly.

### **B. Boundary Line Maintenance**

Savage River State Forest has 337 miles of boundary line currently, including interior lines, exterior lines and road frontage. Boundary maintenance is critical to the management of all public lands. In order to keep up with this effort, State Forest staff maintain approximately 60 miles of line each year. In addition to routine marking and painting, considerable effort is spent on researching, relocating, or establishing missing and/or new line, as well as addressing boundary conflicts. As conflicts arise, every effort is made to resolve the issue in a timely and professional manner. Often, this work leads to the need for a licensed surveyor and legal recourse in order to resolve the issue. With the assistance of Land Planning and Acquisition staff, a minimum of five miles of previously unpainted and/or missing boundary line are to be reestablished until the entire forest boundary is demarcated.

### **C. Campground Operation and Maintenance**

There are 71 primitive camp sites that are maintained on a regular schedule throughout the year. Major campsite maintenance coincides with major holidays, the end of winter and at the traditional end of the camping in late summer/early fall. The campsites are also frequented during the white-tailed deer firearms seasons in the fall and winter, during spring turkey season in early spring and during the opening weekend of trout season in late winter/early spring. Maintenance and operation of these primitive campsites includes: managing group site reservations; maintenance of information / bulletin boards; camper contacts to insure policies are understood; self registration fee collections and deposits; weekly site inspection and cleaning; hazardous tree evaluation and removals; grass mowing (typically the week before the summer holidays and otherwise as needed); maintenance and replacement of picnic tables, lantern posts, and fire rings; and site impact monitoring.

#### D. Rifle Range Maintenance and Management

There is a public shooting range on the forest that is open to the public year round. Maintenance is ongoing and includes replacing backstops as well as the backstop stands, trash clean-up, mowing and weed eating around the facility, plowing the entrance road, restocking range permits, collecting range fees and posting range closures when necessary. Prior to and during the various hunting seasons, range use increases appreciably resulting in more frequent maintenance visits. Typically, at the conclusion of spring turkey season, the backstops and stands from the previous year are replaced, depending on the severity of damage.

### VI. Recreation Proposals

#### A. National Recreation Trails Grant Requests – To Enhance Recreation and Trails

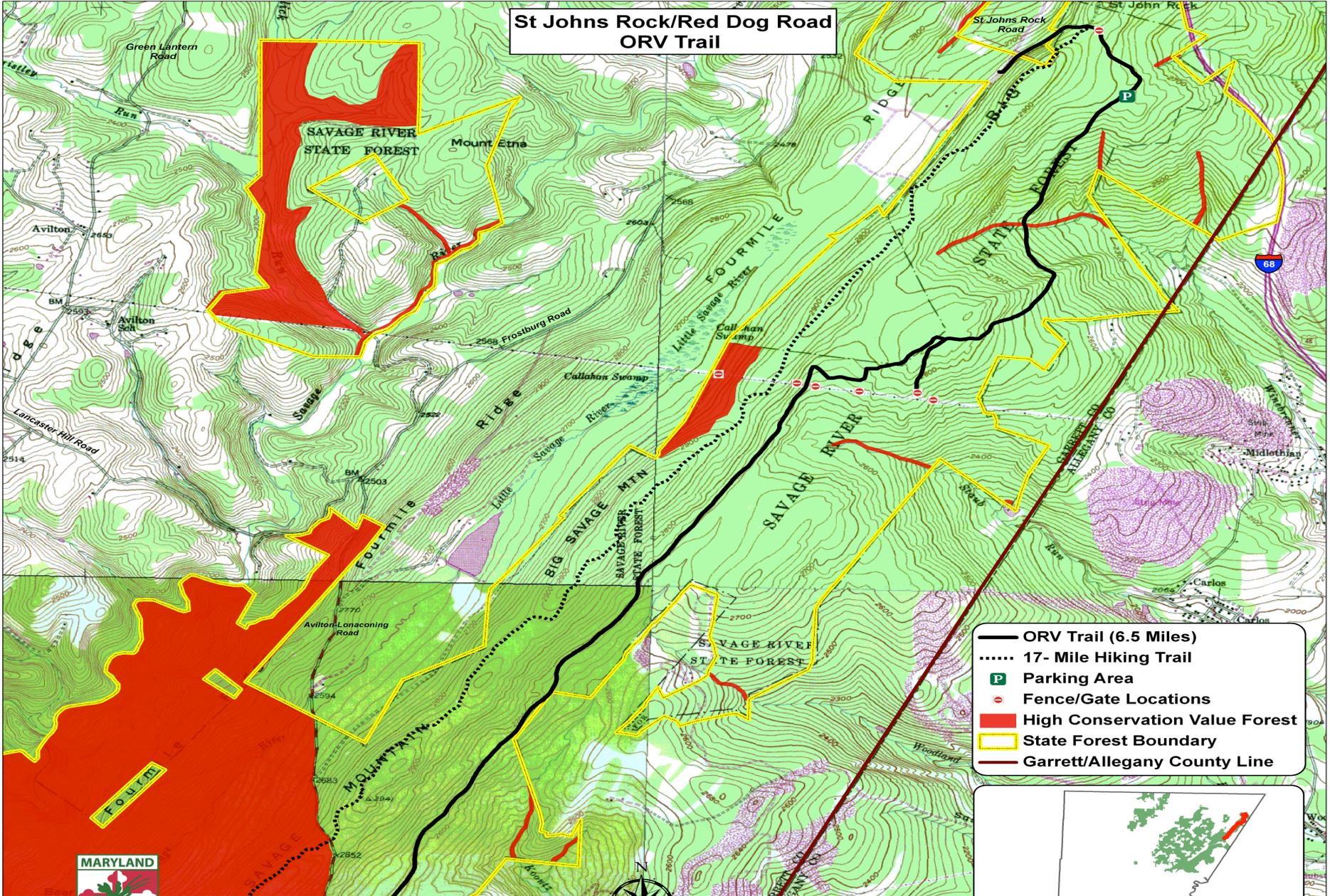
Savage River State Forest has submitted one National Recreation Trails Grant Request to fund enhancements to various recreation trails on the forest:

##### 1. **St. John Rock Road, ORV Trail Maintenance – \$37,500**

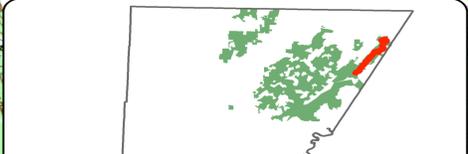
This project will provide seasonal maintenance personnel to maintain the newly developed 7-mile-long St. John Rock Road and Red Dog Road ORV Trail. Hiring these seasonal employees will benefit trail users by maintaining the surface of the trail and providing a safety backup on weekends. Operating the ORV trail will require regular maintenance and upkeep. The grant will fund five elements of trail upkeep including:

- 1) Maintenance of water control devices.
- 2) Monitoring use and providing public outreach.
- 3) Clean up of litter and debris.
- 4) Providing protection to environmentally sensitive areas adjacent to the trail
- 5) Maintaining closure of existing illegal trails and deterring new trails from being developed.

# St Johns Rock/Red Dog Road ORV Trail



- ORV Trail (6.5 Miles)
- ..... 17- Mile Hiking Trail
- P Parking Area
- Fence/Gate Locations
- High Conservation Value Forest
- State Forest Boundary
- Garrett/Allegany County Line



## B. Meadow Mountain Trail Construction (Continental Divide Loop Trail)

In fiscal year 2011, the forest was asked to participate in a large bike trail effort that would begin in Pennsylvania, travel along Meadow Mountain Trail, cross the University of Maryland 4-H property and continue south into Oakland, MD and then travel north through the Youghiogheny Wild and Scenic Corridor back into Pennsylvania. This project is currently referred to as the Continental Divide Loop Trail which is being spearheaded by Garrett Trails, a non-profit volunteer group dedicated to the development of sustainable trails that provide access to the economic, historic and environmental resources of Garrett County.

The southern section of the bike trail from State Route 495 to Frank Brenneman Road was completed in mid 2016. Funding was secured to continue construction of the trail northward beginning at Frank Brenneman Road and ending at New Germany Road just south of West Shale Road following existing forest access roads. The construction bid has been awarded and groundbreaking will occur in late 2016/early 2017 depending on weather conditions. This phase of construction will add approximately 7.5 miles of resurfaced trail to the ongoing project, which when completed, will extend to the northern terminus of East Shale Road totaling over 12 miles of riding surface on the state forest.

## VII. Wildlife Habitat Management Projects

### A. Margraff Plantation Sunflower Field

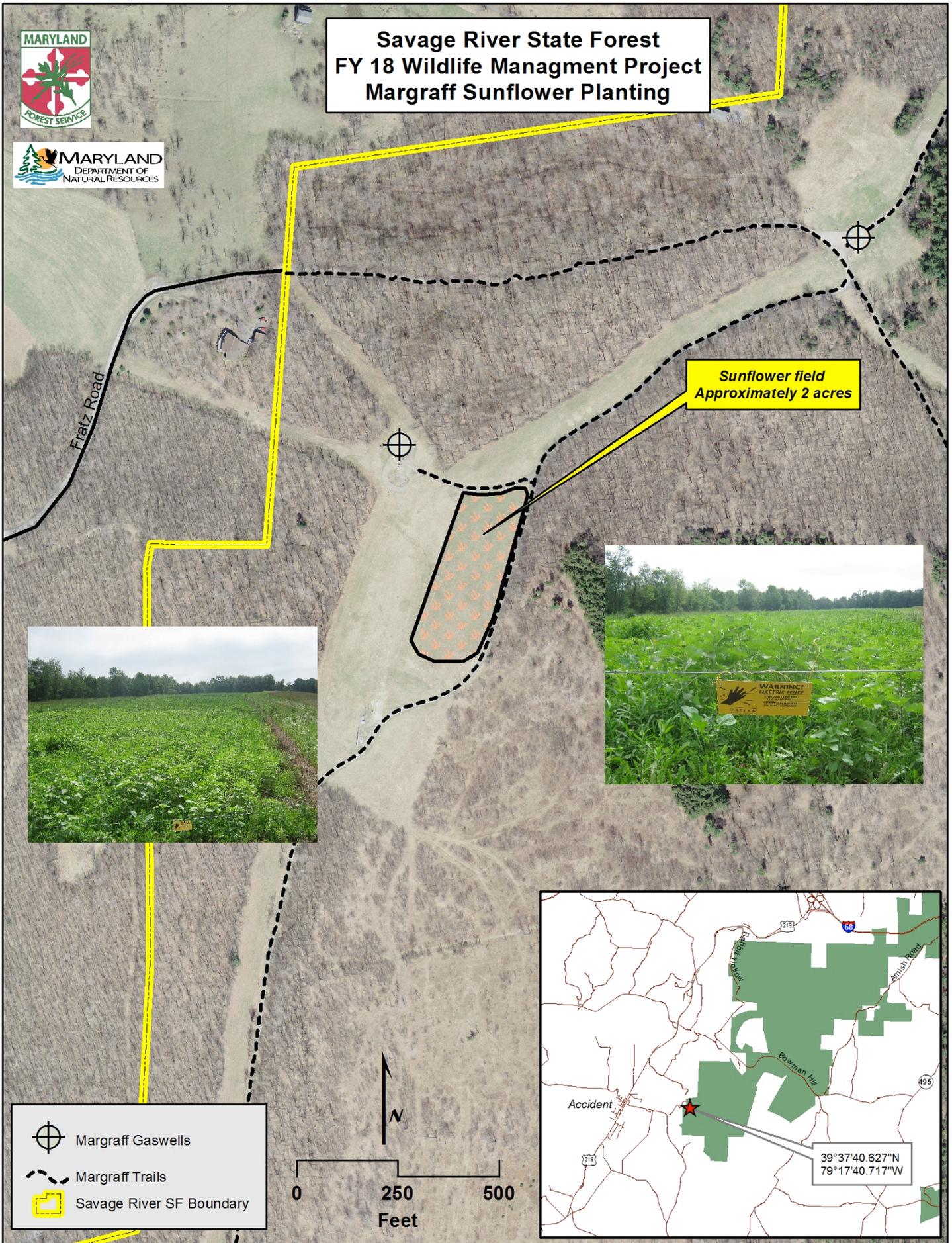
In an attempt to provide mourning dove feeding grounds and subsequently public hunting opportunities for the upland birds, the Wildlife Division has planted a two acre fenced sunflower field along the western edge of the Margraff area of Savage River State Forest (See corresponding map). Maintenance of the area will include general rotational mowing and occasional planting as necessary and as funding permits. The area will be listed in the official DNR dove field publication which will outline hunting regulations specific to the area. Information is also available on the Maryland DNR Wildlife and Heritage Service web page: <http://dnr.maryland.gov/wildlife/Pages/default.aspx>. If the planting endeavor is successful in attracting significant amounts of mourning doves as well as hunters, the plantings may be conducted throughout the wildlife habitat management units on the forest.

### B. General Wildlife Habitat Maintenance

Approximately 15.75 acres of wildlife specific projects have been implemented throughout the state forest. These projects are located in the Margraff tract, Keysers Ridge, Collier Place, West Shale Road, Fairview Road and Kyle's field. General practices include liming and fertilizing as well as planting of cover and grain crops, where appropriate. Plantings include millet, oats, turnips (*Brassica spp.*) and clover. The majority of the efforts are concentrated on planting and maintaining clover cover, which is required to be mowed multiple times in a growing season to prevent weeds from overtaking the site.



# Savage River State Forest FY 18 Wildlife Management Project Margraff Sunflower Planting



## VIII. Ecosystem Restoration / Protection Projects

### A. Non-Native Invasive Species (NNIS) Control

Across the State, a biological invasion of non-native plants is spreading into our fields, forests, wetlands and waterways. Referred to in a variety of ways including exotic, non-native, alien, or non-indigenous, invasive plants impact native plant and animal communities by displacing native vegetation and disrupting habitats as they become established and spread over time. Early Detection and Rapid Response (EDRR) to control the spread of problematic species is important for the conservation of native flora and fauna. Control efforts often require considerable resources (labor, time and money).

As in many cases, the introduction of these widespread and invasive plants cannot be prevented. It is important to evaluate and plan control efforts in order that such efforts contribute meaningfully to the success of forest conservation plans. EDRR efforts targeting NNIS discovered during the forest wide inventory have been successful in identifying and controlling a number of NNIS populations. Species-specific management plans have been developed for two notable species including Japanese knotweed, and Yellow Archangel (See Appendix 1 and 2).

The State Forest staff has treated and/or is monitoring several plant colonies or sites including: four tree-of-heaven sites, ten Japanese knotweed sites, two mile-a-minute weed sites and one yellow archangel site (See corresponding map for locations).

1. Japanese knotweed (*Polygonum cuspidatum*). Several areas of Savage River State Forest have become infested with the invasive plant Japanese knotweed (*Polygonum cuspidatum*). Seven treatment areas have been delineated and six of them will be treated and monitored to determine the most effective course of action for suppressing and ultimately eradicating the plant from these areas of the forest. Knotweed growth below the Savage River Reservoir has reached a critical level and will not be treated at this time due to the overwhelming investment that would be required to reach any reasonable level of control. As more effective treatment methods become available for large areas, this area will be reevaluated in regard to implementing a control plan.

The initial treatments occurred in the first week of June, 2011. Treatments in all areas of the forest involve a two-step process that includes both mechanical and chemical means of control. First, the knotweed is cut and allowed to grow back for 8 weeks, reaching only 2 to 4 feet in height. Second, the new growth is treated with a 2% solution of glyphosate as the active ingredient. Treatment of these areas has been repeated on a yearly basis and will continue until the plant has been eradicated from the target areas.

2. Yellow archangel (*Lamium galeobdolon*). Dry Run, a tributary of the Savage River and Savage River Reservoir has been infested with the aggressively growing, non-native invasive perennial, yellow archangel (*Lamium galeobdolon*). The infestation of the area most likely originated from a private residence which was abandoned and the once maintained yard area was neglected, allowing the plant to escape to the adjacent property. After establishing a colony at the head of the watershed, the plant quickly enveloped the drainage from the private residence to the high water mark of the Savage River Reservoir, encompassing nearly 15 acres of forest land.

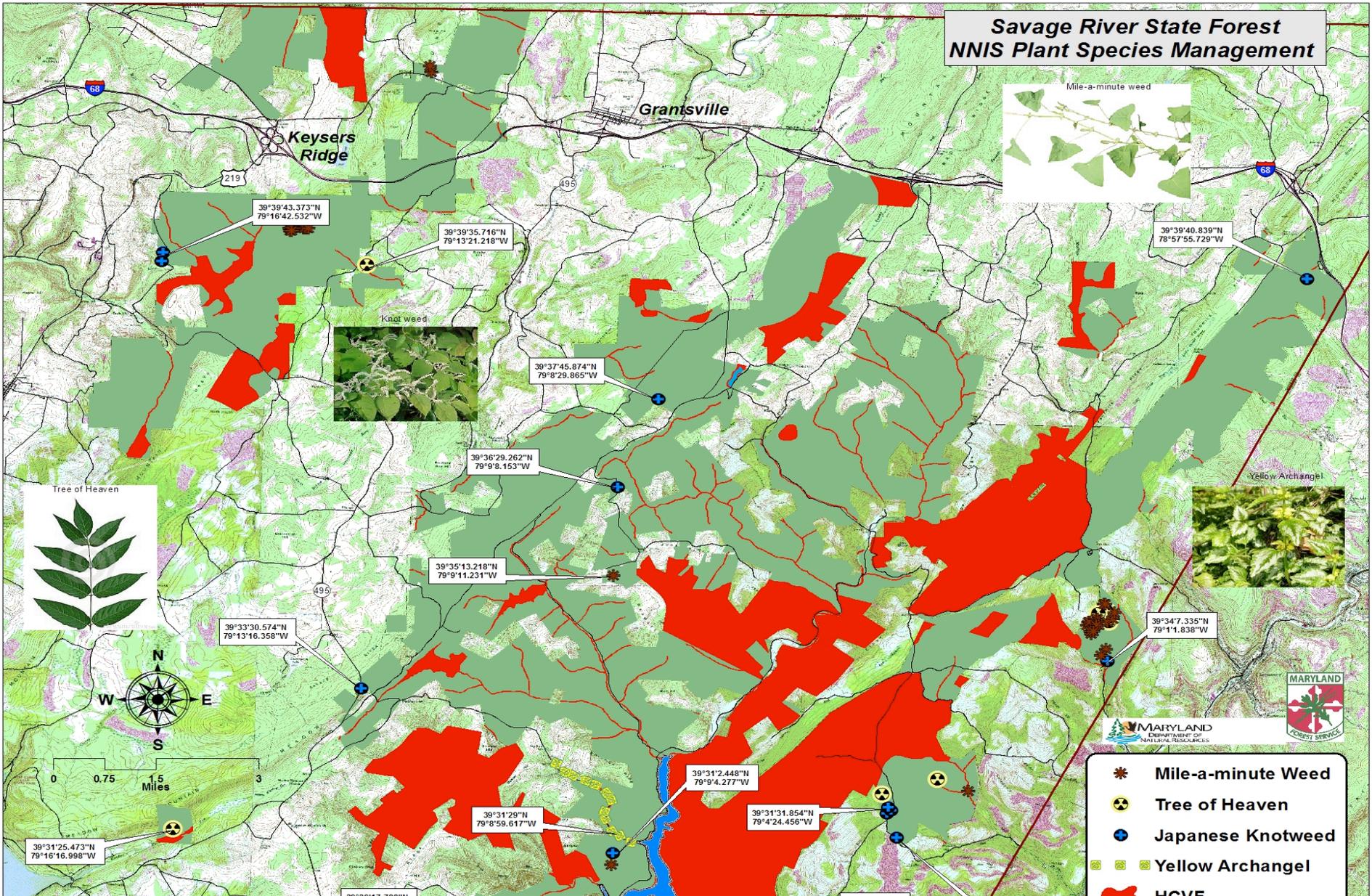
The plant grows quickly and out-competes native vegetation for resources. Yellow archangel spreads in several ways; by seed, by stem fragments, and by rooting at the nodes of the stem. This makes the plant very difficult to control and requires multiple applications of herbicide and diligent monitoring to limit the spread of the plant in natural forest environments. There is no projected end date for the herbicide treatments due to the persistent nature of this plant and efforts will be made annually until the spread of the plant is contained or the plant is eradicated. Successful eradication of this plant is anticipated given the relatively confined area of infestation. Site monitoring will continue after the eradication of the plant for at least 5 years.

3. Mile-a-Minute Weed (*Persicaria perfoliata*) A small patch of mile-a-minute weed (*Persicaria perfoliata*), another aggressive non-native invasive, was discovered in Compartment 29A. The area was treated in FY 15 with a 2% glyphosate solution, but a field survey revealed that the initial treatment was unsuccessful. Herbicide treatment of triclopyr was applied for two consecutive years and monitoring of the site will continue into FY 18 and beyond until the plant has been eradicated. A second site, approximately one acre in size was discovered in Compartment 38 located off the St Johns Rock ORV Trail. Control efforts will be implemented aggressively in an attempt to eradicate the plant from the site before the St. Johns Rock ORV Trail opens to the public and the chances of unintentional spread increase dramatically.

4. Tree-of-Heaven (*Ailanthus altissima*) Individual stems of the exotic invasive tree-of-heaven (*Ailanthus altissima*) have been identified in several areas of the forest. Control measures including both mechanical and chemical have been implemented to remove this species from the limited areas in which it is present.

These plant colonies are now part of our long term monitoring program, with follow-up treatments planned as necessary in the interest of preventing these species from establishing themselves in the otherwise natural forest communities in which they were found.

# Savage River State Forest NNIS Plant Species Management



Mile-a-minute weed



Knot weed



Tree of Heaven



Yellow Archangel



- Mile-a-minute Weed
- Tree of Heaven
- Japanese Knotweed
- Yellow Archangel
- HCVI



0 0.75 1.5 3 Miles

39°31'25.473"N  
79°16'16.998"W

39°33'30.574"N  
79°13'16.358"W

39°35'13.218"N  
79°9'11.231"W

39°36'29.262"N  
79°9'8.153"W

39°37'46.874"N  
79°8'29.865"W

39°39'35.716"N  
79°13'21.218"W

39°39'43.373"N  
79°16'42.532"W

39°31'2.448"N  
79°9'4.277"W

39°31'29"N  
79°8'59.617"W

39°31'31.854"N  
79°4'24.456"W

39°54'7.335"N  
79°11.838"W

39°39'40.839"N  
78°57'55.729"W

Grantsville

Keyzers Ridge

68

219

495

68

## B. Wolf Swamp Hemlock Woolly Adelgid Treatment

Hemlock Woolly Adelgid has been identified as a significant forest pest on the State Forest. As part of a State Wide HWA Management Plan developed to address the impact of the pest, an aggressive management effort is being made to protect what have been identified as high priority Hemlock stands.

In an ongoing, cooperative effort with Maryland Department of Agriculture, and the Maryland State Park Services/Maryland Conservation Corps and the State Forest, 284 acres of the Wolf Swamp ESA have been treated with soil drench/soil injection and individual tree injection treatments of Imidacloprid based HWA insecticide. Planning has begun to continue the treatment regime to include an additional 346 acres of the ESA located north of the initial treatment project.

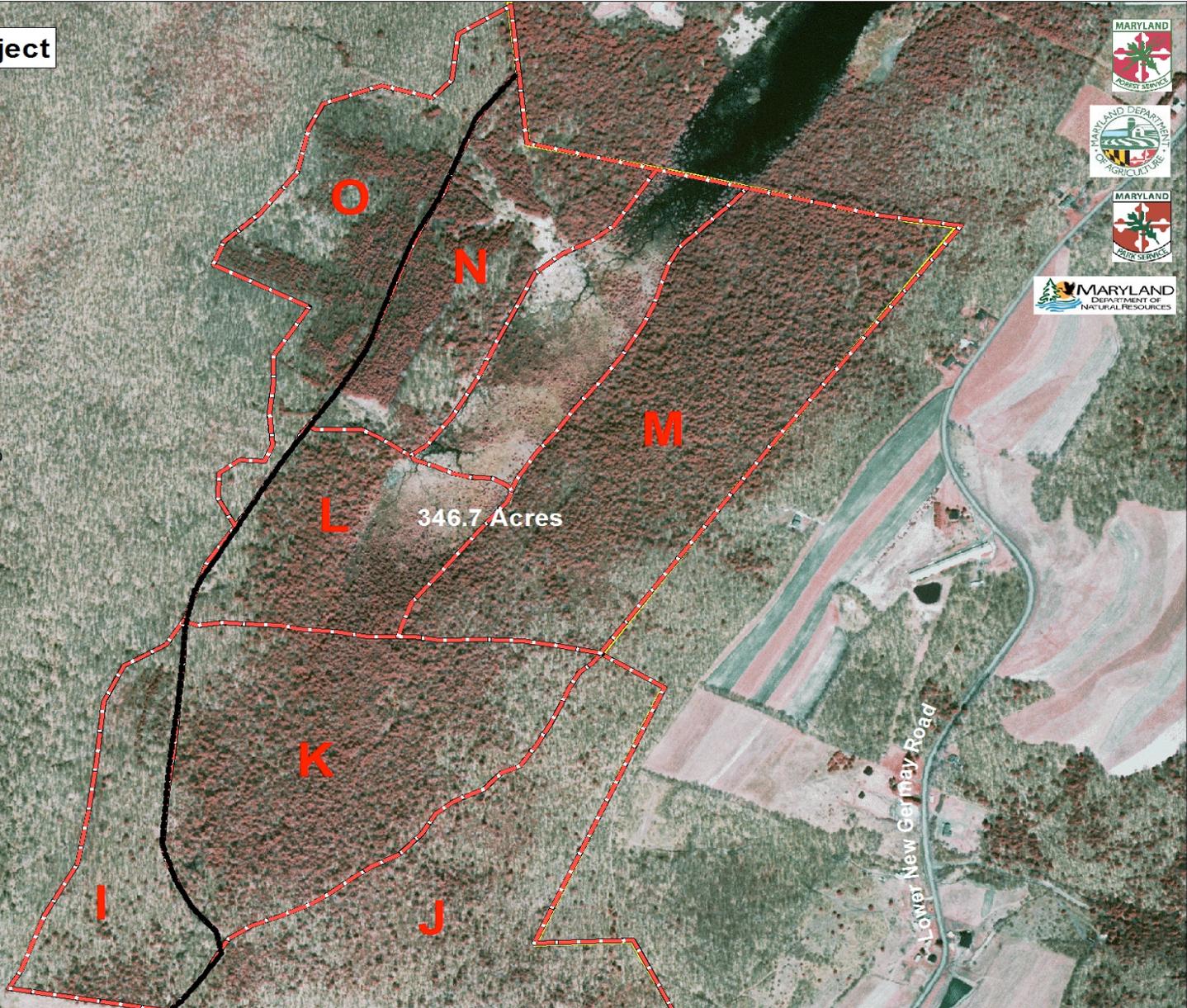
This undertaking began in October 2015, and will continue as resources are available, or the area is fully treated (See Wolf Swamp HWA Treatment Map, p. 17).

## C. Compartment 17: Emerald Ash Borer Treatments in Black Ash

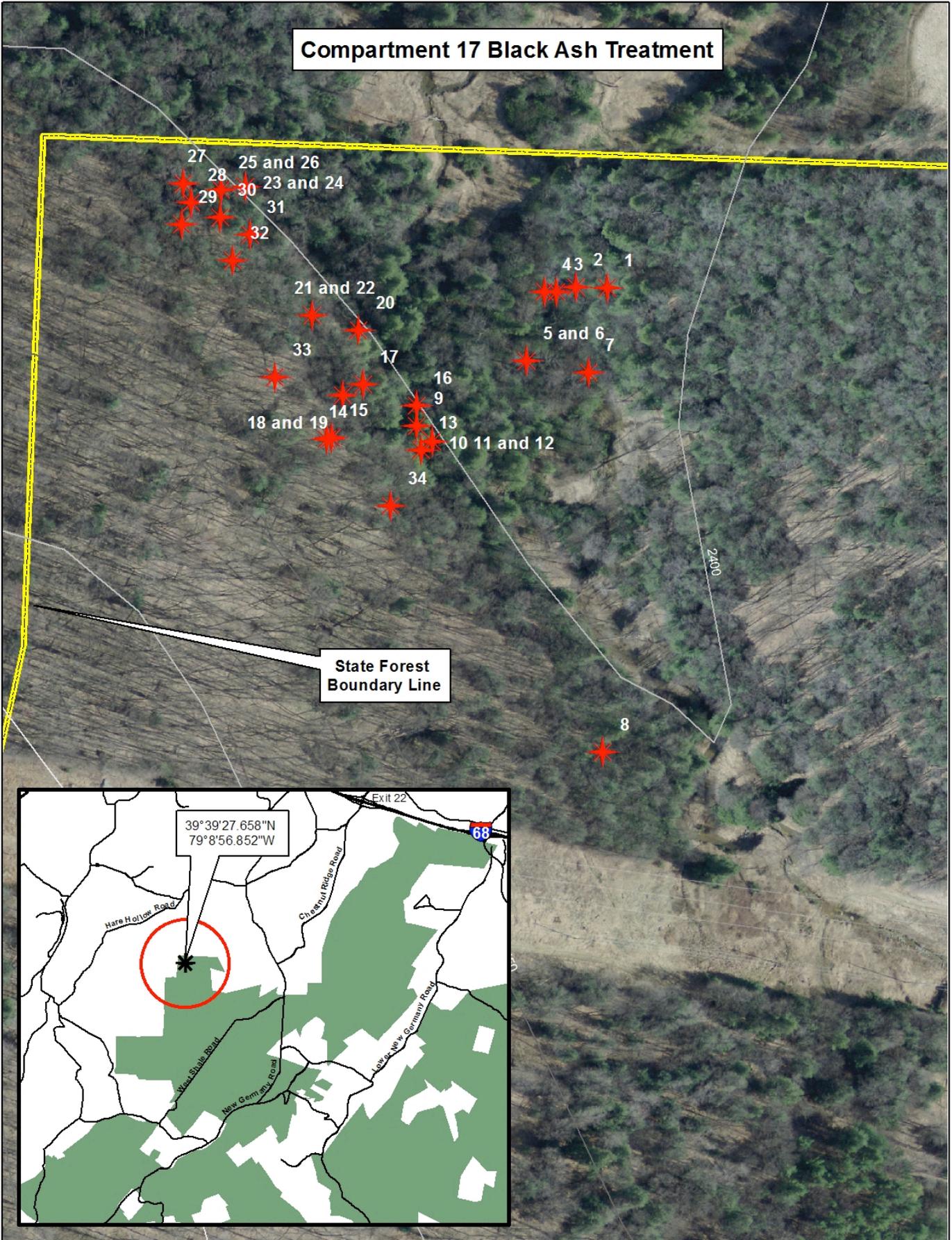
During the data inventory process, an isolated population of black ash (*Fraxinus nigra*) was discovered in Compartment 17 of the Savage River State Forest in an area referred to as the Asa Durst Place (See map). The small stand includes 34 individuals that have escaped infestation by emerald ash borers. In an effort to maintain this uncommon species within the state forest, efforts will be made to prevent mortality caused by the non-native insect pest as well as preserving the seed source.

A re-inventory of the stand was conducted and a GPS position was recorded for each specimen and diameter measurements were recorded as well as an overall relative rating of condition (good, fair, poor). Treatment efforts will be via stem injection and will focus on trees deemed to be in good and fair condition. The insecticide emamectin benzoate marketed as Tree-Äge will be administered providing an estimated two years of protection from EAB. Initial treatments will occur in the fall of 2016. Multiple treatments will be conducted to maintain this rare species on the forest landscape (See Map, p.18).

# Wolf Swamp HWA Project



# Compartment 17 Black Ash Treatment



## **IX. Monitoring and Research Projects**

### **A. Monitoring**

All silvicultural operations taking place on Savage River State Forest will be monitored on a weekly basis, and more frequently when adverse weather conditions arise to ensure that all Best Management Practices specifications are being followed. Regeneration harvests will be monitored five and ten years after harvest. Non-native invasive species will be monitored yearly and herbicide treatment regimes will be implemented as necessary to eradicate these species from the forest ecosystem. Management documents outlining specific treatments and monitoring schedules have been drafted for the individual species.

**B. Research Projects** (*Full descriptions of each project are available at the State Forest Headquarters*)

#### ***1. Chestnut Blight: Evaluating the potential of “Super Donor” strains of *Cryphonectria parasitica* to control chestnut blight infections. West Virginia University.***

Researchers from West Virginia University are conducting an ongoing study involving chestnut blight (*Cryphonectria parasitica*) and the organisms that inhabit the resulting cankers. The purpose of this experimentation is to release two “Super Donor” strains of *C. parasitica* that have the unique ability to transmit the disease controlling hypoviruses to virulent strains regardless of their vegetative compatibility type.

The “Super Donor” strains were constructed using a Cre-lox system and classical mating. Cre-lox recombination is a site-specific recombinase technology, used to carry out deletions and insertions at specific sites in the DNA of cells. No foreign genes were incorporated and the absence of any selectable marker verified. This modification resulted in the elimination of most genes that control vegetative compatibility thereby allowing hypovirus transmission among incompatible strains (MacDonald and Nuss, 2016). An APHIS permit has been applied for and approved for the experimentation; the permit has submitted to the State of Maryland for comment.

The study site is an eight-year-old hardwood salvage harvest located off Russell Road.

#### ***2. Golden-winged warbler***

Surveys are ongoing for the golden-winged warbler (*Vermivora chrysoptera*), a small songbird that is listed as an endangered species in Maryland. The monitoring project is part of the Golden-Winged Warbler Initiative.

**3. Northern Long-eared Bats: Bat monitoring and Habitat Use by Northern Long-eared Bats (*Myotis septentrionalis*) in Western Maryland. University of Maryland Center for Environmental Science.**

Since its detection in 2006, white-nose syndrome (WNS) has caused significant declines in many bat populations in the eastern United States (Turner et al. 2011). The northern long-eared bat (*Myotis septentrionalis*) is one of the bat species most affected by WNS and was listed as federally threatened in 2015 due to precipitous population declines (USFWS 2015, Ingersoll et al. 2013). Suitable roosting habitat is a critical requirement for bats (Kunz and Lumsden 2003); therefore, protecting and managing northern long-eared bat roosting habitat is vital for counteracting population declines caused by WNS. Roost site selection of northern long-eared bats has been well-studied (e.g., Foster and Kurta 1999, Menzel et al. 2002, Henderson and Broders 2008), but relatively few studies have identified roost sites in western Maryland. To identify roost sites, bats will be captured, radio transmitters attached, and telemetry used to locate roost locations in several study areas (Dan's Mountain State Park, Savage River State Forest, and Green Ridge State Forest) in western Maryland. To determine habitat characteristics that influence northern long-eared bat roost selection, habitat variables measured and compared at roost locations to variables measured at random suitable roost trees.

**4. Millipedes: Myriapod Taxonomic Collecting Project. Virginia Polytechnic Institute.**

As part of ongoing research on Myriapoda of North America by the Marek Lab at Virginia Tech, millipedes in the genera *Pseudopolydesmus* and *Nannari* are being collected for molecular and morphological study. The morphological and genetic data that is collected to distinguish species and better understand taxonomy and systematics of the Myriapoda, a group often ignored by biologists. Specimens will be collected by turning over leaf piles with a millipede rake to expose individuals at the soil-leaf interface. No long term traps or installations will be placed in the sample areas. 30-100 specimens will be collected depending on habitat quality and success of the search. Collections will take place in areas with deciduous trees and leaf litter layers will be chosen near streams and moist areas (Hennen).

**5. Eastern Red-backed salamanders: Integrating Thermal Ecology and Physiology of the Widespread Lungless Salamander, *Plethodon cinereus*. University of Maryland.**

The purpose of this research is to integrate behavior, physiological ecology and evolution to measure wildlife responses to climate change. The focus is on whether thermal adaptations will promote or constrain animals' resilience to climate change, in particular eastern red-backed salamanders, the most widespread and abundant terrestrial lungless salamander in the world. Because they are lungless, these salamanders are constrained to cool and moist microhabitats on the forest floor. Given their survival success across a wide range of temperatures, it seems likely that *P. cinereus* has evolved behavioral, ecological or physiological strategies for coping with thermal stress. This research aims to (1) determine whether *P. cinereus* selects microhabitats that optimize physiological performance; (2) measure the relationship between temperature and population viability; (3) determine whether thermal limits vary across the species geographic

range or are limited by evolutionary history. To meet these objectives, physiological experiments will be conducted with salamanders from Maine to North Carolina and the results will contribute to the understanding of species distributions and the potential for physiological adaptation to climate change (Novarro, 2016).

**6. Allegheny Wood Rat: Identifying and Targeting Intervention Strategies for Allegheny Woodrat (*Neotoma magister*) Recovery. Frostburg State University.**

Allegheny woodrats (*Neotoma magister*) are experiencing a protracted decline in the northern half of their range. These declines are rooted in part, in the concomitant loss of American chestnut trees as well as other mast producing species and gypsy moth impacts on oaks. In addition, limited availability of hollow trees for den sites outside of the wood rats primary foraging areas may increase interactions with raccoons, which host a pathogenic roundworm (*Baylisascaris procyonis*) known to cause woodrat mortality. The relationships between woodrat population dynamics, abiotic forest conditions and biotic pathogen loads have been speculated, but there are few studies to address the speculations.

The research project is two tiered and will (1) Determine interactions between woodrat populations and forest dynamics using dendrochronology, mast production data and inventories; (2) Evaluate the occurrence and distribution of raccoons using remote camera, raccoon latrine prevalence and incidence of roundworm parasite load in raccoon feces. This study will be used to target areas of highest need for management intervention. Forest inventories will determine locations where supplemental plantings of mast species will be most beneficial. Evaluation of raccoon activity patterns and parasite load will result in areas of greatest need of antiparasitic bait stations (Brosi, 2016).

**7. *Monarda didyma* (bee balm, Oswego tea) seed collection. National Plant Germplasm System.**

The mission of the National Plant Germplasm System (NPGS) is to preserve genetic diversity of plants and its associated information. The NPGS consists of numerous gene bank facilities across the United States that preserve the genetic profiles of plants. A single site visit will be performed in early October. The goal is to sample seeds from approximately 50 specimens of *Monarda didyma* along with two herbarium specimens. Germplasm will be collected as seeds and the specimens will be harvested in the areas of Fairview Road, Big Run Road and Savage River Road within the Savage River State Forest.

Seeds will be deposited into the National Plant Germplasm System and herbarium specimens at the National Arboretum. Collection gaps have been identified throughout the eastern United States, warranting ex situ collections that may result in attaining additional genetic diversity. Germplasm will be curated on behalf of the United States Government and will be available to all qualified scientists/organizations, domestic and foreign, which are eligible to receive it. Collections will be documented with complete "passport" data (description, locality of collection, including latitude and longitude, etc.). A report providing the passport data will be provided upon completion of collection (Conrad, 2016).

## X. Silvicultural Proposals

### COMPARTMENT 1 Stands 24 and 26

FY-18

#### Description/Resource Impact Assessment

**Location:** This area is located along the north side of State Route 40 in Compartment 1 off the forest access road referred to as “Hard Struggle” in Stands 24 and 26 of the Savage River State Forest. The access road entrance is located approximately 1.3 miles west of the Route 40 / Route 219 intersection at Keyser’s Ridge.

**Forest Community Type and Condition:** This 46-acre site contains a nearly mature northern hardwood stand that is approximately 98 years old with an average merchantable diameter of 17.2 inches. The over story is dominated by red maple (38%), black cherry (24%), red oak (15%) and sweet birch (14%). The stocking in this stand is at 75% relative density with a basal area of 132 ft<sup>2</sup>/acre. Desirable regeneration is scarce in the understory due to the interfering elements that are listed below.

**Interfering Elements:** Deer browse pressure in this area is estimated to be moderate and must be addressed when considering regeneration efforts on this site. Interfering understory plant competition is sufficient to cause significant interference with regeneration efforts with 96% of the site containing some form of significant interference. Tall woody interference is found throughout 82% of the stand and is dominated by sweet birch and striped maple. Problematic levels of ferns and grasses are found on 43% of site. Non-native invasive species (NNIS) including multiflora rose and garlic mustard were found in this stand during the inventory.

**Historic Conditions:** State Forest records show this stand was last thinned in 1973. No evidence of fire was observed during the recon and there is no indication of significant forest pests at this time.

**Rare, Threatened and Endangered Species:** At this time, the Forest Manager knows of no rare, threatened or endangered species on the site or any species that would be impacted by the silvicultural prescription.

**Habitats and Species of Management Concern:** At this time, the Forest Manager knows of no habitats or species of management concern on the site or any species that would be impacted by the silvicultural prescription.

**Water Resources:** This stand drains west toward the headwaters of West Puzzley Run within the Youghiogheny River Watershed. The proposed silvicultural treatments will be outside of all HCVF and stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

**Soil Resources:** Underlying soil type is mapped as Stony land, steep (SrF). This soil is generally moderately deep over bedrock and well drained. Degree of slope ranges from 0-35% throughout the site. Equipment limits range from slight to moderate, moderate to severe on slopes over 35%. Hazard of erosion is slight to moderate on steeper slopes. The site has very good productivity for woodland management, with a site index of 75-85 for upland oaks on north aspects. This soil type provides excellent watershed protection and habitat for wildlife.

**Recreation Resources:** No developed recreational resources are located within the stand. The access road for the stand is primarily utilized for hunting access. The recommended prescription for this stand does not include any mechanical harvesting of any wood products and therefore will not limit hunting opportunities as the project is being completed.

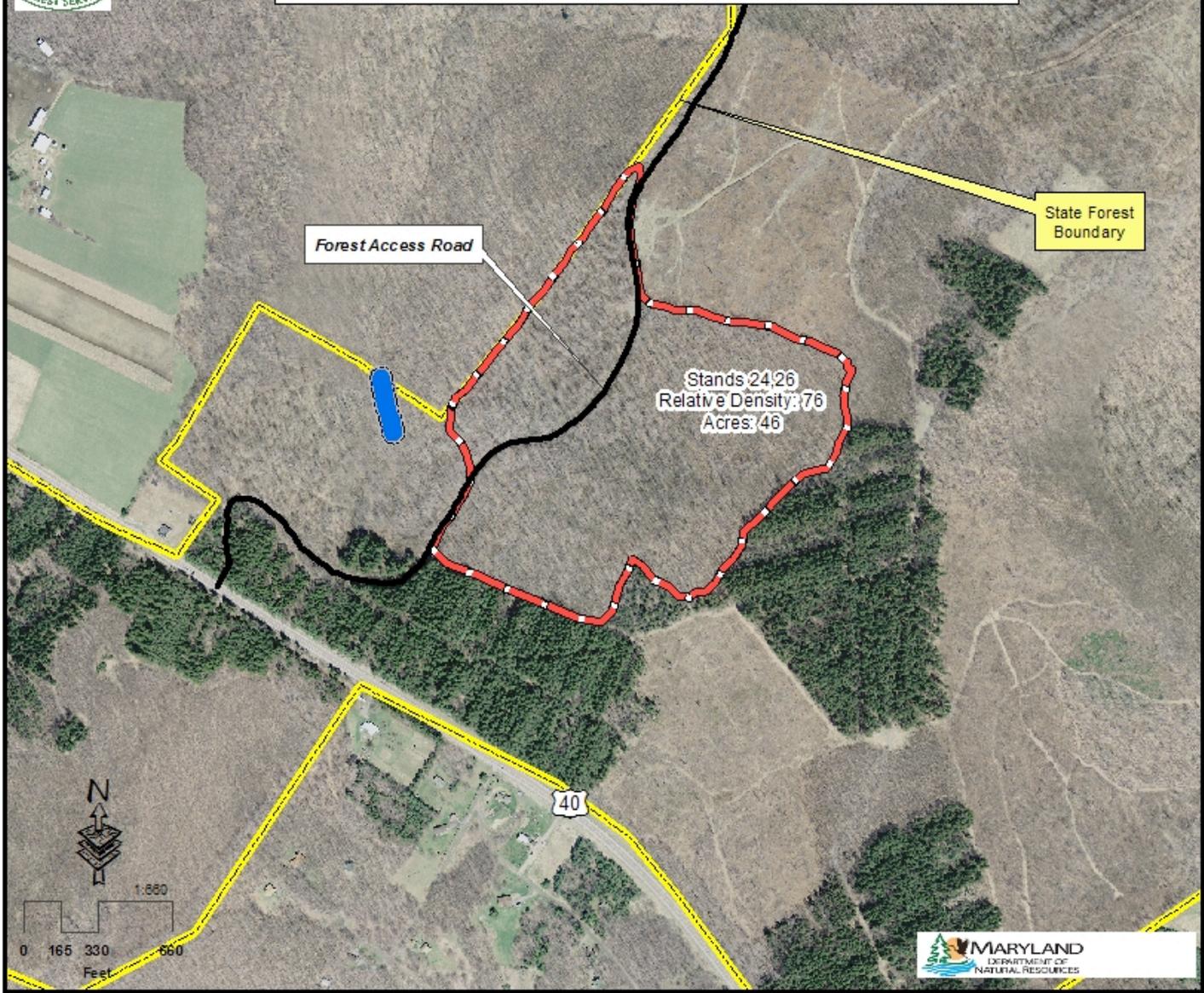
### **Management and Silvicultural Recommendations**

Due to the lack of established desirable regeneration and the overabundance of interfering vegetation in this mature stand, the planned silvicultural treatment for this stand is to treat and control the interfering understory vegetation using herbicide applications. The interfering woody vegetation in the mid canopy 0.5"- 6" will be controlled using low volume, direct herbicide applications with a suitable herbicide applied to the target trees via one of three methods: cut surface, hack and squirt or basal bark application. Additionally, the interfering ferns and grasses/sedges will be treated with appropriate herbicides using broadcast foliar applications. The objective of these treatments is to open the forest floor to increased levels of diffuse sunlight necessary for desired seedling establishment and height growth development.

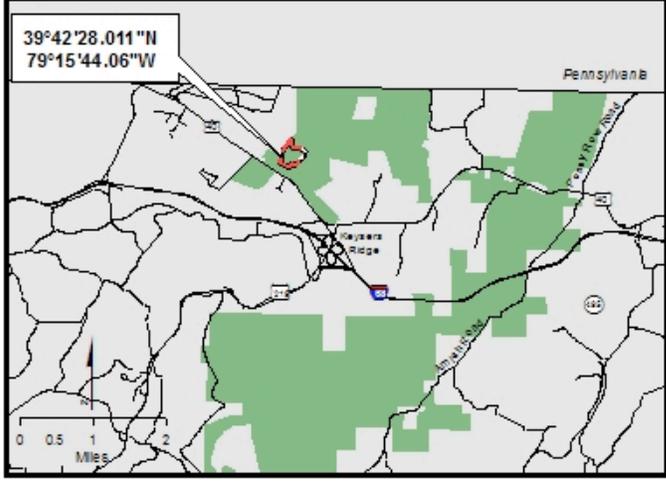
The stand will be monitored annually for the establishment of desirable regeneration. Depending on the regeneration response to this treatment, a shelterwood harvest may be required to facilitate the growth into a competitive cohort. When the regeneration reaches competitive size and can provide a fully stocked stand a final removal harvest will be implemented.

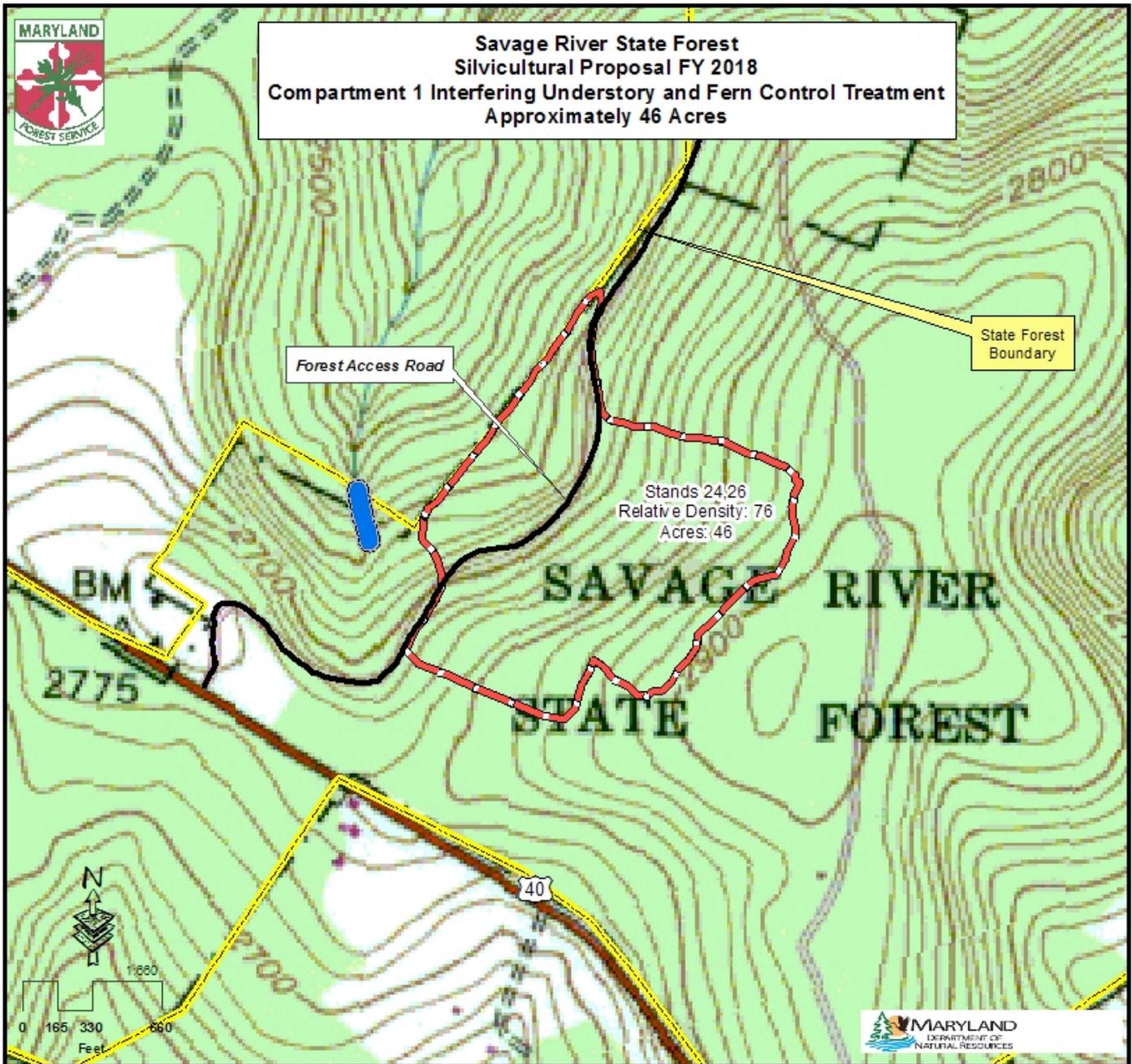


Savage River State Forest  
Silvicultural Proposal FY 2018  
Compartment 1 Interfering Understory and Fern Control Treatment  
Approximately 46 Acres

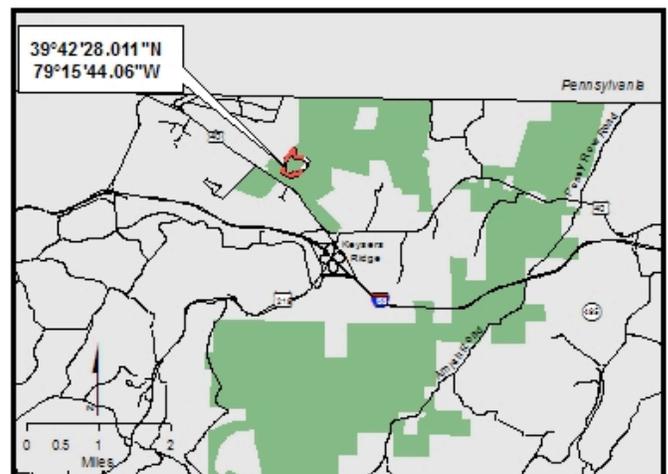


- Wildlands
- Ecologically Significant Area
- Old Growth
- Old Growth Ecosystem Area
- Wetland of State Concern
- Streams and 50' Buffers





-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**



**Description/Resource Impact Assessment**

**Location:** This site is located along the northwest side of Amish Road approximately 0.6 miles south of the intersection with State Route 40 in Compartment 5 Stands 35, 37 and 38 of the Savage River State Forest.

**Forest Community Type and Condition:** This 60-acre site contains an immature mixed oak stand that is approximately 84 years old, with an average merchantable diameter of 14.1 inches. The overstory consists of northern red oak (50%), red maple (21%), chestnut oak (19%) and white oak (7%). This stand is overstocked at 95% relative density, and has an average basal area of 129 ft<sup>2</sup> /acre. Overall oak regeneration occupies 18% of the site, with 8% considered competitive, 7% established and 3% new. A mountain laurel thicket covering approximately 11 acres is located within the proposed harvest area. Mountain laurel is present on 100% of the stand and the concentration of the low woody cover creates a unique habitat niche. The stand is composed of small poletimber with an average diameter of 6.8". This stand will be excluded from the harvest operation and will be retained as part of the management unit.

**Interfering Elements:** Deer browsing pressure in this area is estimated to be moderate and must be addressed when considering implementing regeneration efforts on this site. Interfering understory plant competition is not sufficient enough to cause significant interference with regeneration efforts with only 30% of the site containing some form of significant interfering vegetation. The tall woody interference which occupies approximately 25% of the stand is consists of primarily witch hazel, sweet birch and striped maple. Low woody interference occupies approximately 12% of the site and is not a significant deterrent to regeneration at this time. Problematic levels of fern and grasses occupy 8% of the stand and presently do not pose a problem for future regeneration efforts. No non-native invasive species (NNIS) were observed during the stand inventory.

**Historic Conditions:** State Forest records show this stand was thinned in 1976. No evidence of fire was observed during the recon. No sign of significant insect infestation was observed at time of recon.

**Rare, Threatened and Endangered Species:** At this time, the Forest Manager knows of no rare, threatened or endangered species on the site, or any species that would be impacted by the silvicultural prescription.

**Habitats and Species of Management Concern:** At this time, the Forest Manager knows of no habitats or species of management concern on the site or any species that would be impacted by the silvicultural prescription.

**Water Resources:** This stand drains east into Spiker Run, within the Casselman River Watershed. The proposed silvicultural treatments will be outside of all HCVF and stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any

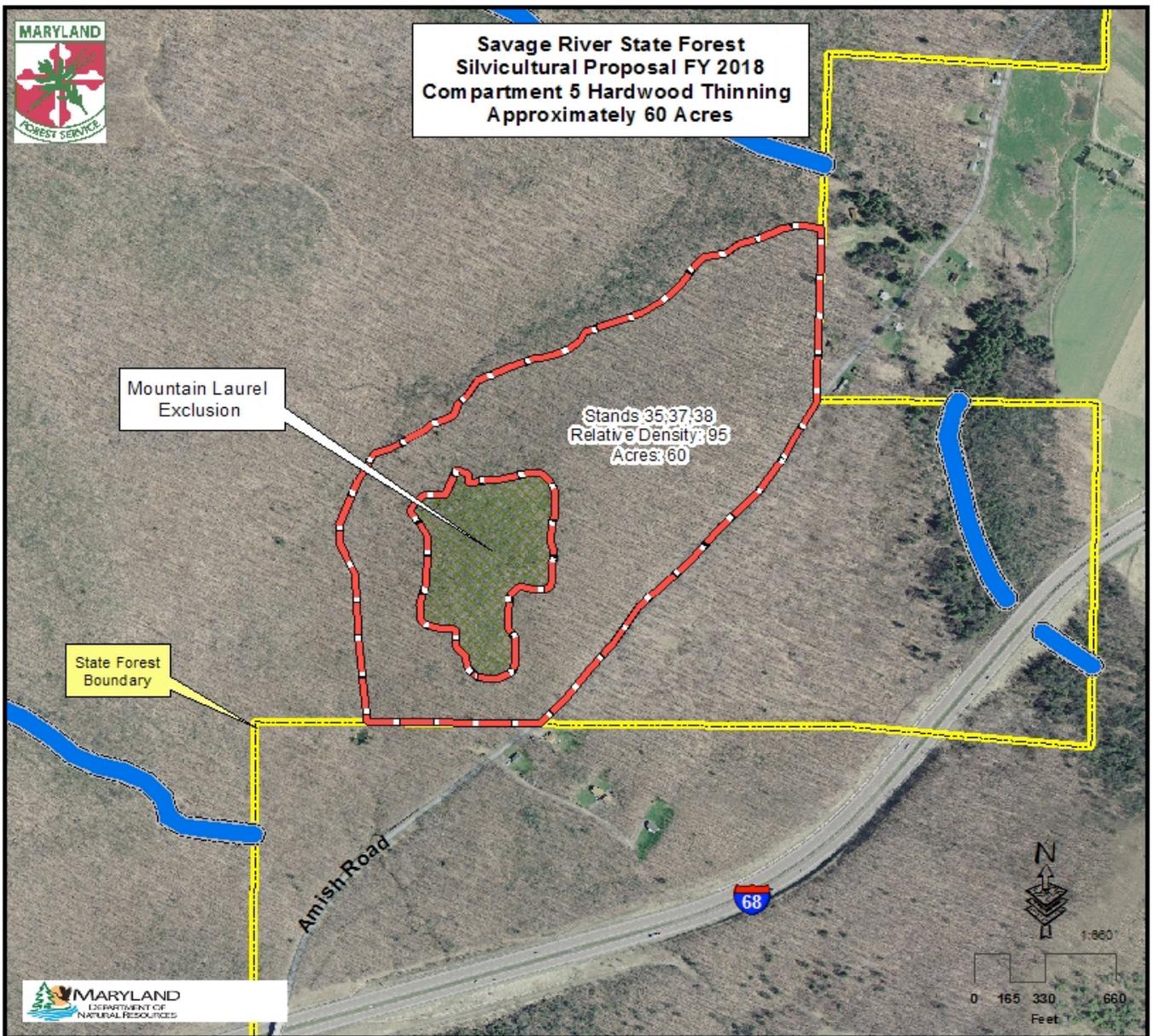
streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

**Soil Resources:** Underlying soils are mapped as Very stony land, rolling (VsD) and Cookport and Ernest very stony silt loams (CuB). These soils are generally moderately deep over bedrock and are well drained. Degree of slope ranges from 0-8% throughout the site. Equipment limits range from slight to moderate. Hazard of erosion is slight to moderate on steeper slopes. The site has very good productivity for woodland management, with a site index of 75-85 for upland oaks. The productivity of the site will be protected by minimizing the haul roads and skid trails as per the Department's Best Management Practices and rutting guidelines.

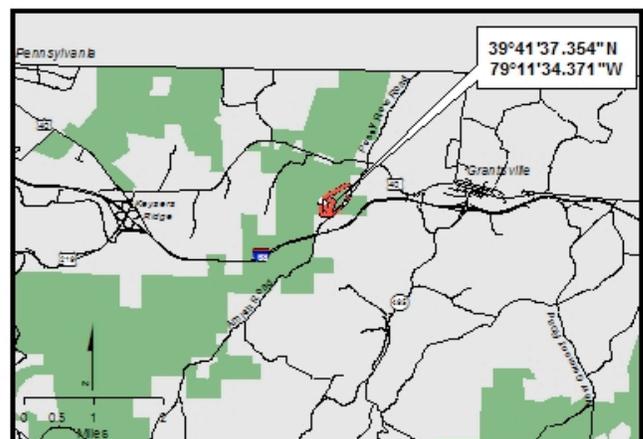
**Recreation Resources:** No developed recreational resources are located within the stand. The main recreational activity performed within this area is hunting. Hunting opportunities may be disrupted for the duration of the harvest activities and access to the site may be limited depending on the timing of the harvest.

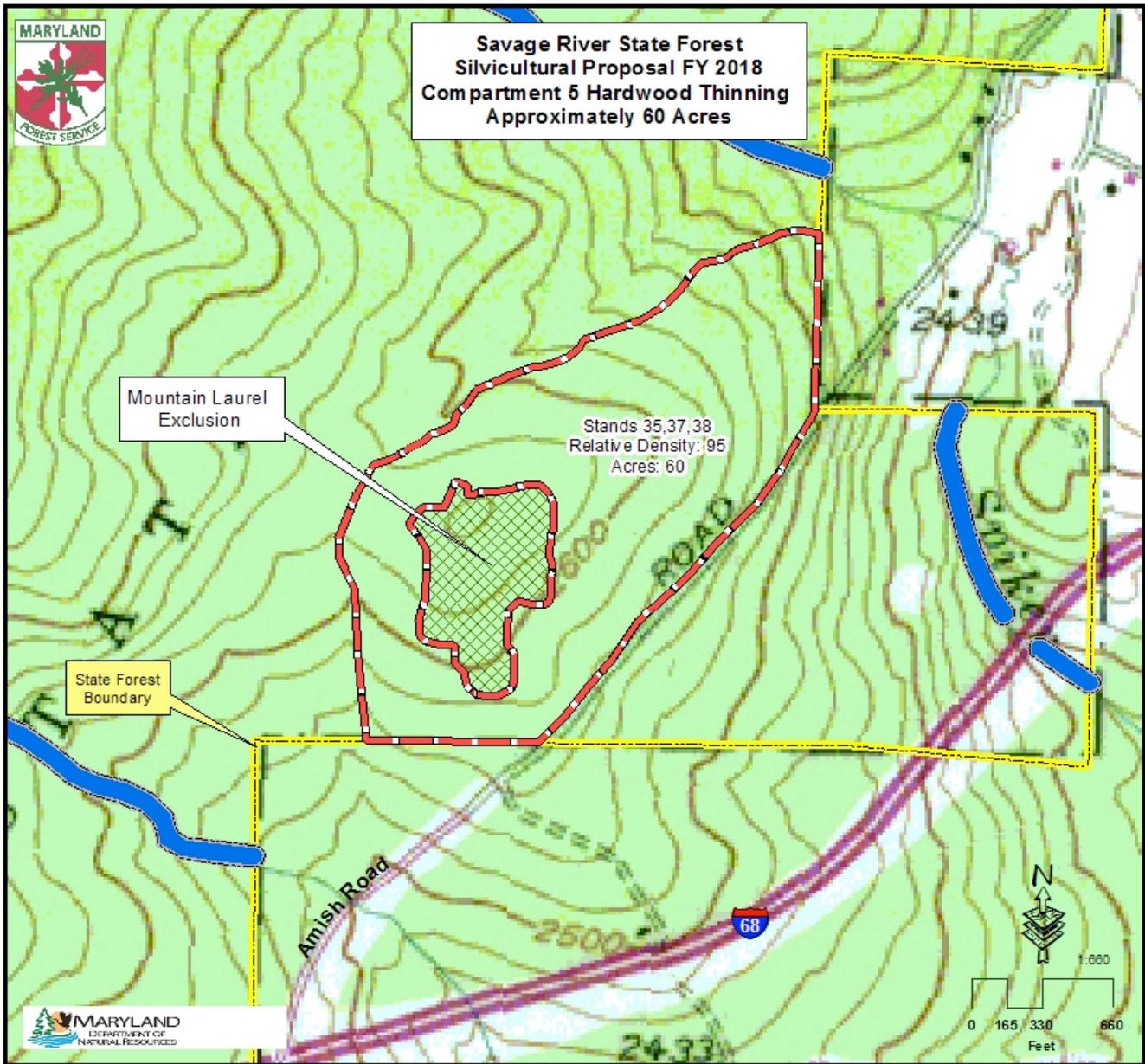
### **Management and Silvicultural Recommendations**

The planned silvicultural treatment for this site is a thinning. The objective of this thinning is simply to reduce stocking levels in order to lessen competition among the remaining trees thereby, increasing the health, vigor and growth rate of the residual stand. The canopy gaps created by the thinning will provide more light to the present oak regeneration aiding it in reaching a successive cohort. The thinning will be carried out as a crown thinning; reducing the basal area to approximately 80 ft<sup>2</sup> /acre and relative density to 60%. The harvest will yield approximately 3,100 board feet/acre.

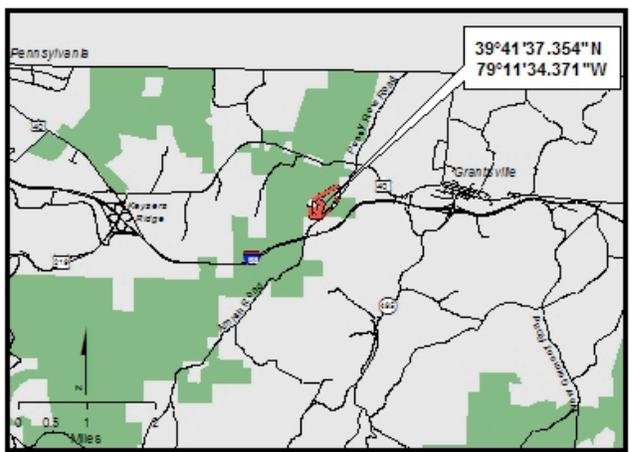


-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**





-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**



**Description/Resource Impact Assessment**

**Location:** This 22-acre harvest proposal is situated adjacent to an existing forest access road located approximately 3.6 miles southwest of the intersection of Amish Road and State Route 40 within Compartment 7, Stand 38 of the Savage River State Forest.

**Forest Community Type and Condition:** This 21-acre site contains a mixed oak stand that is approximately 83 years old, with an average merchantable diameter of 14.2 inches. The over story is dominated by red oak (50%), red maple (37%), white oak (16%) and black cherry (3%). This stand is over stocked at 90% relative density and has an average basal area of 142 ft<sup>2</sup>/acre. Desirable regeneration present in this stand is lacking in part due to the presence of the interfering elements explained in the following section.

**Interfering Elements:** Deer browse pressure in this area is estimated to be moderate and must be addressed when considering regeneration efforts on this site. Interfering understory plant competition is sufficient to cause significant interference with regeneration efforts with 88% of the site containing some form of significant interference. Tall woody interference occupies approximately 42% of the stand consisting primarily of sweet birch and black gum. Low woody interference occupies approximately 78% of the site, with witch hazel making up the majority. Interfering fern levels were recorded on 46% of the site. Non native and invasive species were not found within this stand.

**Historic Conditions:** State Forest records indicate that no silvicultural work has been conducted in this stand since state acquisition. The adjacent stand to the north was thinned in 2001 and a gypsy moth salvage regeneration harvest was implemented in the stand on the northeast boundary of this proposal in 1998. No evidence of fire was observed during the recon. No sign of significant insect infestation was observed at time of recon.

**Rare, Threatened and Endangered Species:** At this time, the Forest Manager knows of no rare, threatened or endangered species on the site, or any species that would be impacted by the silvicultural prescription.

**Habitats and Species of Management Concern:** At this time, the Forest Manager knows of no habitats or species of management concern on site or any species that would be impacted by the silvicultural prescription.

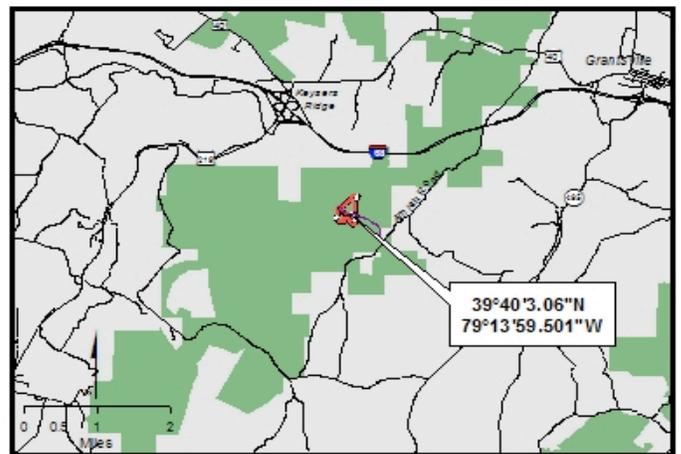
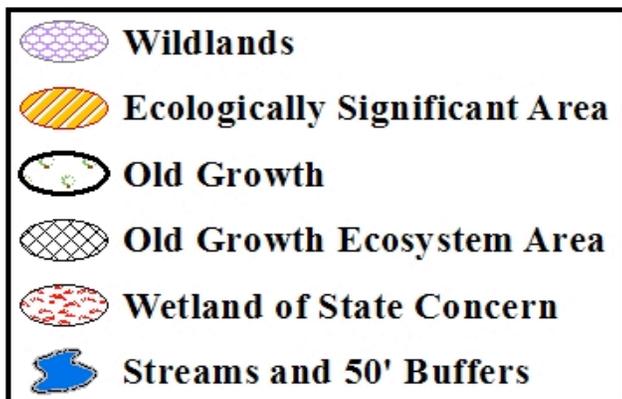
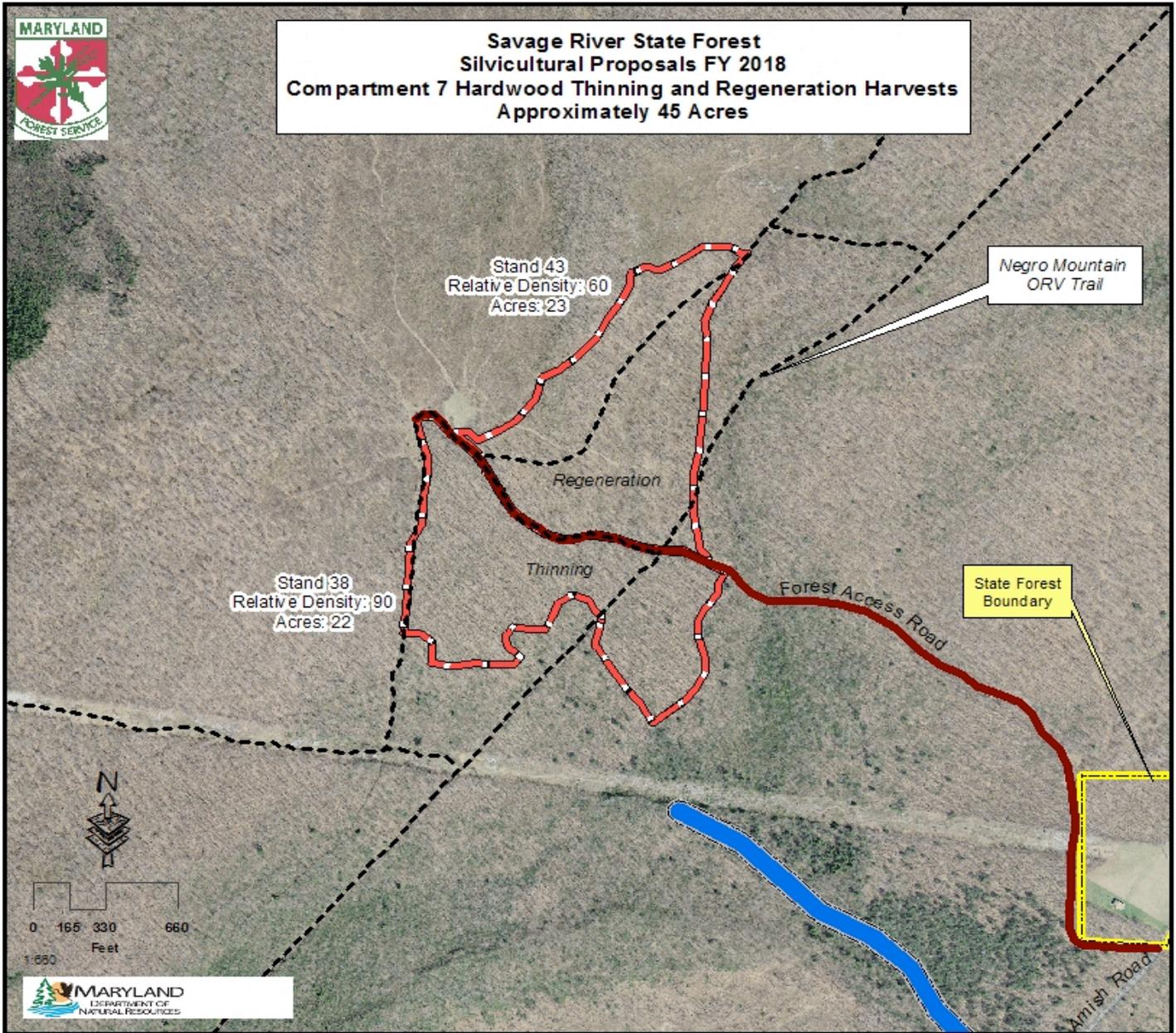
**Water Resources:** The northern portion of this ridge top stand drains east toward Tarkiln Run, while the southern portion drains toward Alexander Run; both within the Casselman River Watershed. The proposed silvicultural treatments will be outside of all HCVF and stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

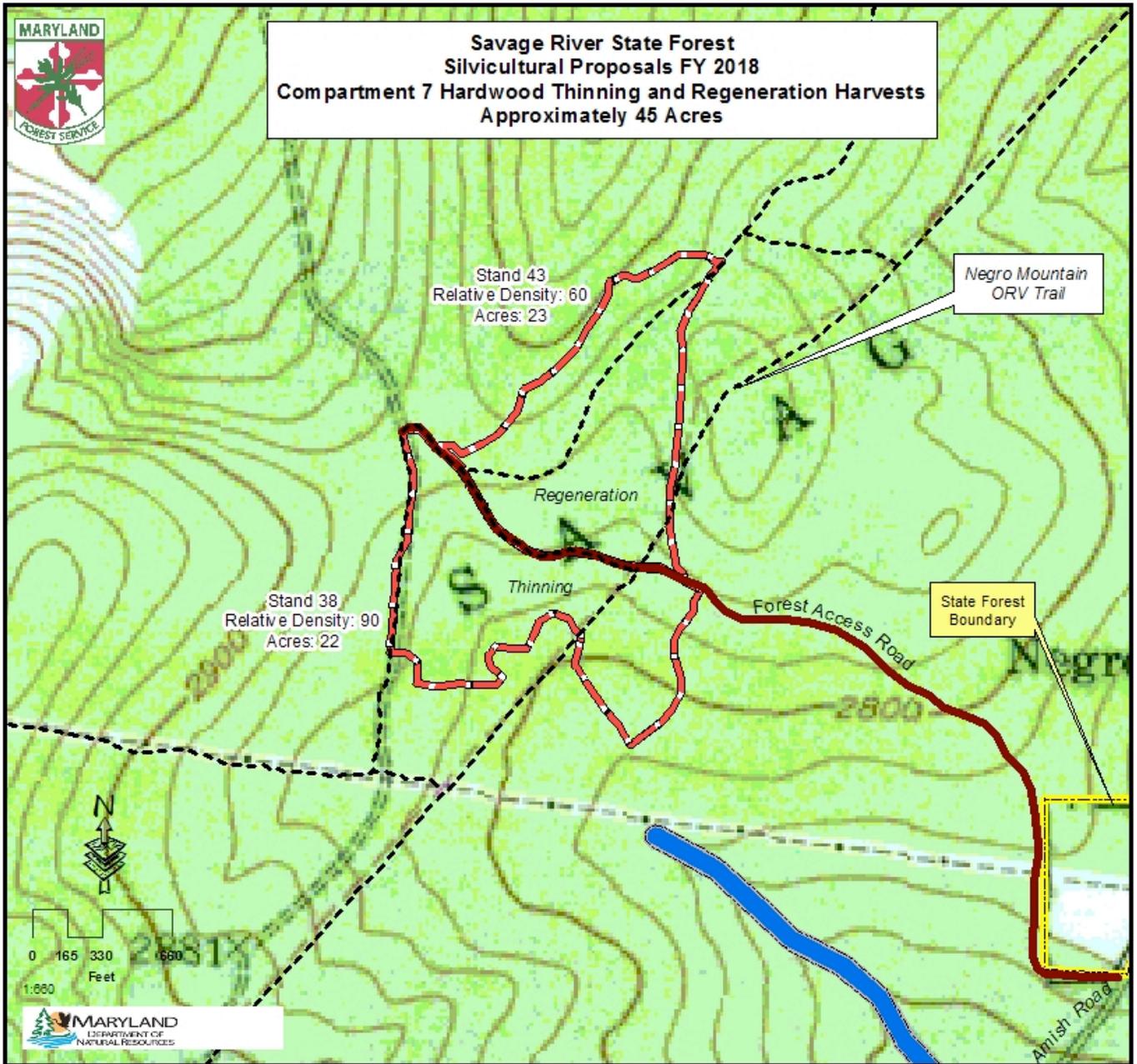
**Soil Resources:** Underlying soils are mapped as Cookport and Ernest very stony silt loams (CuD). These soils are generally moderately deep and well drained with inclusions of some poorly drained soils. Degree of slope ranges from 8-25% throughout the site. Equipment limits are moderate due to a water table that is fairly close to the soil surface in late winter and early spring. Hazard of erosion is slight to moderate. The site has very good productivity for woodland management, with a site index of 75-85 for upland oaks. The productivity of the site will be protected by minimizing the haul roads and skid trails as per the Department's Best Management Practices and rutting guidelines.

**Recreational Resources:** The forest access road that will be utilized as a haul road for the timber harvest serves as part of the Negro Mountain Snowmobile Trail. Access to the trail may be limited and/or suspended for the duration of the harvest depending on the timing of the cutting. Hunting is also a popular activity in this area as the forest road provides a multitude of access points into the state forest. Opportunities to hunt the area may also be limited or disrupted as log trucks and heavy equipment enter/exit the area.

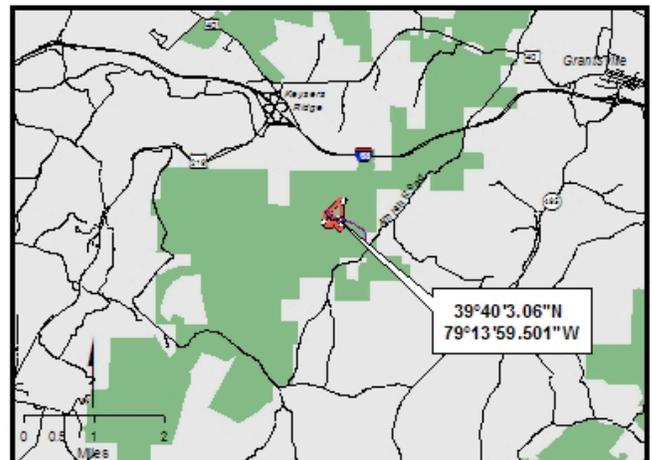
### **Management and Silvicultural Recommendations**

The planned silvicultural treatment for this stand is a thinning given that established regeneration levels are minimal and the stand is overstocked. Thinning the stand will reduce the stocking levels thereby reducing competition and will provide more growing space for the higher quality trees. The crown thinning will reduce the average basal area to 100 ft<sup>2</sup>/acre and the relative density to approximately 60% and will yield approximately 2,500 – 3,000 board feet/acre.





-  Wildlands
-  Ecologically Significant Area
-  Old Growth
-  Old Growth Ecosystem Area
-  Wetland of State Concern
-  Streams and 50' Buffers



**Description/Resource Impact Assessment**

**Location:** This 23-acre harvest proposal is situated adjacent to an existing forest access road located approximately 3.6 miles southwest of the intersection of Amish Road and State Route 40 within Compartment 7 Stand 43 of the Savage River State Forest.

**Forest Community Type and Condition:** This 23-acre site contains a small sawtimber hardwood stand that is approximately 80 years old, with an average merchantable diameter of 13.0 inches. The over story is dominated by red maple (40%), red oak (33%), black birch (12%) and black cherry (11%). The relative density of the stand is 60% and the average basal area of the stand is 74 ft<sup>2</sup>/acre. The stand was thinned in heavily in 2001. The stocking levels of the stand are optimum for individual tree growth, but the majority of the residual trees (52%) are classified as unacceptable growing stock. Desirable competitive oak regeneration is present on 29% of the site and all established and competitive regeneration occupies 75% of the site.

**Interfering Elements:** Deer browse pressure in this area is estimated to be moderate and must be addressed when considering regeneration efforts on this site. Interfering understory plant competition is sufficient to cause significant interference with regeneration efforts with 82% of the site containing some form of significant interference. Tall woody interference, which occupies approximately 57% of the stand, is primarily sweet birch and witch hazel. Low woody interference occupies approximately 86% of the site, and includes sweet birch, witch hazel and choke cherry. Non-native invasive species were not found on site include.

**Historic Conditions:** State Forest records show this stand was thinned in 2001. No evidence of fire was observed during the recon. No sign of significant insect infestation was observed at time of recon.

**Rare, Threatened and Endangered Species:** At this time, the Forest Manager knows of no rare, threatened or endangered species on the site, or any species that would be impacted by the silvicultural prescription.

**Habitats and Species of Management Concern:** At this time, the Forest Manager knows of no habitats or species of management concern on site or any species that would be impacted by the silvicultural prescription.

**Water Resources:** This stand drains east beyond its boundaries into Spiker Run, within the Casselman River Watershed. The proposed silvicultural treatments will be outside of all HCVF and stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

**Soil Resources:** Underlying soils are mapped as Cookport and Ernest very stony silt loams (CuD). These soils are generally moderately deep and well drained with inclusions of some

poorly drained soils. Degree of slope ranges from 8-25% throughout the site. Equipment limits are moderate due to water table that is fairly close to the soil surface late in winter and early spring. Hazard of erosion is slight to moderate. The site has very good productivity for woodland management, with a site index of 75-85 for upland oaks. The productivity of the site will be protected by minimizing the haul roads and skid trails as per the Department's Best Management Practices and rutting guidelines.

**Recreational Resources:** The forest access road that will be utilized as a haul road for the timber harvest serves as part of the Negro Mountain Snowmobile Trail. Access to the trail may be limited and/or suspended for the duration of the harvest depending on the timing of the cutting. Hunting is also a popular activity in this area as the forest road provides a multitude of access points into the state forest. Opportunities to hunt the area may also be limited or disrupted as log trucks and heavy equipment enter/exit the area.

### **Management and Silvicultural Recommendations**

The heavy thinning that was conducted in 2001 has effectively served as the seed cut / establishment stage of a shelter wood system providing sufficient desirable advanced regeneration to merit the removal of the overstory. Moreover, the percentage of acceptable growing stock in the stand is not adequate enough to provide a future stand of desirable quality. Given these factors, this stand will be regenerated using a clear cut with variable retention. All trees greater than 4" DBH will be harvested, excepting 4-8 dominant or co-dominant trees per acre selected for mast production/seed sources or wildlife habitat elements including cavities or dens. This harvest will serve as a liberation cut, releasing the established regeneration, allowing the new crop of trees to fully develop into the next stand. Contract specifications will require high slash to remain on the harvest site in order to deter from deer browsing on developing seedlings and stump sprouts.

### Description/Resource Impact Assessment

**Location:** This harvest proposal is located 0.4 miles south of Rabbit Hollow Road at the terminus of a forest access road located 1.0-mile south of the intersection of Rabbit Hollow Road and State Route 219 in Compartment 11 Stand 21 of Savage River State Forest.

**Forest Community Type and Condition:** This 21-acre site contains a mature mixed oak stand that is approximately 100 years old with an average merchantable diameter of 16.2 inches. The over story contains chestnut oak (53%), red maple (24%), red oak (18%) and black cherry (4%). This stand is overstocked at 120% relative density and the average basal area of the stand is 152 ft<sup>2</sup>/acre. The understory contains little advanced regeneration with only nine percent of the stand containing established regeneration.

**Interfering Elements:** Deer browse pressure in this area is estimated to be moderate to high and must be addressed when considering regeneration efforts on this site. Approximately 50% of the site contains some form of interfering vegetation prohibiting seedling establishment. 45% of the stand contains tall woody interference primarily in the form of black birch, American beech and witch hazel. Low woody interference occupies 82% of the stand and populations of problematic ferns are found on 5% of the site. Non-native invasive species were not observed in the stand.

**Historic Conditions:** State Forest records show no history of harvest since state acquisition, but the adjacent stand to the east was harvested in 1998. No evidence of fire or insect pest activity was observed during the recon.

**Rare, Threatened and Endangered Species:** At this time the Forest Manager knows of no rare, threatened or endangered species on the site, or any species that would be impacted by the silvicultural prescription.

**Habitats and Species of Management Concern:**

At this time, the Forest Manager knows of no critical habitats or species of management concern on the site or any species that would be impacted by the silvicultural prescription.

**Water Resources:** This stand drains west into an unnamed tributary of Little Bear Creek that lies within the Youghiogheny River Watershed. The proposed silvicultural treatments will be outside of all HC VF stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

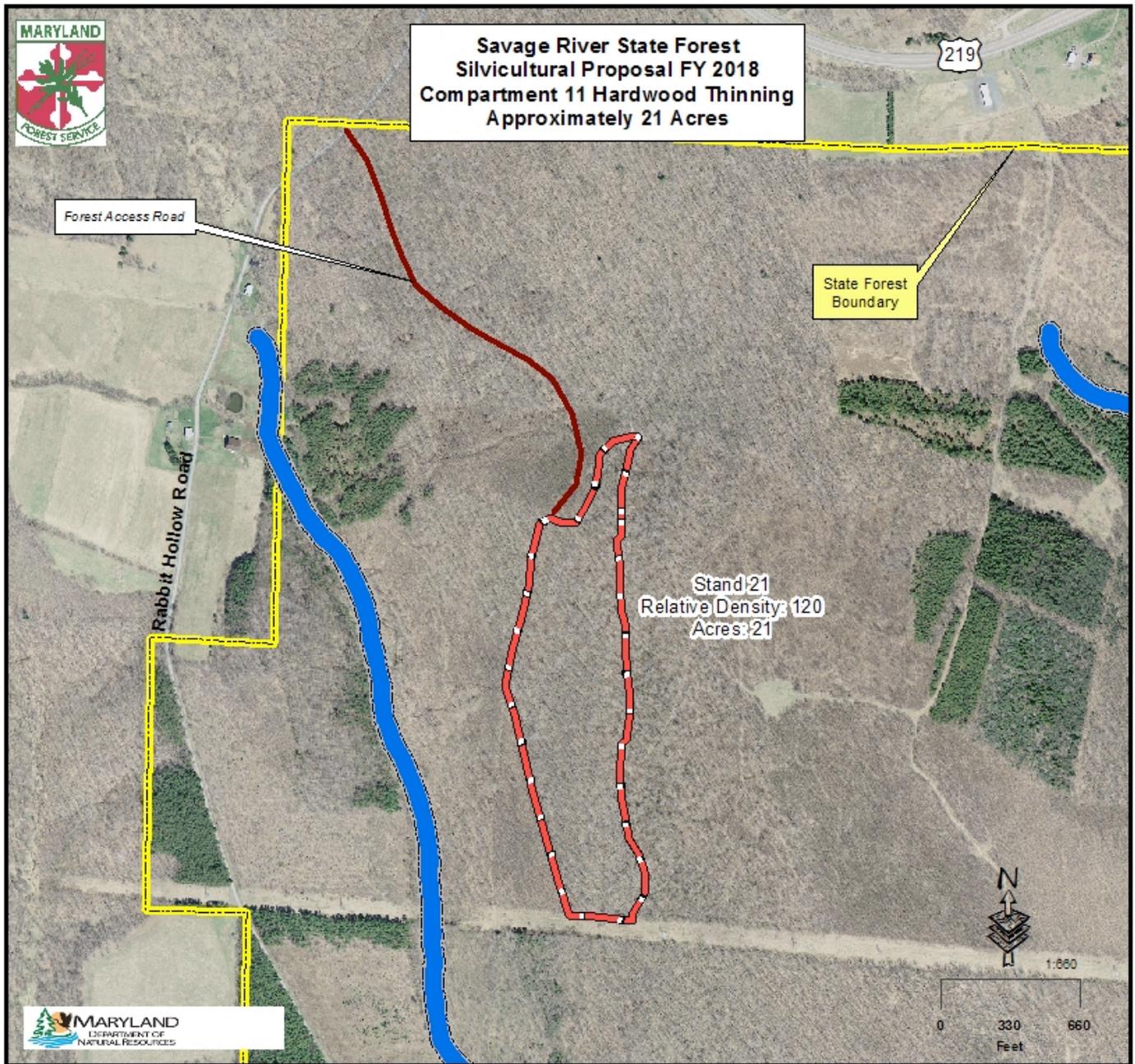
**Soil Resources:** The dominant soil type of this proposal is stony land, steep (SrF). These soils are well-drained and have a high potential for erosion on steeper slopes. Degree of slope ranges from 25-35% throughout the site. The site has good productivity for woodland management, with a site index of 65-75 for upland oaks. The productivity of the site will be protected by

minimizing the haul roads and skid trails as per the Department's Best Management Practices and rutting guidelines.

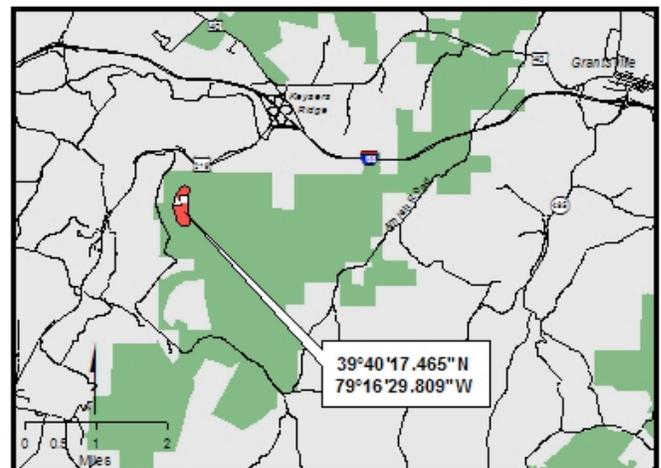
**Recreation Resources:** Hunting is the prevalent recreational activity undertaken in the area of the potential harvest site. Opportunities for hunting in this area may be limited or disrupted depending on the timing of the harvest activities.

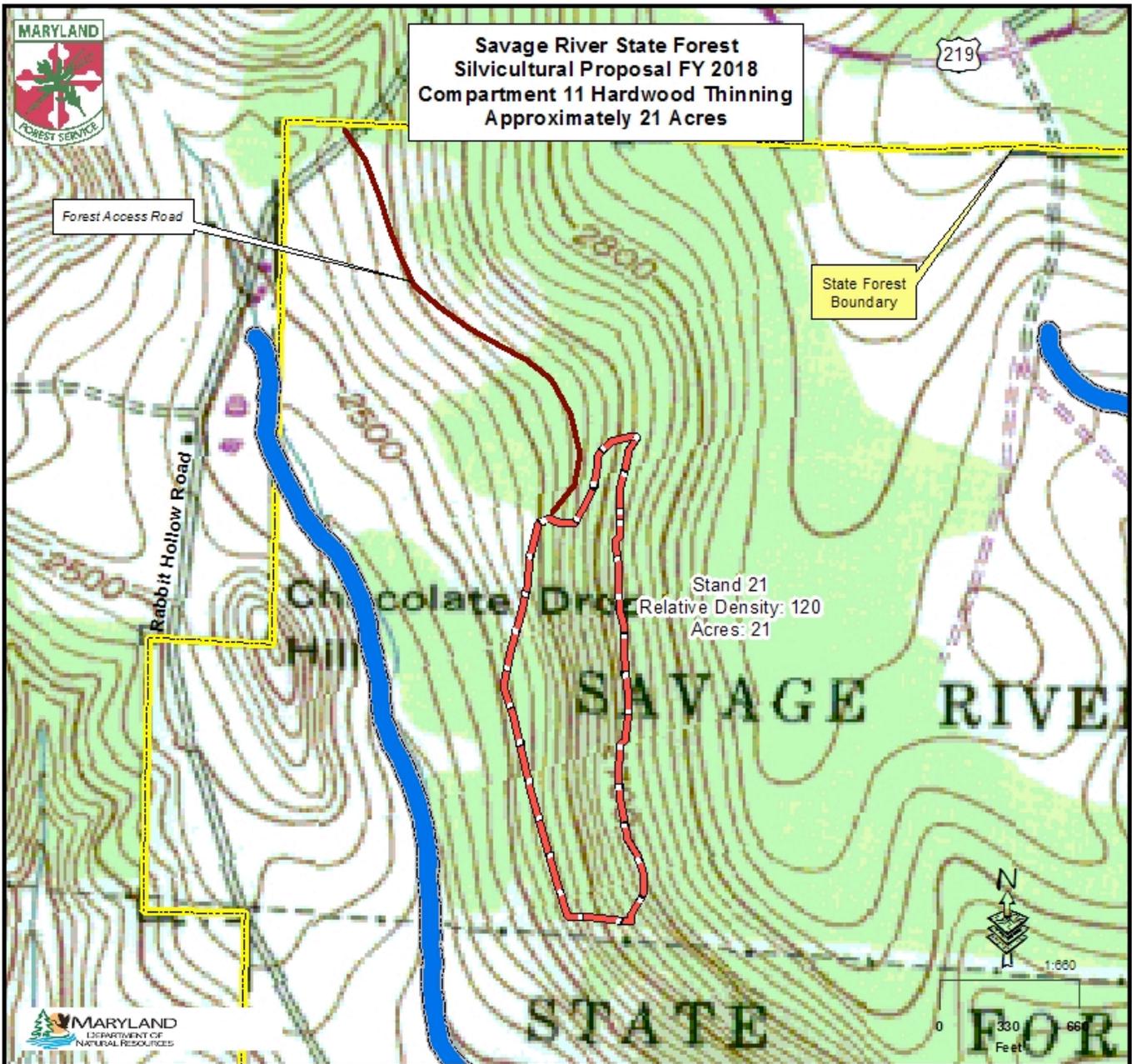
### **Management and Silvicultural Recommendations**

The planned silvicultural treatment for this site is a thinning as competitive regeneration is lacking and the stand is overstocked. The crown thinning will remove approximately 50 ft<sup>2</sup> of basal area/acre and yielding approximately 3,500 - 4,000 board feet/acre. Harvesting will focus on the removal of poles, unacceptable growing stock and individual trees that have reached maturity, reducing the relative density to approximately 78%. Stand growth will be concentrated on the small and medium size sawtimber retained in the stand.

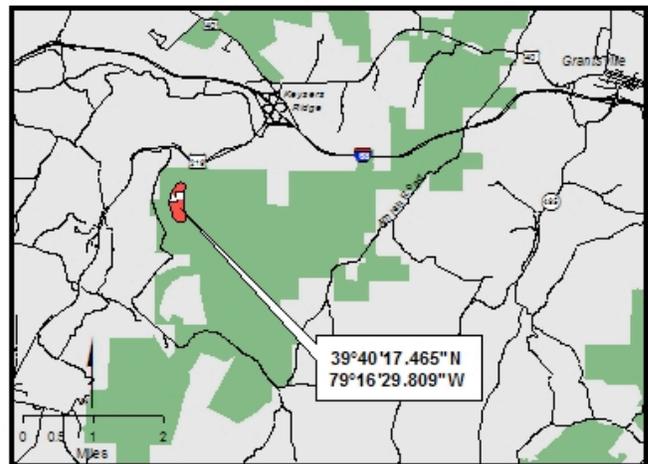


-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**





-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**



**Description/Resource Impact Assessment**

**Location:** This area is south of Bowman Hill Road off a forest access road located approximately 1.6 miles west of the junction of Bowman Hill Road and Amish Road in Compartment 13 Stand 6 of the Savage River State Forest.

**Forest Community Type and Condition:** This 31-acre site contains a mature northern hardwood stand that is approximately 100 years old, with an average merchantable diameter of 16.1 inches. The overstory contains yellow poplar (41%), red oak (19%), sugar maple (14%) and red maple (14%). This stand is understocked at 62% relative density and contains 100 ft<sup>2</sup> of basal area/acre. There is very little desirable regeneration present in the understory due in part to the amount of interfering elements noted below.

**Interfering Elements:** Deer browse pressure in this area is estimated to be moderate to high and must be addressed when considering regeneration efforts on this site. Interfering understory plant competition is sufficient to cause significant interference with regeneration efforts with 70% of the site containing some form of significant interference. Tall woody interference occupies approximately 67% of the stand, is comprised primarily of striped maple and sweet birch. Low woody interference occupies approximately 3% of the site, consisting of striped maple. Interfering ferns and grasses were treated with herbicide in the summer of 2014 and therefore are not an interfering agent preventing regeneration establishment. Non-native invasive species (NNIS) were not observed during the stand inventory.

**Historic Conditions:** State Forest records show this stand was thinned in 1992. No evidence of fire was observed within the stand. No sign of significant insect infestation was observed during the assessment of the stand.

**Rare, Threatened and Endangered Species:** At this time, the Forest Manager knows of no rare, threatened or endangered species on the site, or that would be impacted by the silvicultural prescription.

**Habitats and Species of Management Concern:** At this time, the Forest Manager knows of no habitats or species of management concern on the site or any species that would be impacted by the silvicultural prescription.

**Water Resources:** This stand drains west into Bear Creek within the Youghiogheny River Watershed. The proposed silvicultural treatments will be outside of all HCVF and stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

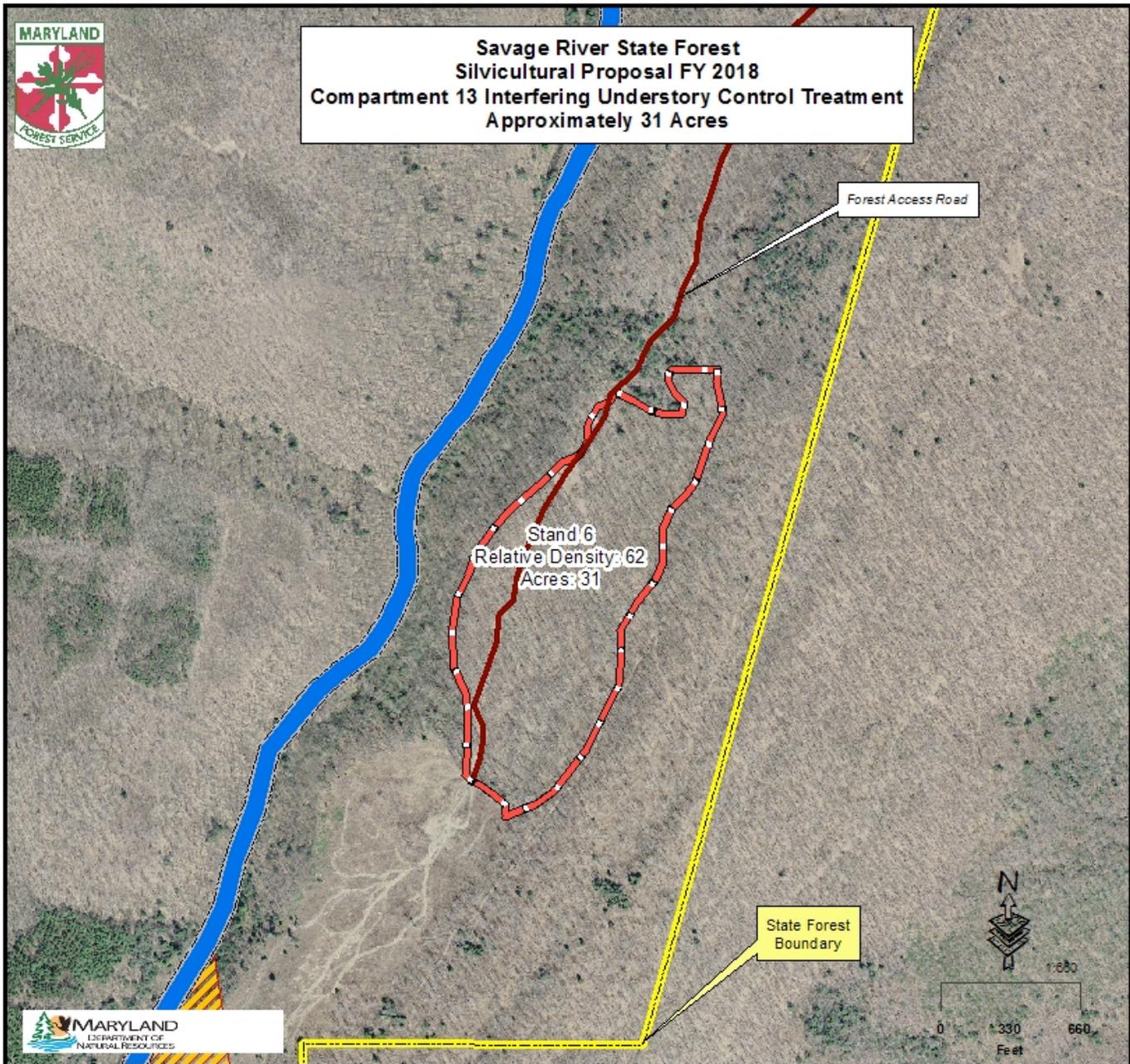
**Soil Resources:** Underlying soils are mapped as Dekalb – Calvin-Lehew very stony loams (DcD). These soils are generally moderately deep and well drained with inclusions of some poorly drained soils. Degree of slope ranges from 0-25% throughout the site. Equipment limits

range from slight to moderate, where slopes exceed 15%. Hazard of erosion is slight to moderate. The site has good productivity for woodland management, with a site index of 65-75 for upland oaks.

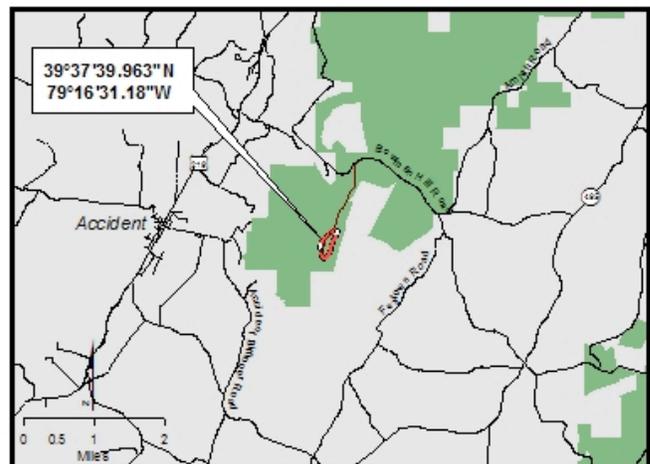
**Recreation Resources:** No developed recreational resources are located within the stand. The access road for the stand is primarily utilized for hunting access. The recommended prescription for this stand does not include any mechanical harvesting of any wood products and therefore will not limit hunting opportunities as the project is being completed.

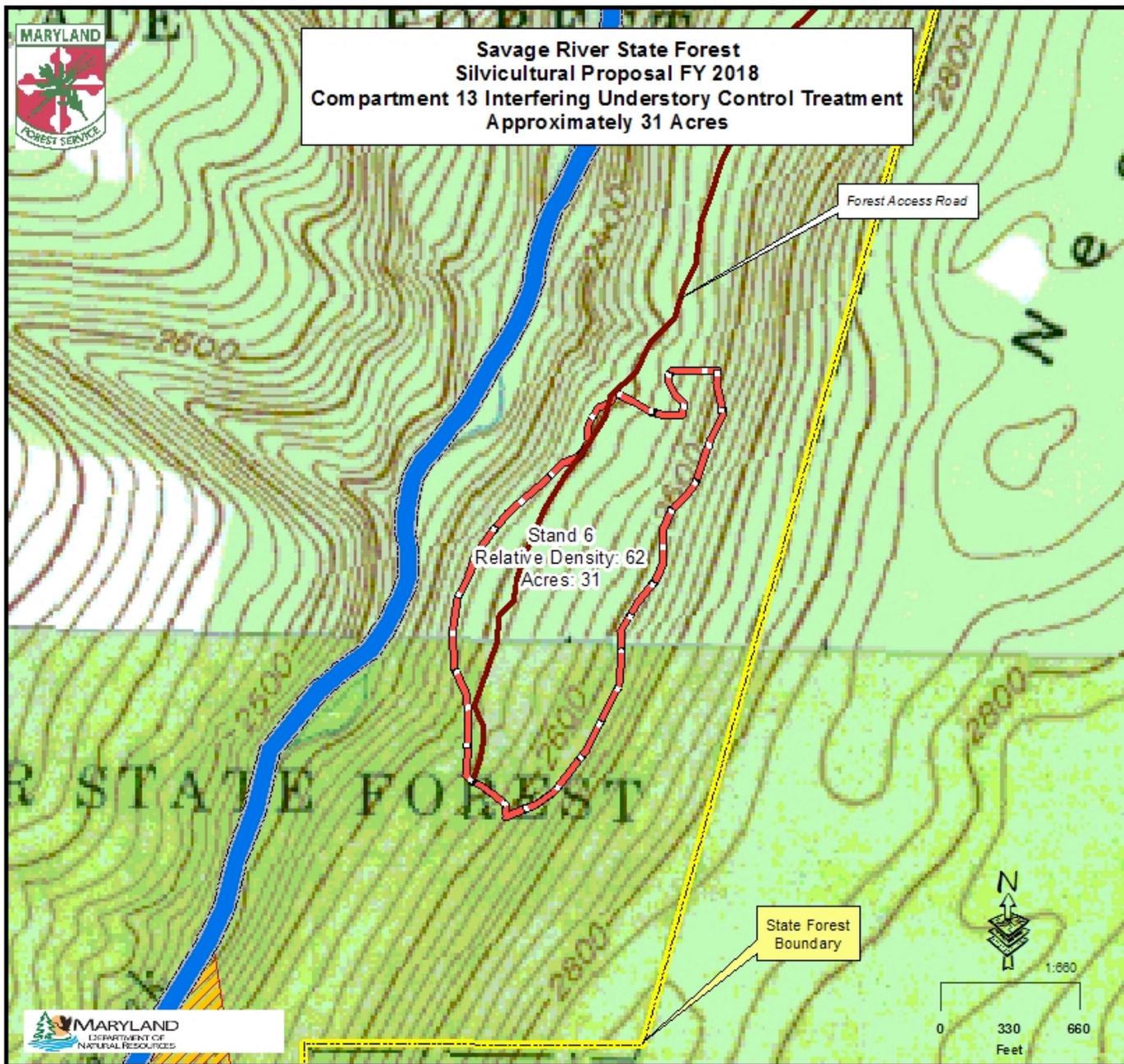
### **Management and Silvicultural Recommendations**

This stand has reached maturity and normally a regeneration prescription would be appropriate, but due to the lack of established regeneration and the presence of significant tall woody interference, the planned prescription for this stand is to control the interfering vegetation in order to facilitate the establishment of desirable regeneration. The interfering woody vegetation 0.5”- 6” will be eliminated using a low volume, direct application of an appropriate herbicide applied to the target trees using either cut surface, hack and squirt or basal bark application techniques. This will open the forest floor to increased diffuse sunlight necessary for desired seedling establishment. Following the herbicide treatment, the stand will be monitored annually for acceptable regeneration establishment. Depending on the regeneration response to the treatment, a shelterwood harvest may be required to facilitate the growth into a competitive cohort. When the regeneration reaches competitive size and can provide a fully stocked stand a final removal harvest will be implemented.

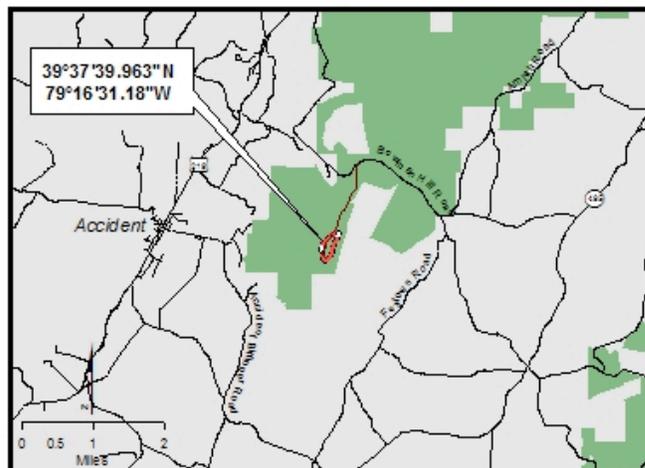


-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**





- Wildlands
- Ecologically Significant Area
- Old Growth
- Old Growth Ecosystem Area
- Wetland of State Concern
- Streams and 50' Buffers



**Description/Resource Impact Assessment**

**Location:** This stand is situated on the south side of Swamp Road, approximately 1.0 mile east of the junction of Swamp Road and Westernport Road within Compartment 36 Stand 0 of the Savage River State Forest.

**Forest Community Type and Condition:** This 34-acre site contains an 84-year-old mixed oak stand. The over story consists of northern red oak (51%), red maple (29%), black cherry (8%), and sugar maple (3%) with an average merchantable diameter of 14.5". This stand is over stocked at 93% relative density and the basal area averages 147 ft<sup>2</sup>/acre. There is insufficient desirable regeneration present with less than 20% of the area containing adequate competitive desirable regeneration.

**Interfering Elements:** Deer browse pressure in this area is estimated to be moderate and must be addressed when considering regeneration efforts on this site. Significant interfering plant competition is present over 100% of the site, limiting the establishment of desirable regeneration. Tall woody interference is found over 98% of the stand consisting largely of witch hazel, sweet birch and striped maple. Non-native invasive species (NNIS) were not observed during the inventory. No significant insect pest or diseases were observed.

**Historic Conditions** There is no record of harvest in the stand since the states acquisition. No evidence of recent fire activity was observed within the stand.

**Rare, Threatened and Endangered Species:** The Forest Manager knows of no rare, threatened or endangered species on the site, or that would be impacted by the silvicultural prescription.

**Habitats and Species of Management Concern:** The Savage Ravines Wildlands and Old Growth Ecosystem Area are adjacent to the northern boundary of the stand. The proposed harvest site and the wildlands are separated by a paved county road. All proposed silvicultural activities will occur outside the designated boundaries of this particular HCVF and will have no impact upon its present condition. Additionally, a large rock outcrop is located on eastern portion of the management unit. This feature will be buffered accordingly to protect the unique habitat niche that it provides.

**Water Resources:** This stand drains north approximately 1,400' to Swamp Run, part of the Savage River Watershed. The proposed silvicultural treatments will be outside of all HCVF stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

**Soil Resources:** Underlying soil type is mapped as Stony land, steep (SrF). This soil is generally moderately deep over bedrock and well drained. Degree of slope ranges from 0-35% throughout the site. Equipment limits range from slight to moderate, moderate to severe on slopes over 35%. Hazard of erosion is slight to moderate on steeper slopes. The site has very good

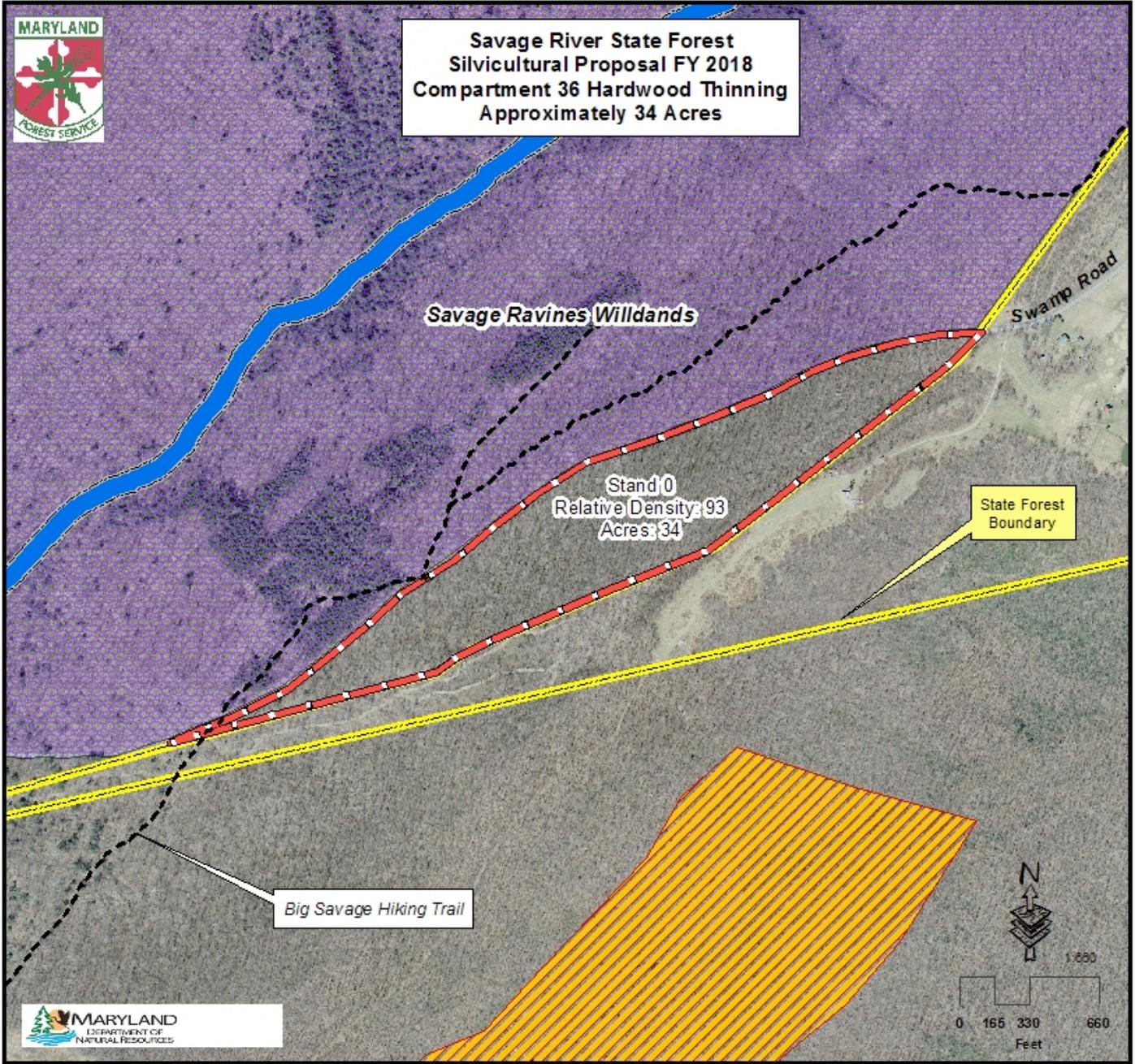
productivity for woodland management, with a site index of 75-85 for upland oaks on north aspects. This soil type provides excellent watershed protection and habitat for wildlife. The productivity of the site will be protected by minimizing the haul roads and skid trails as per the Department's Best Management Practices and rutting guidelines.

**Recreation Resources:** No developed recreational resources are located within the stand. Hunting is the main form of recreation that occurs within the management unit. Opportunities for hunting in this area may be limited or disrupted depending on the timing of the harvest activities. The Big Savage Hiking Trail is located north of the proposed harvest area and crosses the far westernmost portion of the sale area. Contract stipulations will require that the trail will be free of logging debris at the completion of the harvest. Temporary closure of the trail may be necessary during the harvest in order to ensure visitor safety.

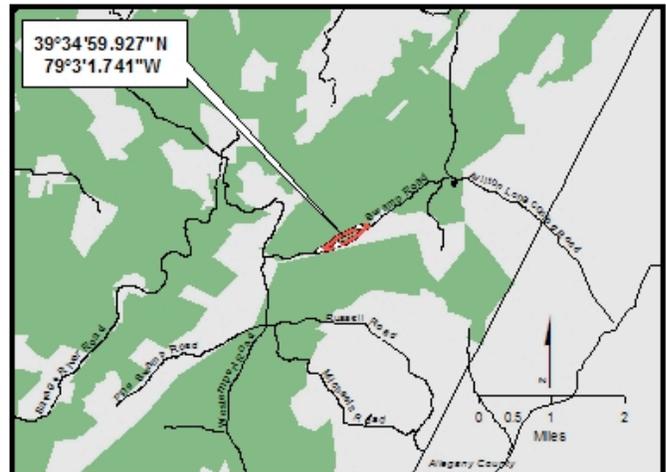
### **Management and Silvicultural Recommendations**

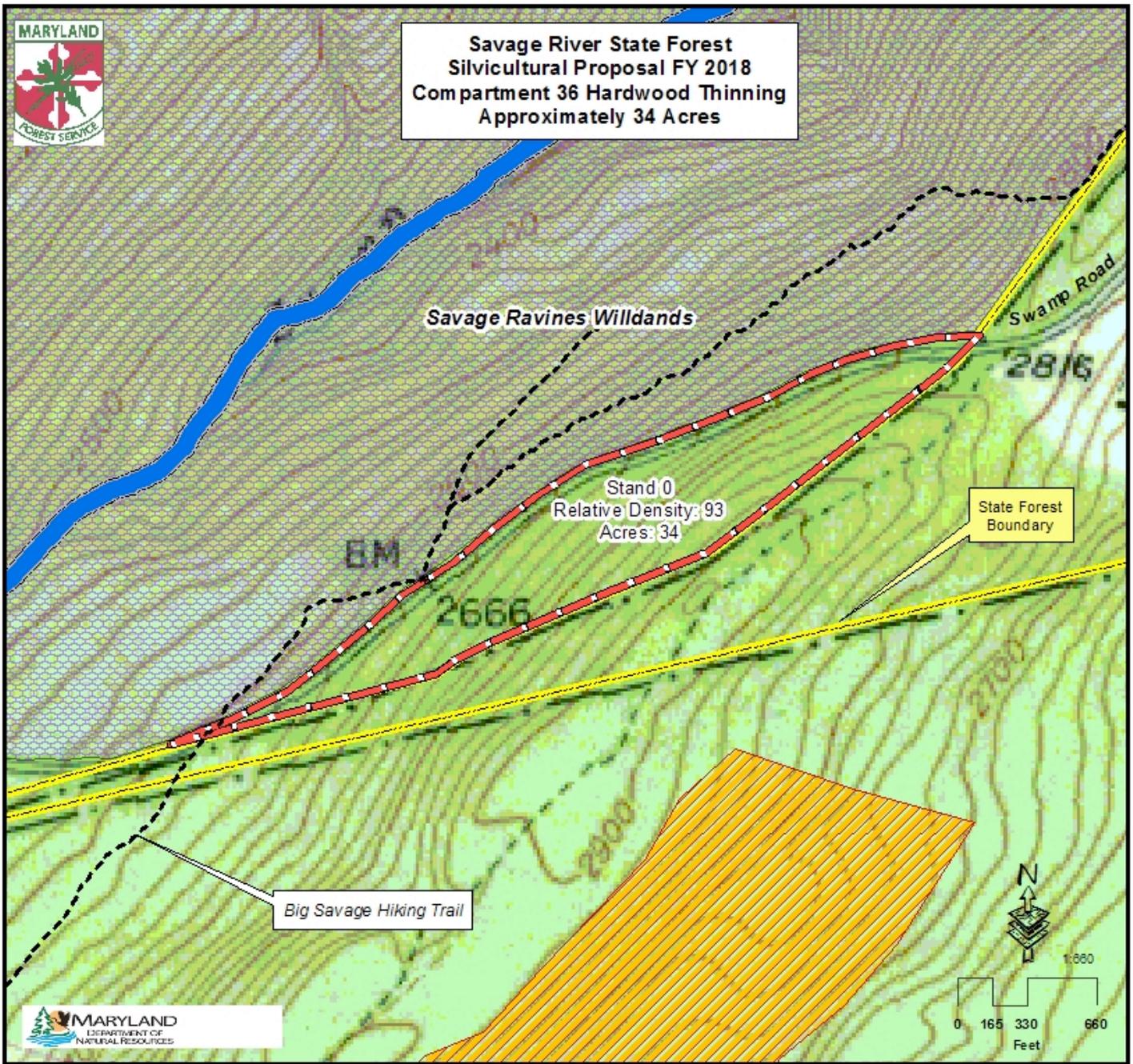
The planned silvicultural treatment for this site involves a multi-stage shelterwood sequence to regenerate the stand. The first stage of this regeneration system will be an establishment cut that will involve both thinning the stand and treating the interfering understory plants that are limiting seedling development, in order to provide suitable conditions for seed production and seedling establishment. Retention will focus on the oak species for acorn production and black cherry to provide a mast crop. A crown thinning will be conducted to reduce the residual basal area to approximately 90 ft<sup>2</sup>/acre and reduce the relative density of the stand to 60%. This harvest will yield approximately 3,500 board feet/acre.

In advance of the harvest operation, all interfering tall woody vegetation 0.5-6" will be controlled using a low volume, direct application of an appropriate herbicide using either cut surface, hack and squirt or basal bark application techniques. Removal of this interfering layer will open the forest floor to increased sunlight necessary for desired seedling establishment. After completion of the harvest, the stand will be monitored for acceptable levels of desired established regeneration. Depending on the regeneration response to the treatment, further interfering vegetation control may be necessary or a second shelterwood harvest may be implemented. Following establishment of desirable competitive regeneration, a final removal harvest will be conducted.

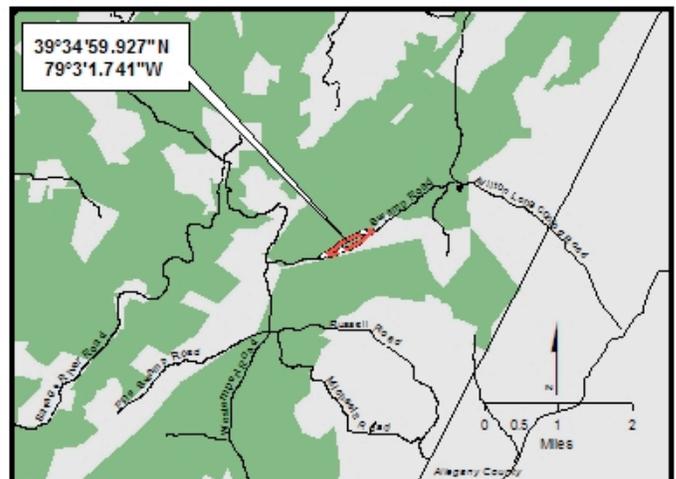


-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**





-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**



**Description/Resource Impact Assessment**

**Location:** This 115-acre stand is located on the west side of Big Savage Mountain approximately one mile northeast of Avilton-Lonaconing Road within Compartment 37 Stands 23 and 24 of Savage River State Forest. Access to the stand is via an existing forest road off Red Dog Road located approximately 2.0 miles northeast of the intersection of Red Dog Road and Avilton-Lonaconing Road.

**Forest Community Type and Condition:** This management unit consists of a mature mixed oak stand that is approximately 115 years old, with an average merchantable diameter of 15.4 inches. Stand composition is dominated by northern red oak (54%) followed by red maple (21%), chestnut oak (8%) and eastern hemlock (9%). The stand is overstocked at 113% relative density and contains an average basal area of 171 ft<sup>2</sup>/acre. Oak regeneration for all cohorts occupies approximately 25% of the management unit. In order to preserve the current oak regeneration and facilitate growth into a competitive stage, it is imperative that the interfering vegetation be controlled, specifically the tall woody interference.

**Interfering Elements:** Overall, interfering understory plants occupy approximately 90% of the harvest site, which is sufficient to cause significant interference with regeneration efforts. Tall woody interference occupies approximately 75% of the stand and is composed primarily of black birch, striped maple and witch hazel. Low woody interference including witch hazel and striped maple occupies approximately 69% of the management unit. Non-native invasive species (NNIS) were not found on site during the inventory.

In addition to interfering vegetation, the presence of white-tailed deer can have a negative influence on the regeneration success of the stand. Over browsing can facilitate failure of desirable seedling establishment and in extreme cases a shift in species composition dominated by undesirable tree species. Field evaluation of the site estimated deer browse impact to be moderate. Monitoring of deer browse impacts will coincide with regeneration surveys to determine if additional measures need to be implemented to reduce deer herbivory and increase the likelihood of regeneration establishment on the site.

**Historic Conditions:** State Forest harvest records indicate that no previous silvicultural work has been conducted in the stand since state acquisition. No evidence of fire was observed during the recon. No sign of significant insect infestation was observed at time of recon.

**Rare, Threatened and Endangered Species:** At this time, the Forest Manager knows of no rare, threatened or endangered species on the site or any species that would be impacted by the silvicultural prescription.

**Habitats and Species of Management Concern:** At this time, the Forest Manager knows of no habitats or species of management concern on site or any species that would be impacted by the silvicultural prescription. The Callahan Swamp Ecologically Significant Area is situated to the north of the proposal. The site will be unaffected by the harvesting activities proposed.

**Water Resources:** This stand drains west towards the Little Savage River located 1,200' away, within the Savage River watershed. The proposed silvicultural treatments will be outside of all HCVF and stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

**Soil Resources:** Underlying soils are mapped as Stony land, steep. These soils are generally moderately deep over bedrock and well drained. Degree of slope ranges from 15-35% throughout the site. Equipment limits are moderate to severe on slopes exceeding 35%. Hazard of erosion is slight to moderate on steeper slopes. The site has very good productivity for woodland management with a site index of 75-85 for upland oaks on northern aspects. The productivity of the site will be protected by minimizing the haul roads and skid trails as per the Department's Best Management Practices and rutting guidelines.

**Recreation Resources:** No developed recreational resources exist within the management unit. However, the Big Savage Hiking Trail is located along the eastern portion of the proposal and the access road for the harvest will cross a section of the trail. This section of the trail will be posted with cautionary signage to inform forest visitors of possible danger from logging equipment entering and exiting the site. Hunting opportunities may be impacted as well, depending on the timing of the harvest operations.

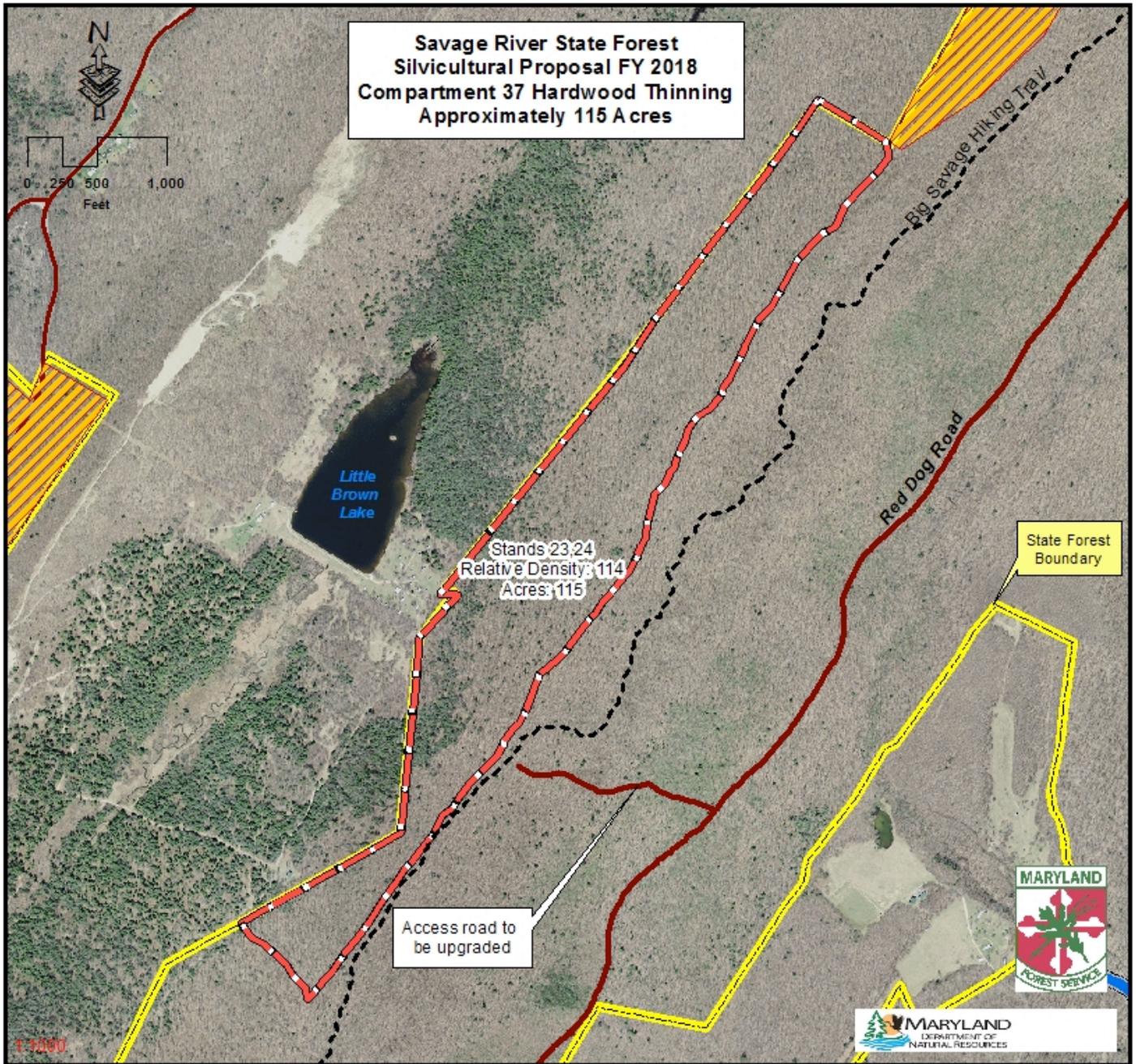
Additionally, Red Dog Road will be utilized as a haul road in completing the harvest. The road is primarily used for hunting access, but preliminary plans are being considered to convert the road into an ORV trail for part of the year. If these plans are implemented within the time frame of the proposed harvest, measures will be taken to ensure the safety of the recreationists as well as the timber harvest operators.

### **Management and Silvicultural Recommendations**

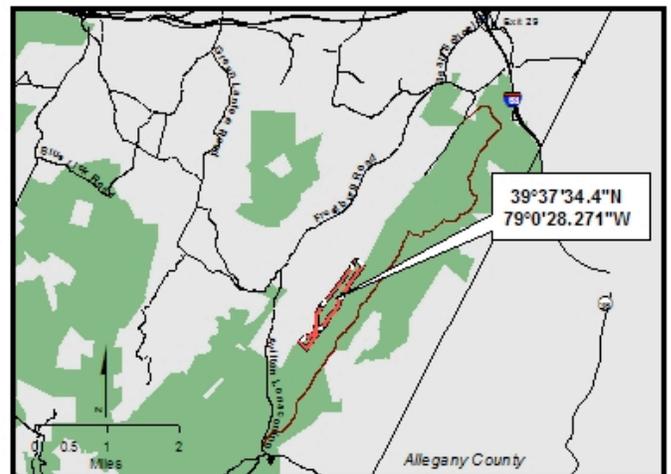
The planned silvicultural treatment for this site involves a multi-stage shelterwood sequence to regenerate the stand. The first stage of this regeneration system will be an establishment cut involving both thinning the stand and treating the interfering understory plants that are limiting seedling development, in order to provide suitable conditions for seed production and seedling establishment. On average, approximately 110 ft<sup>2</sup>/acre of basal area will be retained throughout the stand, reducing the relative density to 74%. Removals will be concentrated on unacceptable/undesirable growing stock and individual trees that have reached maturity. Harvest yields will average 2,500 to 3,000 board feet/acre.

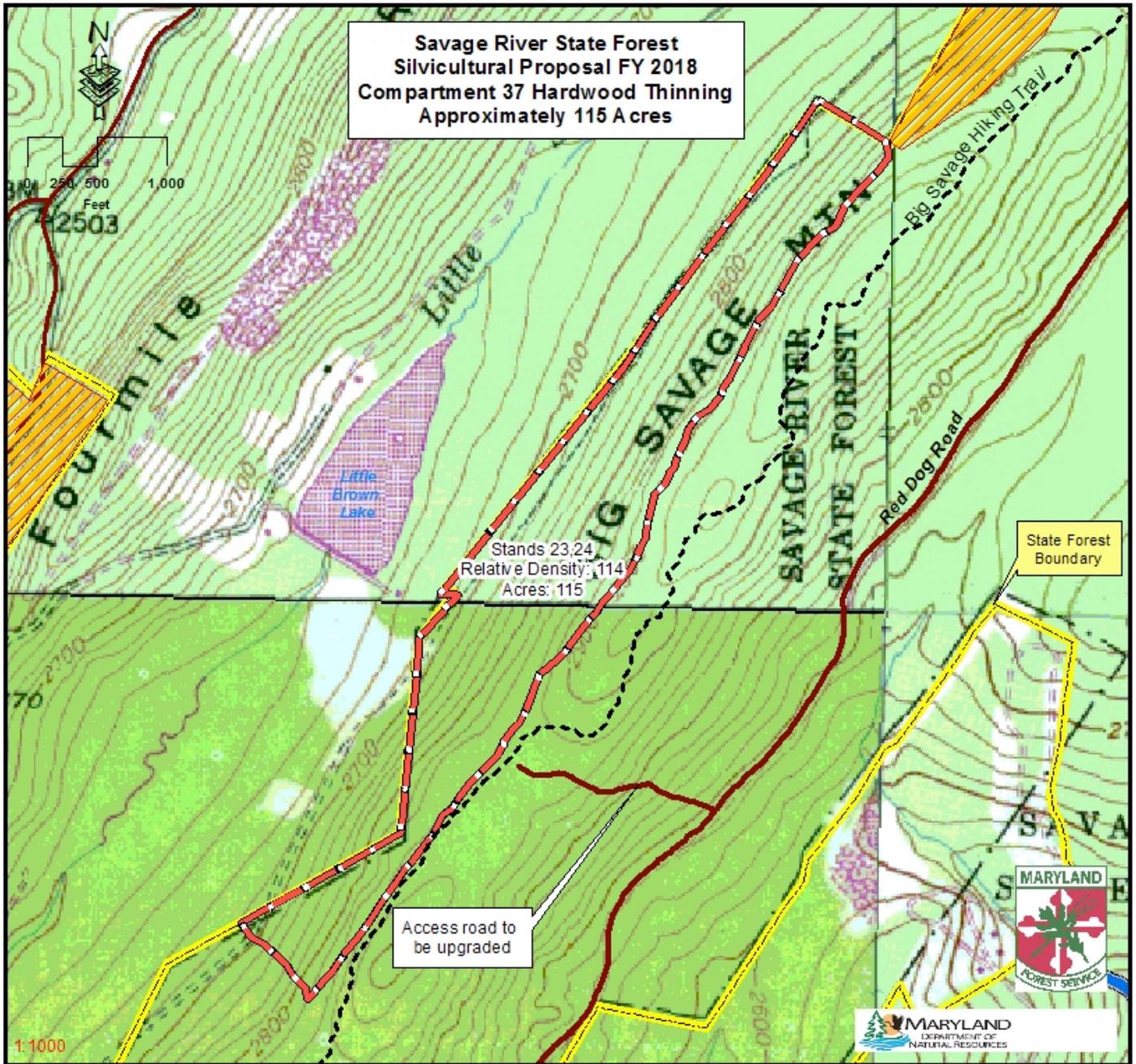
In advance of the harvest operation, all interfering tall woody vegetation 0.5-6" will be controlled using a low volume, direct application of an appropriate herbicide using either cut surface, hack and squirt or basal bark application techniques. Removal of this interfering layer will open the forest floor to increased sunlight necessary for desired seedling establishment.

The stand will be monitored annually for acceptable levels of desired established regeneration. Depending on the regeneration response to the treatment, further interfering vegetation control may be necessary or a second shelterwood harvest may be implemented. Upon the establishment of desirable competitive regeneration, a final removal harvest will be conducted.

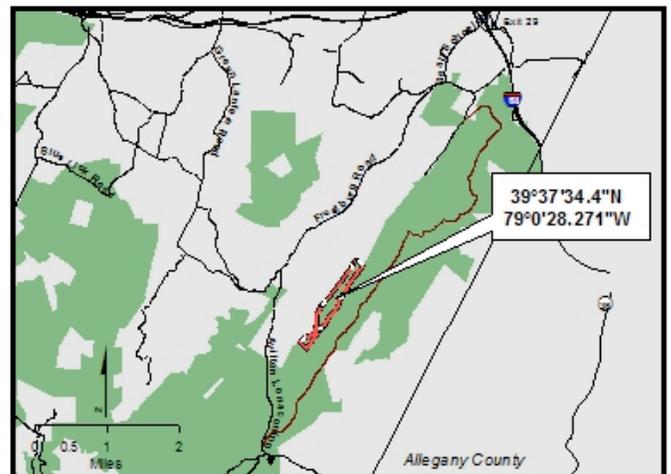


- Wildlands
- Ecologically Significant Area
- Old Growth
- Old Growth Ecosystem Area
- Wetland of State Concern
- Streams and 50' Buffers





-  Wildlands
-  Ecologically Significant Area
-  Old Growth
-  Old Growth Ecosystem Area
-  Wetland of State Concern
-  Streams and 50' Buffers



**Description/Resource Impact Assessment**

**Location:** This 42-acre stand is located on the north side of the St. Johns Rock forest access road approximately 2.3 miles south of the intersection with the St. Johns Rock county road in Compartment 38 Stand 13 of the Savage River State Forest.

**Forest Community Type and Condition:** The management unit consists of a mixed oak stand that is approximately 75 years old, with an average merchantable diameter of 12.8 inches. Stand composition includes red oak (54%), red maple (29%), white oak (6%) and chestnut oak (4%). This stand is over stocked at 93% relative density, and averages 113 ft<sup>2</sup> of basal area per acre. Data collected in 2012 indicated that competitive oak regeneration occupied approximately 39% of the stand and established oak regeneration occupied approximately 11%. Inventory data collected in 2016 shows a precipitous decline in all oak regeneration. Competitive and established oak levels fell to approximately 4% and 9% respectively. Total oak values for all cohorts waned from 50% to 16% in the four-year period.

**Interfering Elements:** Interfering understory plant competition is sufficient to cause significant interference with regeneration efforts with 91% of the site containing some form of significant vegetative interference. The majority of the interfering vegetation is in the form of tall woody interference composed of black birch, striped maple and witch hazel. Low woody interference is not considered problematic as it only occupies 26% of the site. No non-native invasive species (NNIS) were found on site during the inventory.

**Historic Conditions:** A portion of the management unit was acquired in 1996 as part of a 216.5-acre block. Timber management history is not available for the prior ownership, but no silvicultural activities have taken place within the stand since state acquisition. Similarly, no harvest operations have been conducted on the remainder of the stand, according to State Forest records. No evidence of fire or significant insect infestation was observed during the inventory of the stand.

**Rare, Threatened and Endangered Species:** At this time, the Forest Manager knows of no rare, threatened or endangered species on the site, or any species that would be impacted by the silvicultural prescription.

**Habitats and Species of Management Concern:** At this time, the Forest Manager knows of no habitats or species of management concern on site, or any species that would be impacted by the silvicultural prescription.

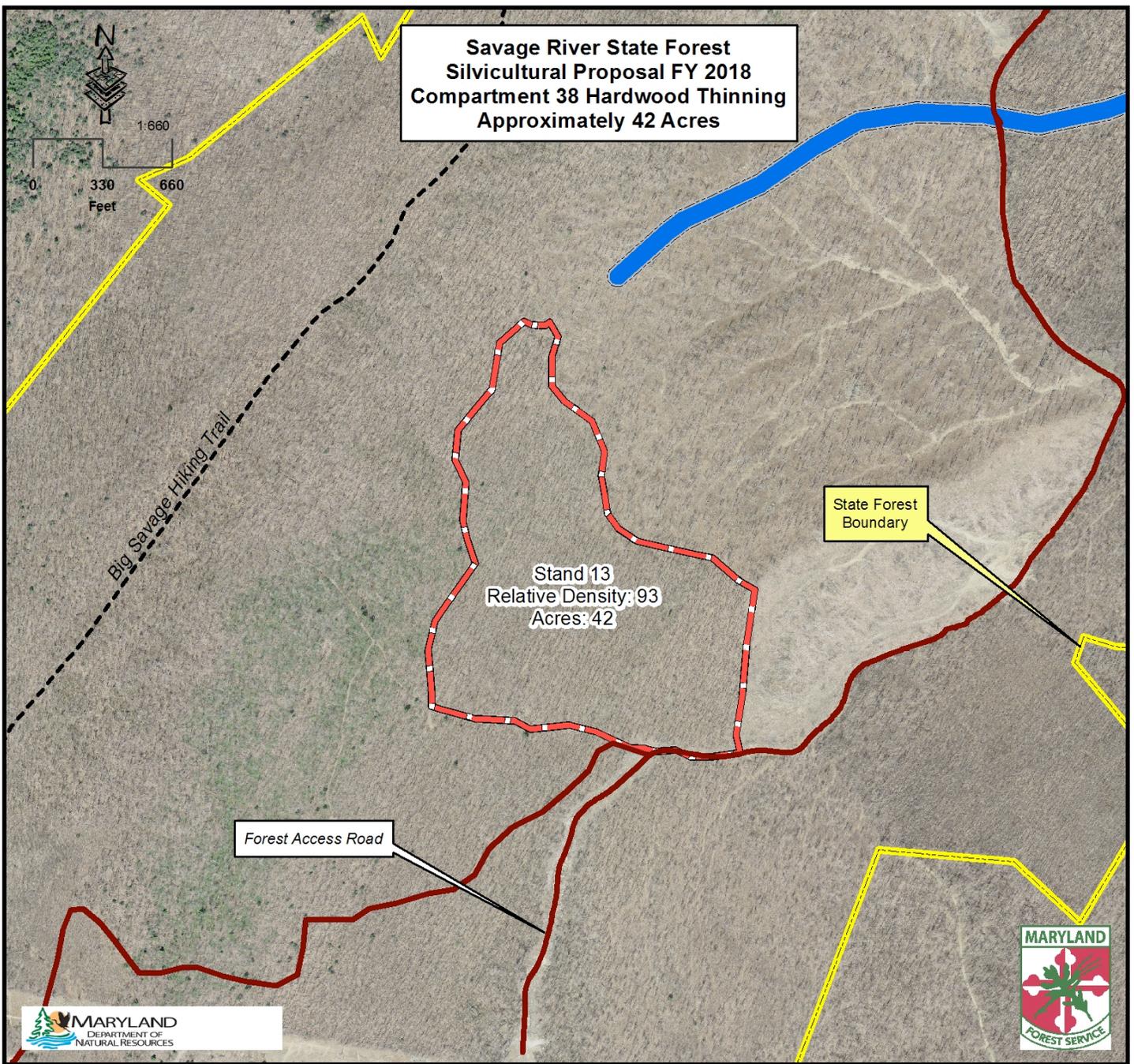
**Water Resources:** This stand drains north east into Winebrenner Run within the George's Creek watershed. All proposed silvicultural treatments will be outside of all HCVF and stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

**Soil Resources:** Three soil types contribute to the substrate of the management unit including Very stony land, rolling (VsD), Dekalb and Gilpin very stony loams (DgC), and Cookport and Ernest very stony silt loams (CuB). These soils are generally moderately deep and well drained. Degree of slope range from 0 - 15% throughout the site and these soils are potentially highly erodible. All three soil types have good productivity for woodland management, with site index values ranging from 65-75 for upland oaks. The productivity of the site will be protected by minimizing the haul roads and skid trails as per the Department's Best Management Practices and rutting guidelines.

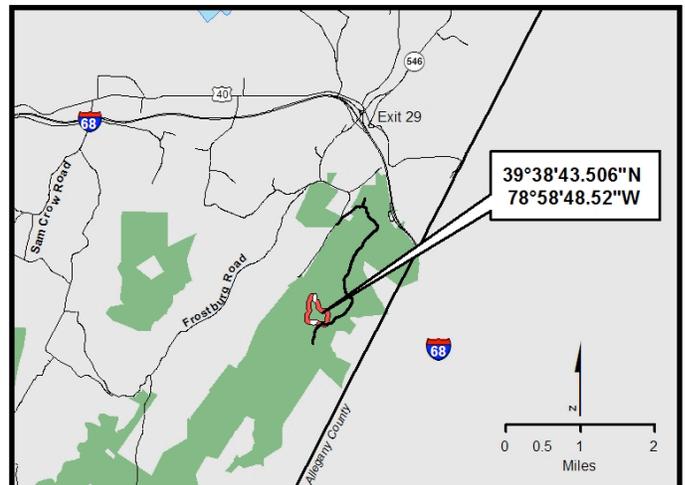
**Recreational Resources:** No developed recreational resources exist within the management unit. The Big Savage Hiking Trail is located approximately 1,100' west of the proposal and will not be impacted by any silvicultural activities. Hunting is the primary recreation conducted in the area and hunting opportunities may be limited or disrupted depending on when the harvest operation is conducted. The St. Johns Rock forest access road will be used as a haul road for the scheduled harvest. The road is primarily used for hunting access, but preliminary plans are being considered to convert the road into an ORV trail for part of the year. If these plans are implemented within the time frame of the proposed harvest, measures will be taken to ensure the safety of the recreationists as well as the timber harvest operators.

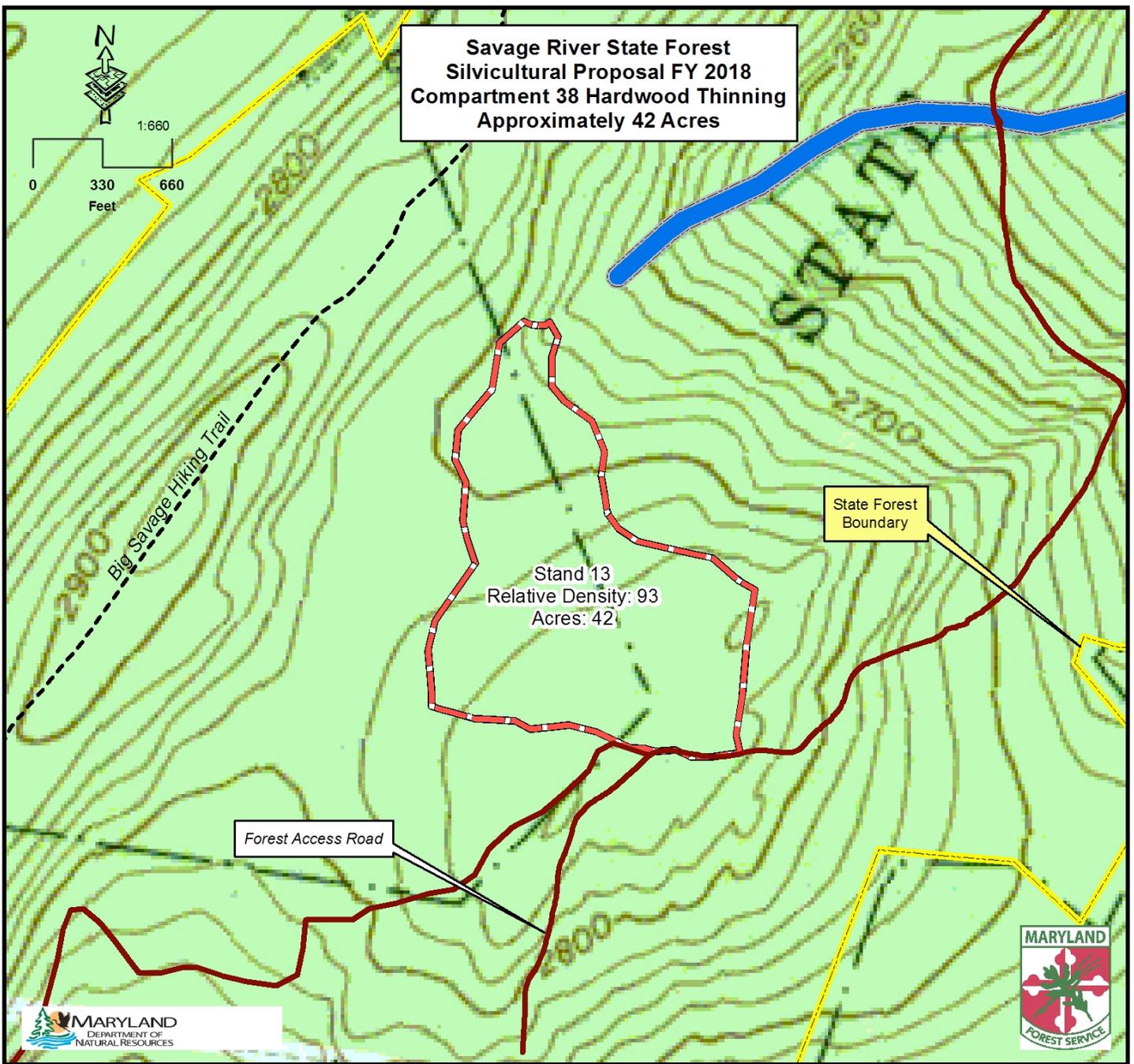
### **Management and Silvicultural Recommendations**

In an effort to maintain the current oak regeneration numbers and facilitate their growth into successive cohorts a two stage shelterwood system will be implemented in the management unit. In the first stage, a medium density establishment cut will be implemented removing one half of the basal area and retaining approximately 56 ft<sup>2</sup> per acre. Harvest yields will average 3,500 board feet/acre. Retention trees will be desirable dominant and co-dominant specimens of superior form that will be capable of surviving exposure, providing adequate shelter for developing regeneration and providing a seed source. Post harvest, regular inventories will be conducted within the stand to monitor regeneration in order determine the proper timing for a final removal harvest or determine if further cultural work is necessary for desirable regeneration to become established and provide a fully stocked stand before the final removal harvest is conducted.

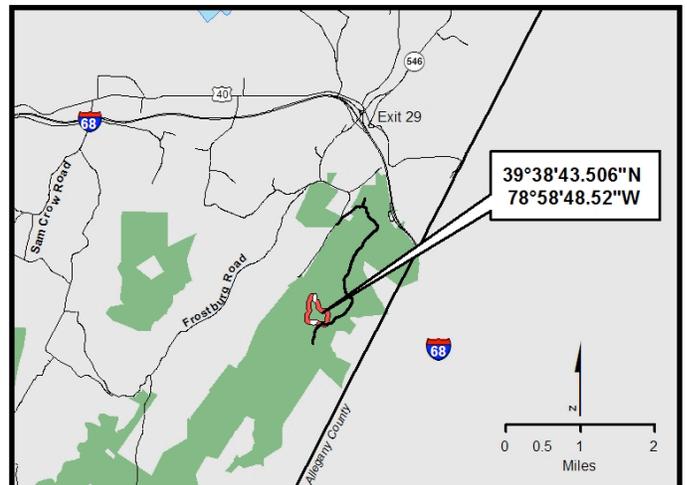


-  Wildlands
-  Ecologically Significant Area
-  Old Growth
-  Old Growth Ecosystem Area
-  Wetland of State Concern
-  Streams and 50' Buffers





-  Wildlands
-  Ecologically Significant Area
-  Old Growth
-  Old Growth Ecosystem Area
-  Wetland of State Concern
-  Streams and 50' Buffers



**Description/Resource Impact Assessment**

**Location:** This 55-acre management unit is situated adjacent to the access road of the St Johns Rock overlook located approximately .6 miles north of the intersection of the St Johns Rock county road and the forest access road in Compartment 38, Stands 19, 20, and 22 of the Savage River State Forest.

**Forest Community Type and Condition:** A small sawtimber transitional stand occupies this 52-acre site. The stand is approximately 72 years old with an average merchantable diameter of 12.4 inches. This stand has a relative density of 72% and averages 92 ft<sup>2</sup> of basal area/acre. The dominant overstory species include red maple (31%), northern red oak (24%), black birch (15%) and black cherry (7%). Acceptable growing stock accounts for only 37 ft<sup>2</sup> or 40% of the total average basal area of the stand. Competitive oak regeneration occupies approximately 23% of the site and oak regeneration in all cohorts occupies 26% of the harvest area.

**Interfering Elements:** Interfering understory plant competition occupies approximately 97% of the site. The majority of this vegetation (95%) is in the form of tall woody interference dominated by black birch and witch hazel. Low woody interference is less problematic occupying 30% of the site. One non-native invasive species (NNIS), garlic mustard, was found in the stand.

**Historic Conditions:** In 2007 the land on which the management unit is situated was acquired from the Borden Mining Company. Records of silvicultural activities are not available and no harvest activities have been implemented on the site since the state acquired the land.

**Rare, Threatened and Endangered Species:** At this time, the Forest Manager knows of no rare, threatened or endangered species on the site or any species that would be impacted by the silvicultural prescription.

**Habitats and Species of Management Concern:** Several large rock outcrops are centrally located in the management unit. These features will be buffered accordingly to protect the unique habitat niche that it provides.

**Water Resources:** Three streams in two watersheds receive runoff from this site. The northern end of the parcel drains into the upper reaches of the Savage River within the Savage River watershed. The northeast and southern portions of the management unit drain into two separate unnamed tributaries of Sand Spring Run within the George's Creek watershed. The proposed silvicultural treatment will be outside of all HCVF stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

**Soil Resources:** Underlying soils include Very stony land, rolling (VsD) and Very stony land, steep (VsF). Degree of slope ranges from 0-25% throughout the site. Equipment limitations are severe due to the extreme rockiness. Hazard of erosion is moderate to severe on steep slopes. The

site has low productivity for woodland management, with a site index values ranging from of 45-55 for upland oaks. The productivity of the site will be protected by minimizing the haul roads and skid trails as per the Department's Best Management Practices and rutting guidelines.

**Recreational Resources:** The St Johns Rock scenic overlook, a sandstone outcrop of the Pottsville formation, is located within the boundaries of the harvest proposal. Recreationists have been frequenting this popular geological feature since the late 19<sup>th</sup> Century for the scenic vista it affords of Frostburg, MD. The site is registered on the Maryland Historical Trust Inventory for State Historical Sites. To ensure that the integrity of the site remains intact, a buffer of appropriate width will be established around the site that will be excluded from the harvest.

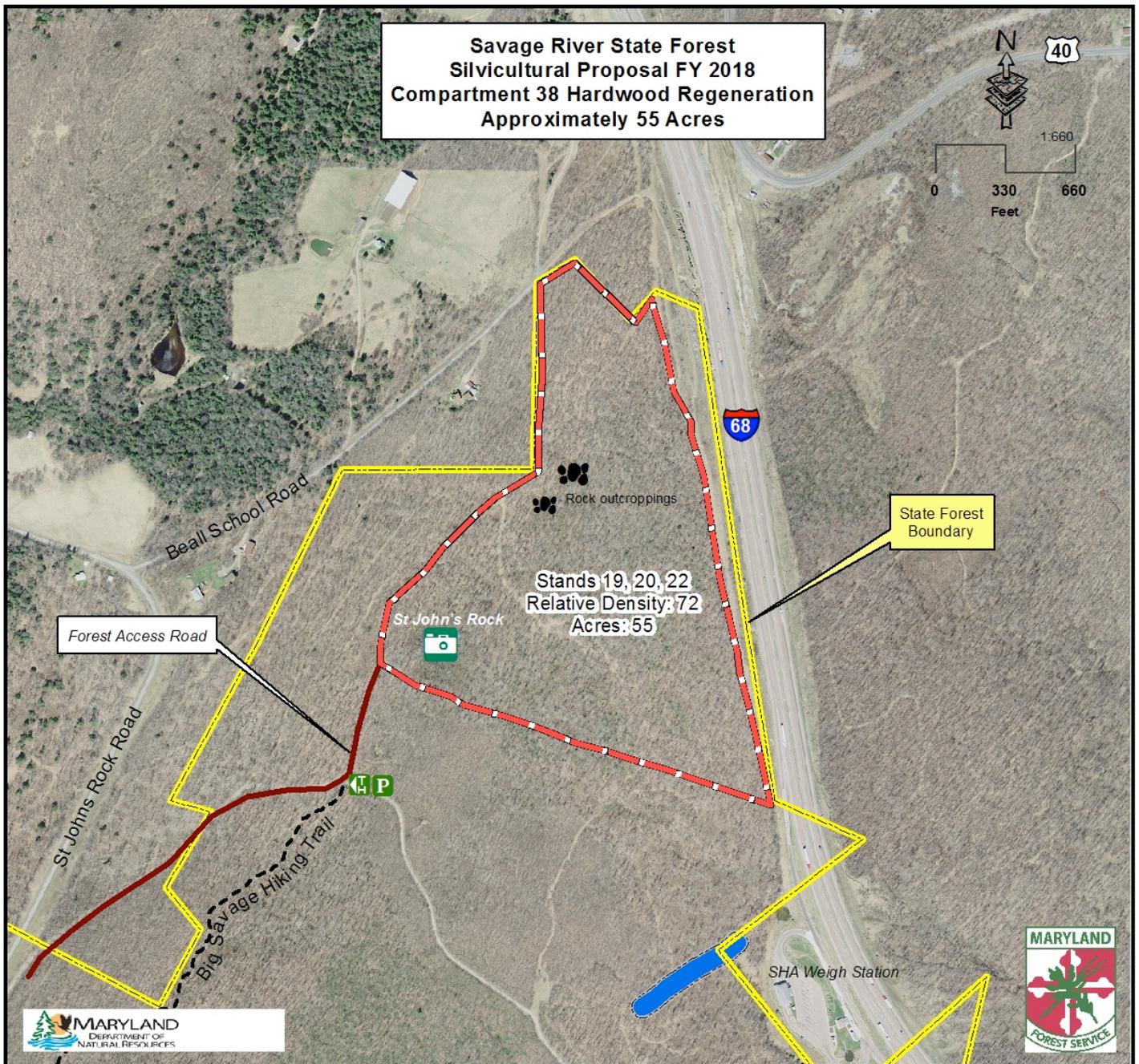
The road is primarily used for hunting access, but preliminary plans are being considered to convert the road into an ORV trail for part of the year. If these plans are implemented within the time frame of the proposed harvest, measures will be taken to ensure the safety of the recreationists as well as the timber harvest operators including temporary closure of the trail.

Additionally, the trail head for the Big Savage Hiking Trail is located off the forest access road that will be utilized as a haul road for the harvest activities. Cautionary signage will be placed in prominent locations along the travel route advising visitors of the potential danger presented by the harvest operations.

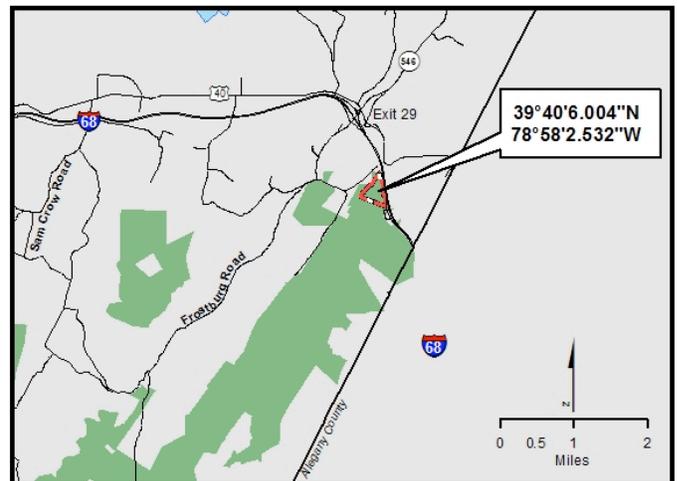
### **Management and Silvicultural Recommendations**

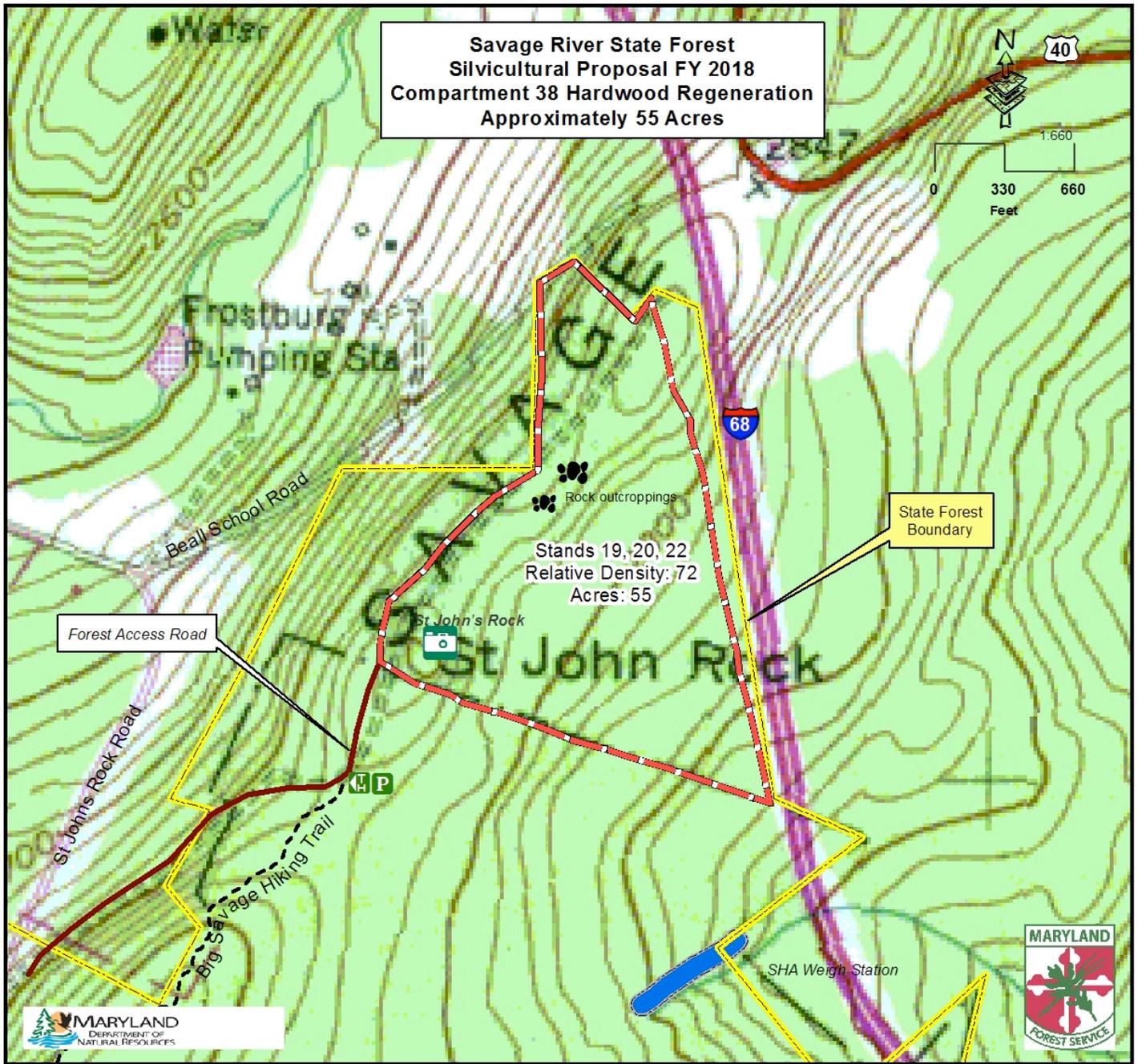
As a consequence of the preferential timber harvesting practices implemented by previous ownership, more than 60% of the current growing stock in this stand is deemed unacceptable. Further management of the stand in its present condition is not warranted. The existing stand will be regenerated allowing the competitive regeneration occupy the site. A clearcut with residuals will be implemented on the site to ensure that adequate sunlight is made available to the advanced regeneration. Retention criteria will focus on four to eight dominant and co-dominant trees per acre that provide a mast/seed source or wildlife value, i.e. den trees, snags, nesting sites.

Site monitoring will be conducted following the harvest in order to gauge the regeneration response and determine if additional silvicultural work is necessary to facilitate the establishment of a higher quality stand as compared to the original. Harvest contract terms will stipulate that high tops and slash remain on the site to deter deer browsing on stump sprouts and seedlings.

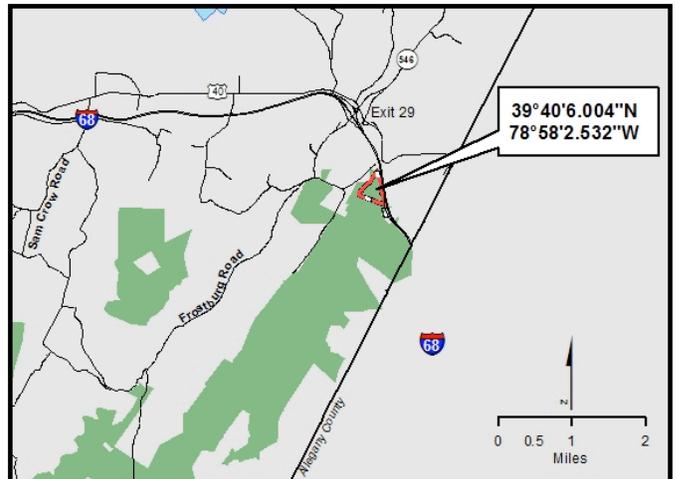


-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**





-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**



### Description/Resource Impact Assessment

**Location:** This 30-acre proposal is situated north of Glendale Road, accessible via an existing forest access road located approximately 1.8 miles west of the intersection of State Route 495 and Glendale Road in Compartment 77, Stands 2, 5 and 7 of the Savage River State Forest.

**Forest Community Type and Condition:** This medium sawtimber transitional stand is approximately 95 years old with an average merchantable diameter of 14.7 inches. Dominant overstory species include red maple (24%), American beech (22%), northern red oak (17%), white oak (12%) and white pine (6%). This stand is overstocked at 110% relative density and contains approximately 142 ft<sup>2</sup> of basal area per acre.

**Interfering Elements:** Interfering understory plant competition throughout the site is minimal. Tall woody interference occupies less than ten percent of the harvest area and low woody interference in the form of mountain laurel and blueberry is found on 43% of the management unit. Deer impact is considered moderate on the site and must be addressed when considering regeneration efforts on this site.

**Historic Conditions:** State Forest records show these stands were thinned in 1975 and 1983. No evidence of fire or significant insect infestation was observed during the inventory of the site.

**Rare, Threatened and Endangered Species:** At this time, the Forest Manager knows of no rare, threatened or endangered species on the site, or any species that would be impacted by the silvicultural prescription

**Habitats and Species of Management Concern:** The proposed harvest site includes a portion of the ecologically significant area referred to as “Warren’s Grove”. This area contains a stand of large American beech, an uncommon forest type within Savage River State Forest. Harvest operations are proposed within this area to facilitate the establishment of a mixed pine hardwood stand.

**Water Resources:** Drainage from the site is northward into Meadow Mountain Run within the Youghiogheny River watershed. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated wetlands per the requirements set forth in the State Forests Sustainable Forest Management Plan.

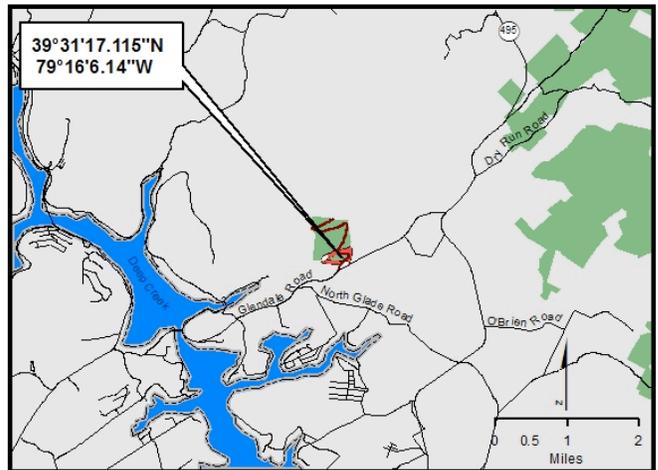
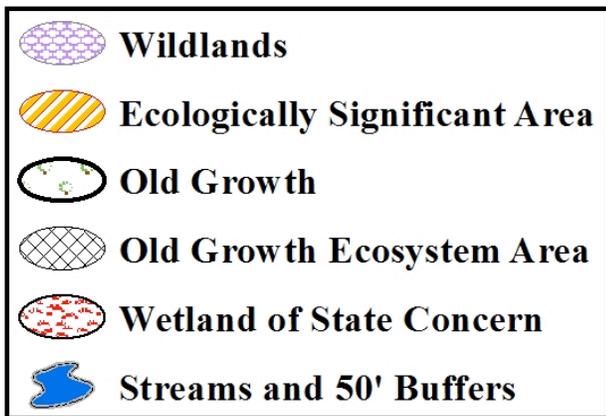
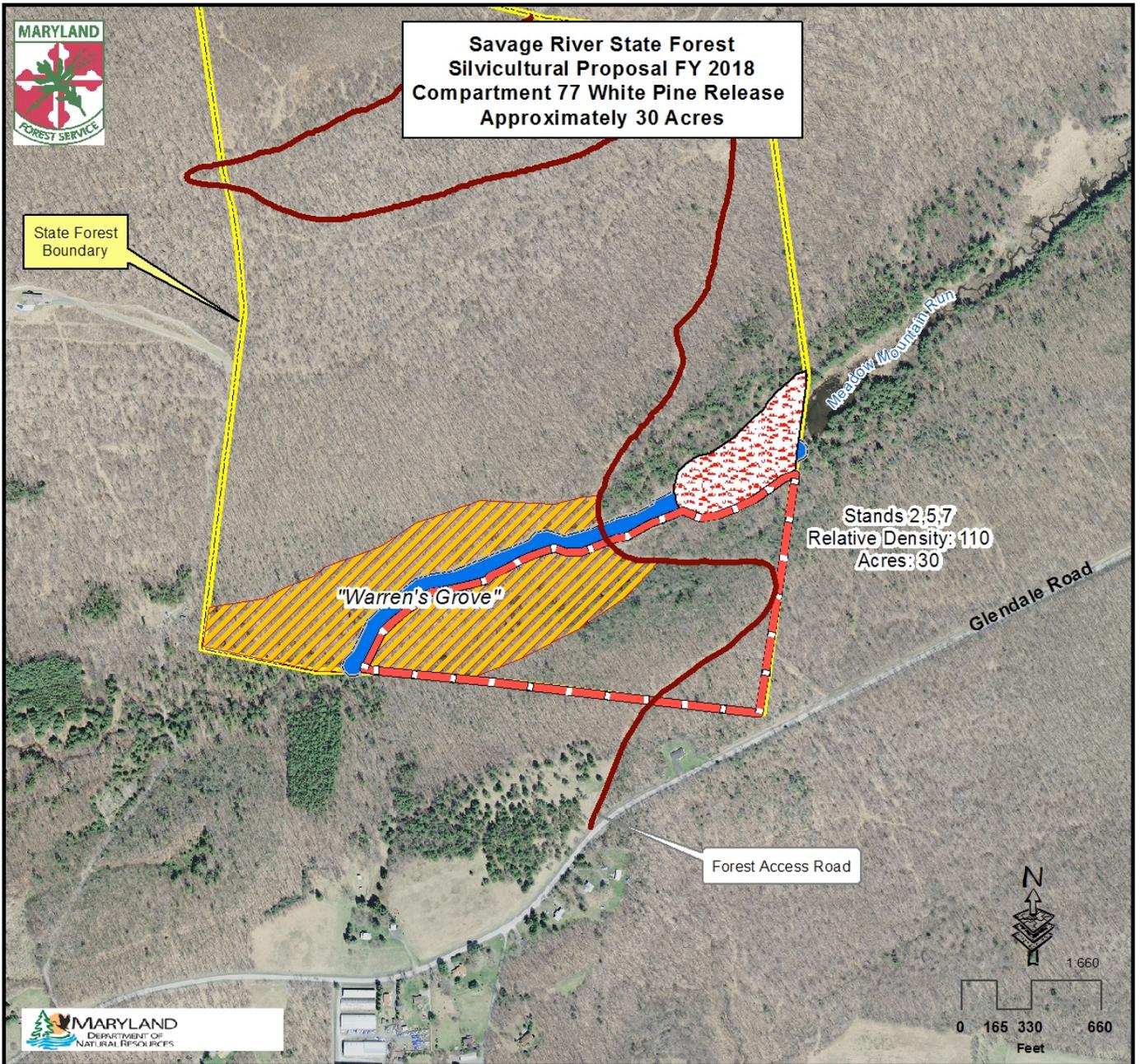
**Soil Resources:** These soils are generally moderately deep and well drained with inclusions of some poorly drained soils. Degree of slope ranges from 0-25% throughout the site. Equipment limits range from slight to moderate where slopes exceed 15%. Hazard of erosion is slight to moderate. The site has fair to excellent productivity for woodland management, with site indices ranging from of 55-85 for upland oaks. The productivity of the site will be protected by minimizing the haul roads and skid trails as per the Department’s Best Management Practices and rutting guidelines.

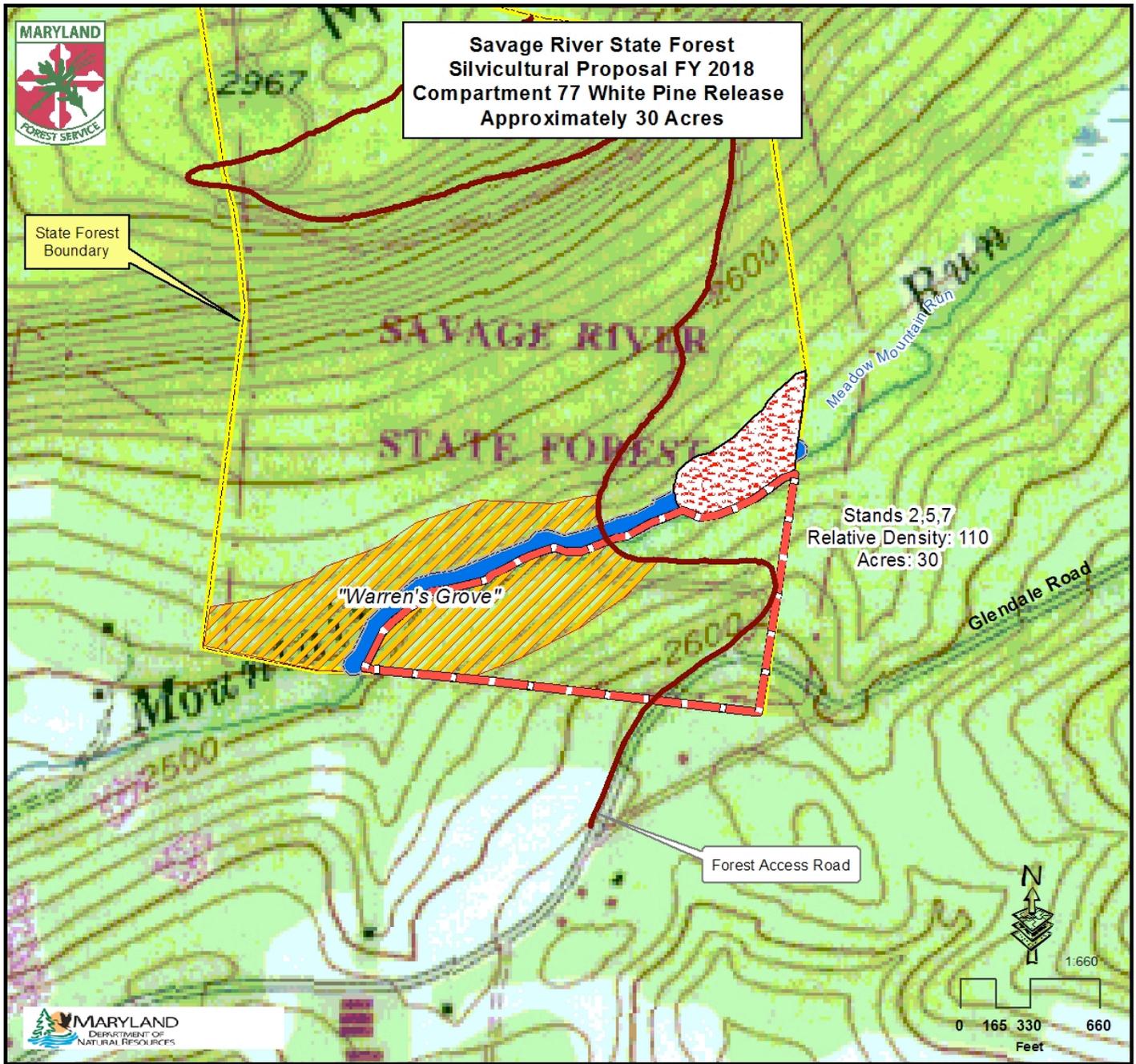
**Recreational Resources:** No developed recreational resources are found within the management unit. The main recreational activity performed within this area is hunting. Snowmobile traffic originating from Deep Creek State Park may occasionally occur on the harvest access road. Recreational opportunities may be disrupted for the duration of the harvest activities and access to the site may be limited depending on the timing of the harvest. Temporary closure of the trail may be necessary during the harvest in order to ensure visitor safety.

### **Management and Silvicultural Recommendations**

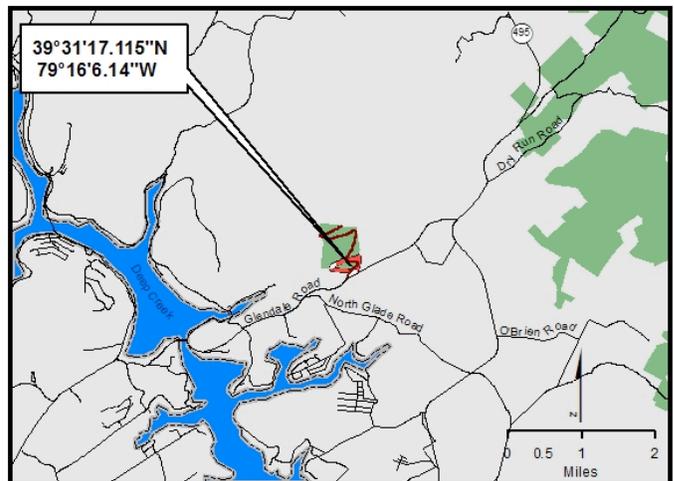
Given the species composition of the stand, this site affords the unique opportunity to facilitate the growth of a native white pine-hardwood stand. White pine is found throughout the site in all growth stages from seedlings to mature specimens with the majority found in the understory of the hardwood species. In the absence any management efforts, the site will eventually revert back to a hardwood dominated site. In an effort to maintain the mixed stand and increase the white pine component of the overstory, a white pine release harvest will be conducted. The harvest will involve a crown thinning to remove approximately 40% of the basal area per acre resulting in a residual basal area of 85 ft<sup>2</sup>/acre.

This conservative approach will provide adequate light for white pine growth while simultaneously providing enough shade to limit potential white pine weevil infestation. Approximately 3,600 board feet/acre will be harvested from the site. The site will be monitored regularly to determine the success of the thinning efforts on white pine growth and establishment and to determine if further silvicultural activities are necessary to maintain the white pine component of the stand.





-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**



## **XI. Operational Management and Budget Summary**

- A. Introduction**
- B. Funding Sources**
- C. Operational Cost**

### **Submitted Budget Request**

The submitted annual budget for Savage River State Forest totals \$608,307. Of that amount, \$348,725 goes to fund classified salaries and benefits for four employees; \$83,193 funds four contractual employees and \$75,000 is appropriated to Garrett County in lieu of property tax payments, leaving \$110,642 for forest operations. Savage River has generated revenue that greatly exceeded its cost of operation for many years. The majority of revenue is obtained from the sale of forest products. Successful marketing in selling a mix of species and grades of wood products that the market most demands has contributed to substantial revenue generation over the years.

### **Operational Management**

#### **A. Introduction**

This section of the plan is designed to cover the annual cost and revenues associated with the operational management of Savage River State Forest (SRSF). It is the Department's intent that all revenues generated from SRSF will be used to pay for the management and operation of the Forest. The numbers expressed in this section are only estimates and averages of annual expenses and revenues. These numbers will fluctuate each year based on management prescriptions, economic conditions and public use of the forest.

The following information is a breakdown of Revenues and Operational costs associated with SRSF. These figures are only estimates that are based on projected revenues and operational expenses. Yearly changes in timber markets and weather conditions can severely affect revenues. Operational expenses will vary from year to year and the numbers below are based on the budget request submitted for FY-2018.

#### **B. SRSF Funding Sources: Estimated - \$647,560**

State Forests in Maryland are funded from several sources. The first source is the revenue generated by the forests. These funds are deposited in the Department of Natural Resources Forest or Park Reserve Fund and must be appropriated by the General Assembly through the annual budgeting process before being spent. The state forest budget is prepared approximately one year before the beginning of the fiscal year in which it will be spent. The budget then goes through the legislative approval/review process along with all other state operating budgets. Once adopted, the budget goes into effect the first day of the fiscal year (July 1<sup>st</sup>). Revenue generated by the state forest is designated special fund revenue. There may be special funds provided from the Department of Natural Resources Forest or Park Reserve Fund

that are not generated by this particular forest or there may be a lesser amount of special funds shown in the budget than was generated on this specific forest.

The second source is included in the Maryland Forest Service Off Road Vehicle (ORV) Budget. This separate budget is based on revenue generated from ORV permit sales statewide and is allocated back to the state forests through the budgeting process. ORV funds generated as permit sales at SRSF do not necessarily reflect funds allocated back to the SRSF operating budget. These funds must be appropriated before being spent. ORV funds are a restricted special fund and can only be spent for ORV Trail related expenditures. In FY-13, Savage River State Forest received \$12,000 from this fund source, which was the last year that the state forest received such funds. As a result of necessary closures of significant trails on both Savage River and Green Ridge State Forests, ORV based revenue has declined substantially. The limited funds available have been directed toward developing replacement trail systems on the State Forests.

Another source of funding for the state forest is Recreational Trail Grants. These grants are competitive and are generally limited to \$30,000 per year per grant. The source of this funding is the Federal Department of Transportation administered through the Maryland Department of Transportation, State Highway Administration. These funds are designated as reimbursable funds. Savage River State Forest has requested Recreational Trail Grant funds in the amount of 30,000.00 for personnel to maintain the newly developed 7 mile St. John Rock ORV Trail.

C. Operational Cost: Estimated Annual Expenses - \$617,560

Operational expenses are those costs paid directly out of the SRSF operational budget by the State Forest Manager. The Forest Manager prepares a proposed operational budget for the forest based on instructions provided approximately one year in advance of the fiscal year. The FY-2018 budget proposal was prepared in August of 2016.

▪ *Classified Salaries, Wages and Benefits: \$348,725*

This cost is associated with Special Funds which are state tax revenues provided annually. These funds are used to pay the salaries of the Maryland classified employees responsible for the management, operation and maintenance of the State Forest.

▪ *Contractual Staffing: \$83,193*

This cost is associated with contractual staffing associated with operations of the state forest. Contractual personnel are responsible for conducting work outlined in the annual work plan, managing the daily activities on the forest, including boundary line work, maintenance of trails, forest roads, maintaining primitive campsites, a public shooting range, overlooks, wildlife habitat areas, and implementing all maintenance, recreational, silviculture, and ecosystem restoration projects.

▪ *Land Operation Costs: \$110,642*

This includes expenses for office and field equipment, vehicles, gates, gravel, signs, boundary paint, roadwork contracts and construction, trash removal from illegal dumping, boundary line work & surveying, tree planting, site preparation, control of invasive species, non-commercial

thinning and other forest management practices. These costs vary greatly from year to year based on the activities identified in the Annual Work Plan.

- *County Payments: \$75,000*

These are revenue payments to local county governments which will vary every year. Payments are made on an annual basis to Garrett County based on 25% of the gross revenue generated from Savage River State Forest. These payments come out of revenue generated from timber sales and recreation. These payments are used to help the counties offset the loss in property tax revenues which are not paid on state owned lands.

The FY-18 Work Plan calls for the harvest of approximately 1,200,000 board feet of hardwood and softwood saw timber, putting an estimated \$250,000 worth of raw wood products out into the local markets. With the repeated gypsy moth infestations and weather related damages to oak stands in the past decade, much of the silvicultural work laid out in this work plan is focused on initiating seedling development to better insure oak regeneration successes in future harvests. Much of the value of the harvests in the work plan will be directed back into the forest providing the essential investment in pre-harvest cultural work that will assure the long term sustainable management of these important forest resources.

#### 4. Summary

This is the general breakdown on Revenues and Operational Costs associated with the Savage River State Forest. As described, these figures will vary from year to year. A more detailed picture on revenues and operational cost will be reviewed quarterly as the actual picture develops within implementation of Annual Work Plan and as operating budgets are approved.

## XII. Appendices

### **Appendix 1: Yellow Archangel Management Plan**

#### ***Savage River State Forest Non-Native Invasive Plant Management***

##### **Yellow Archangel (*Lamium galeobdolon*)**

##### **Compartments 54 and 55; Dry Run Road**

###### **Description:**

Dry Run, a tributary of the Savage River and Savage River Reservoir has been infested with the aggressively growing, non-native invasive perennial yellow archangel (*Lamium galeobdolon*). The infestation of the area most likely originated from a private residence which was abandoned and the once maintained yard area was neglected, allowing the plant to escape to the adjacent property. After establishing a colony at the head of the watershed, the plant quickly enveloped the drainage from the private residence to the high water mark of the Savage River Reservoir, encompassing nearly 15 acres of forest land (See project map).

The plant grows quickly and out-competes native vegetation for resources. Yellow archangel spreads in several ways; by seed, by stem fragments, and by rooting at the nodes of the stem. This makes the plant very difficult to control and requires multiple applications of herbicide and diligent monitoring to limit the spread of the plant in natural forest environments. There is no projected end date for the herbicide treatments due to the persistent nature of this plant and efforts will be made annually until the spread of the plant is contained or the plant is eradicated. We anticipate successful eradication of this plant given the relatively confined area of infestation. Site monitoring will continue after the eradication of the plant for at least 5 years.

###### **Treatment:**

The initial treatment occurred on Thursday April 5, 2012. Ideal application time for this species occurs in March when the plant is beginning to grow and native plants are dormant. Weather conditions, particularly snow, have precluded the application of treatment for the past two years. Approximately one acre of the drainage was treated from the bridge at the intersection of Savage River Road and Dry Run Road north for nearly 600'. The width of the stream channel occupied by the yellow archangel averaged around 75'. Initial herbicide treatment was done with a 53.8% glyphosate product with the trade name Rodeo, (EPA Reg. No. 62719-324) labeled for aquatic use, and was applied using back pack sprayers at an application rate of 3.0 ounces per gallon resulting in a 2% solution. A total of 24 oz of undiluted product (8 gallons solution) was applied to the treatment area. Weather conditions at the time of application were sunny with temperature in the mid-50s and estimated wind speed of 3 mph and clear conditions were predicted for the next 24-hour period.

The second treatment occurred on Thursday May 8, 2014 and included reapplication to the original treatment area in order to treat individuals that may have been missed or re-sprouted due to insufficient product reaching the foliage. After the second treatment, nearly 2.7 acres of the drainage have been treated. Native plant emergence has halted further application of herbicide for the year. A 53.8% glyphosate product with the trade name Aqua Master, (EPA Reg.

No. 524-343) labeled for aquatic use, was applied using backpack sprayers at an application rate of 2.5 ounces per gallon of water resulting in a 2% solution. A total of 40oz of undiluted product (16 gallons solution) was applied to the treatment area. Weather conditions at the time of application were sunny with temperatures in the 60s and average wind speeds of 3 mph. Clear conditions were predicted for the following 24-hour period.

Product application is conducted by registered employees working under the license of a certified applicator (Permit No. 8943-8714; Categories 2-6-10). The next scheduled treatment should occur in late March to early April of 2018.

<b>Treatment Schedule</b>	
<b>Monitoring</b>	<b>Chemical</b>
April – September (Annually)	Early March to April (Annually)

conducted on the interfering understory in order to further open the forest floor to diffuse sunlight and encourage desirable regeneration. The fern layer of the stand had been treated by forest personnel three years ago in a first step toward regeneration establishment.

Compartment 36: The proximity of the site to the Savage Ravines Wildlands was noted. The proposed harvest will in no way impact the wildland. Public safety concerns revolving around trees that lean over the county road were discussed. These trees will be removed as part of the harvest. Rock outcrops present in the stand will be buffered to preserve the habitat niche.

Compartment 37: No specific comments were made regarding the silvicultural prescription for the site, but a suggestion was made to utilize the access to the harvest as a means to clear the section of the Big Savage Hiking Trail that crosses the compartment. Given that recent weather events and gypsy moth infestations have caused widespread mortality in the area and many of the trees have fallen across the trail making traversing it a challenge, the timber operator could remove the larger obstacles as part of the harvest contract.

Compartment 38 Thinning: The proximity of the harvest to the St Johns Rock/Red Dog Road OHV Trail was noted. Forest service personnel reminded the group that even with the addition of the trail, the area still remains a working forest and will not interfere with the silvicultural work being done throughout the management area.

Compartment 38 Regeneration Harvest: Concerns for the site as known Allegheny wood rat (*Neotoma magister*) habitat were raised. Such sites would require implementing a 200 meter (31 acre) no cut buffer around the rock outcrop, eliminating more than half of the proposal. A request was made for specific records verifying the area as known wood rat habitat. Forest Service personnel noted that no concerns regarding wood rat habitat and/or findings were mentioned during the Interdisciplinary Team review of the site that was attended by Wildlife and Heritage staff whose expertise centers on rare, threatened and endangered species like the Allegheny Wood Rat. It was noted that the distance between known wood rat habitat and the site was of great enough distance that did not warrant any extra buffers to be implemented.

Also, with the proximity of Braddock's Road to the site and the soon to be constructed OHV trail, the suggestion was made to use the increased visitation to the area as a chance to inform and educate the public about the historical significance of the landmark.

Compartment 77: Questions arose concerning the proximity of the ESA "Warren's Grove" to the harvest site. It was explained that the objective of the proposed harvest is to enhance the management area by promoting the growth of native white pine that is found throughout the stand in an effort to create a mixed conifer hardwood stand. This harvest also serves to meet an "Opportunity for Improvement" issued by the Certification Auditors to increase the amount of conifer and mixed conifer stand on the forest landscape.

Members of Garrett Trails suggested that a cooperative effort with Savage River State Forest personnel be undertaken to secure Recreational Trail Grants in order to increase the amount of trail maintenance that is completed each year on the forest.

## **Appendix 2: Japanese Knotweed Management Plan**

### **Savage River State Forest Invasive Plant Management** **Japanese Knotweed**

#### **Description:**

Several areas of Savage River State Forest have become infested with the invasive plant Japanese knotweed (*Polygonum cuspidatum*). Seven treatment areas have been delineated (see attached project maps) and four of them will be treated and monitored to determine the most effective course of action for suppressing and ultimately eradicating the plant from these areas of the forest. Knotweed growth in Area V has reached a critical level and will not be treated at this time due to the overwhelming investment that would be required to reach any reasonable level of control. As more effective treatment methods become available for large areas, this area will be reevaluated in regard to implementing a control plan.

Japanese knotweed is a fast-growing, herbaceous, rhizomatous perennial that forms dense patches and shades out all nearby native species. The plant originated in East Asia and was imported as an ornamental in the late 1800's. Also called Mexican bamboo, fleece flower, hu zhang, the plant can grow to heights of greater than 10 feet and can inhabit almost any terrestrial environment whether shaded or in full sunlight. It is difficult to control due to the massive number of seeds that are produced and the rhizomatous adaptation of the plant. Multiple applications of mechanical and chemical control as well as diligent monitoring will be necessary to control the spread of the plant in natural forest environments. There is no projected end date for the herbicide treatments due to the persistent nature of this plant and efforts will be made annually until the spread of the plant is contained or eradicated from the four designated areas.

#### **Treatment:**

The initial treatments occurred in the first week of June, 2011 at campsite 171 on Rabbit Hollow Road and on Fairview Road approximately one mile from the intersection with New Germany Road. Both locations have small populations of knotweed. Treatments in all areas of the forest involve a two step process that includes both mechanical and chemical means of control.

First, the knotweed is cut and allowed to grow back for 8 weeks, reaching only 2 to 4 feet in height. Second, the new growth is treated with a 2% solution of glyphosate as the active ingredient. Initial treatment was done with a 41% glyphosate product with the trade name Gly-4 (EPA Reg. No. 524-454-72693) and was applied using backpack sprayers at an application rate of 3.0 ounces per gallon resulting in a 3% solution. Approximately 4 gallons of solution was applied total between the two sites. Treatment of these two areas has been repeated on a yearly basis and two other areas have been added to the treatment regime.

The two areas added to the management plan include three patches adjacent to Route 495, just north of the intersection with New Germany Road and two patches located on Westernport and Aaron's Run Road, just south of the High Rock Tower. In 2013, a solution of 53.8% glyphosate with the trade name Rodeo (EPA Reg. No. 62719-326) and was applied with backpack sprayers at a rate of 2.6 ounces per gallon resulting in a 2% solution. A total of 19.5 ounces of undiluted product (50.7 gallons solution) was applied to the treatment areas.

Product application is/was conducted by registered employees working under the license of a certified applicator permit (Permit No. 8943-8714; Categories 2 and 6). The next scheduled mechanical treatment will occur June 1, 2017 followed by the herbicide treatment on July 27, 2018.

<b>Treatment Schedule</b>		
<b>Monitoring</b>	<b>Mechanical</b>	<b>Chemical</b>
March – June 2017	June 2, 2018	July 26, 2017
March – June 2018	June 1, 2019	July 27, 2018
March – June 2019	June 1, 2020*	July 27, 2019*
March – June 2020	June 1, 2021*	July 27, 2020*
March – June 2021	June 1, 2022*	July 27, 2021*
March – June 2022	As needed	As needed

\* Treatment schedules may be altered/eliminated depending on the efficacy of the previous treatment applications.

**Appendix 3: 10 Year Timber Harvest Summary Table**

<i>Fiscal Year</i>	<i>Planned Harvest</i>	<i>Bd. Ft. Vol. Harvested</i>	<i>Gross value</i>
<b>2008</b>	<b>1.5 MMBF</b>	<b>1,032,193</b>	<b>\$545,710.00</b>
<b>2009</b>	<b>1.5 MMBF</b>	<b>1,714,735</b>	<b>\$411,485.00</b>
<b>2010</b>	<b>1.2 MMBF</b>	<b>1,244,076</b>	<b>\$241,781.00</b>
<b>2011</b>	<b>750 MBF</b>	<b>850,561</b>	<b>\$176,000.00</b>
<b>2012</b>	<b>382 MBF</b>	<b>144,349</b>	<b>\$26,834.50</b>
<b>2013</b>	<b>488 MBF</b>	<b>863,049</b>	<b>\$161,910.00</b>
<b>2014</b>	<b>1.02 MMBF</b>	<b>521,526</b>	<b>\$72,689.77</b>
<b>2015</b>	<b>1.02 MMBF</b>	<b>1,286,994</b>	<b>\$275,126.44</b>
<b>2016</b>	<b>1.0 MMBF</b>	<b>941,285</b>	<b>\$225,796.59</b>
<b>2017</b>	<b>1.2 MMBF</b>		

## Appendix 4: 2016 FSC Audit Action Plan

### Forest Stewardship Council 2016 Audit: Overview of Audit Findings

#### **Finding Number: 2015.1**

#### **FSC-US indicator 5.6.c. – Closed**

#### **Non-Conformity (or Background/ Justification in the case of Observations):**

Rates and methods of timber harvest are not leading to achieving desired conditions, or improving or maintaining health and quality across the FMU. Overstocked stands and stands that have been depleted or rendered to be below productive potential due to natural events, past management, or lack of management, are not being returned to desired stocking levels and composition at the earliest practicable time as justified in management objectives.

#### **SCS review**

In addition to the report shown for Savage River SF, FME demonstrated quarterly silvicultural reports for other state forests of the western region (e.g., Green Ridge SF). During discussions with FME staff, the issue of keeping up with harvests involves several variables, including mechanisms for tracking progress, issues related to operability and accessibility to stands scheduled for entry, recent salvage harvests, and, in some cases, timber markets. FME determined that tracking timber harvest scheduling progress would be a possible solution to monitoring these and other variables. FME also determined that a root cause was a lack of removing inoperable areas from the current productive acreage, which was continually resulting in the failure to meet area control objectives (i.e., annual allowable harvest). Reclassification has helped to reduce the amount of overstocked, inoperable stands within the harvestable area. Including reserves and protected areas, this now puts approximately two thirds of the state forest area in the western region out of production. However, FME may be able to put some of these inoperable areas back into productive if different harvesting methods or equipment become available in the region over time.

#### **Finding Number: 2015.2**

#### **FSC-US Indicator 6.2.b. – Closed**

#### **Non-Conformity (or Background/ Justification in the case of Observations):**

When RTE species are present or assumed to be present, modifications in management are made in order to maintain, restore or enhance the extent, quality and viability of the species and their habitats. Conservation zones and/or protected areas are established for RTE species, including those S3 species that are considered rare, where they are necessary to maintain or improve the short and long-term viability of the species. Conservation measures are based on relevant science, guidelines and/or consultation with relevant, independent experts as necessary to achieve the conservation goal of the Indicator.

On the Eastern Shore, there are several Delmarva Bay restoration projects that will require consistent prescribed fire applications for the first three years after initial restoration activities followed by periodic natural or prescribed fire at certain intervals. FME currently has been hindered by weather and lack of human resources to keep up with these activities. Specialists involved in this project have determined that restoration objectives for this community of RTE

plants cannot be met without fire. There is a similar situation with prescribed fire at Shale Barrens in the Western Region.

**SCS review**

FME has conducted nine burns since the last audit on the Maryland Shore and has developed a system to prioritize areas for each burn season. For the 2016 season so far, approximately 40% of the areas scheduled for prescribed burns have been completed. In the western region, the shale barrens have not received any prescribed burns, but have received other treatments such as chemical control of invading trees. Forestry staff members are still in discussion with Heritage staff about using timber harvests located near priority areas to prepare sites for prescribed burns. However, see OBS 2016.4.

**Finding Number: 2015.3**

**FSC-US Indicator 6.5.d. – Closed**

**Non-Conformity (or Background/ Justification in the case of Observations):**

The transportation system, including design and placement of permanent and temporary haul roads, skid trails, recreational trails, water crossings and landings, is designed, constructed, maintained, and/or reconstructed to reduce short and long-term environmental impacts, habitat fragmentation, soil and water disturbance and cumulative adverse effects, while allowing for customary uses and use rights. This includes:

- access to all roads and trails (temporary and permanent), including recreational trails, and off-road travel, is controlled, as possible, to minimize ecological impacts;
- road density is minimized;
- erosion is minimized;
- sediment discharge to streams is minimized;
- there is free upstream and downstream passage for aquatic organisms;
- impacts of transportation systems on wildlife habitat and migration corridors are minimized;
- area converted to roads, landings and skid trails is minimized;
- habitat fragmentation is minimized; and
- unneeded roads are closed and rehabilitated.

FME has fallen behind in its road construction and maintenance upgrades or closures due to several factors outside of its control in the Western Region. There are several crossings and other drainage features in need of upgrades (or closures) in order to prevent negative impacts to soil and water.

**SCS review**

A summary of completed and future projects was provided in the document provided by the FME. Through interviews with FME staff and field observation, SCS confirmed that significant progress has been made in prioritizing maintenance and in streamlining the review process to better control costs on road projects.

**Finding Number: 2015.4**

**FSC-US Indicator 6.6.c.**

**Non-Conformity (or Background/ Justification in the case of Observations):**

Chemicals and application methods are selected to minimize risk to non-target species and sites. When considering the choice between aerial and ground application, the forest owner or manager

evaluates the comparative risk to non-target species and sites, the comparative risk of worker exposure, and the overall amount and type of chemicals required.

Aerial spraying is done with a helicopter equipped with sensitive GPS equipment, which coupled with the machine's high maneuverability, helps to reduce the risk to non-target species and sites and virtually eliminates the risk of the pilot's exposure to chemicals.

On Wango Pines, during an aerial herbicide treatment the helicopter operator sprayed non-target species of concern (horse sugar and sheep laurel) that were clearly designated on maps and in GIS with buffers. The buffer was discussed with the forester in charge prior to the application, but apparently the pilot forgot about this sensitive site (note that others sensitive areas were avoided).

FME's contractor, Parker Forestry, has suggested some corrective actions to implement during the next application to eliminate this risk in the future (i.e., an onsite briefing just prior to spraying). Initial communication with the applicator on these corrective actions took place well prior to the FSC audit.

#### **SCS review**

Post-herbicide treatment maps were shown for recent aerial sprays. In all cases, protected individual trees and protected areas were not sprayed according to GPS data provided by the operator. FME also provided copies of hazard maps that its forestry contractor on the Maryland Shore reviews with aerial herbicide applicators prior to treatment, as well as records of these pre-application meetings.

#### **Finding Number: 2015.5**

##### **FSC-US Indicator 7.2.a.**

##### **Non-Conformity (or Background/ Justification in the case of Observations):**

The management plan is kept up to date. It is reviewed on an ongoing basis and is updated whenever necessary to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.

FME has made some changes to its management plans in response to OBS 2014.10 that have been incorporated into some SFMPs, but not all.

#### **SCS review**

SCS verified that the content as cited by FME is included in all State Forests' FMPs.

#### **Finding Number: 2016.1**

##### **FSC-US Indicator 6.3.a.1, 6.3.d and 6.3.e**

##### **Non-Conformity (or Background/ Justification in the case of Observations):**

According to the FMP and interviews with FME staff, native conifer species were likely more prevalent on the landscape than they are currently. FME is considering expanding the use of native and non-native conifers on certain sites as a wildlife management component, to restore native species (both conifer and broadleaf), and possibly to adapt to climate change and invasive pests/ pathogens.

There was one site where native conifer restoration with white pine was written into the site plan as an option, but FME staff were debating on whether or not to continue with that management

trajectory given deer browse pressure. Certain activities observed, specifically retention of hemlock, white pine, pitch pine and Virginia pine, within thinning and regeneration harvest units likely contribute to maintaining and/or increasing native conifer cover. However, at the landscape level, FME has not assessed the desired future condition of the native and non-native conifer component, including selection of species that will meet social, economic, and ecological objectives depending on site conditions.

**Finding Number: 2016.2**

**FSC-US Indicator 6.5.d and 6.5.g.**

**Non-Conformity (or Background/ Justification in the case of Observations):**

Trail funding and/or restrictions on its use may not allow for the timely maintenance and closure needs of existing authorized and unauthorized trails. The audit team observed instances where trail maintenance for existing trails did not occur due to lack of funds or difficulty in obtaining them. There is also some concern from stakeholders on the density of trails, particularly its effect on hunting success. Furthermore, the density of unauthorized trails may result in a loss of productive and protected forest area. Fewer restrictions on use of trail funds may result on greater opportunities for forestry, heritage and recreational staff to collaborate on the protection of sensitive resources at reduced cost while offering user groups a positive recreational experience.

**Finding Number: 2016.3**

**FSC-US Indicator 6.9.a**

**Non-Conformity (or Background/ Justification in the case of Observations):**

During interviews with FME staff, there was discussion on possibly expanding the use of Norway spruce and Red pine to mitigate the loss of native conifers, and to continue to serve as habitat for RTE species. Any expanded use beyond the currently planted area would have to be justified and based on scientific data.

Siberian crabapple is no longer produced in the state nursery, but has been used in the past on early successional habitat projects. State seed mixes for use on log landings and other sensitive areas include non-native clovers and grasses. Current recommendations from heritage staff are to avoid use of Siberian crabapple and the seed mix.

**Finding Number: 2016.4**

**FSC-US Indicator 7.1.b, 7.1.c and 7.1.e.**

**Non-Conformity (or Background/ Justification in the case of Observations):**

The management plan describes the history of land use and past management, current forest types and associated development, size class and/or successional stages, and natural disturbance regimes that affect the FMU (see Indicator 6.1.a). However, the historical presence of conifers in the management plan could be expanded to include the knowledge presented by local forestry staff during the audit, which could help set the stage for conifer objectives on the landscape.

ESA plans may not be being completed on time according to draft annual work plans reviewed. According to these drafts, ESA plans for FY2017 were to be completed over the winter of 2016. A failure to complete these plans may result in limited opportunities to avoid negative impacts to these areas, especially where active management may benefit the species or communities found in them. ESA management plans set the stage for the implementation of maintenance and

recovery objectives for RTE species and/or sensitive ecosystems, as well as detail monitoring strategies that are compatible with these objectives.

## **Appendix 5: 2016 SFI Audit Action Plan**

### **Sustainable Forestry Initiative 2016 Audit: Overview of Audit Findings**

Maryland's SFI Program demonstrated conformance against the SFI 2015-2019 Standard. There were no non-conformances, and three "Opportunities for Improvement". The program has continued to exceed the standard in several areas. As such, the program has earned continuing certification.

#### **2015 Non-Conformances Resolved**

Two non-conformances which were identified in the 2015 audit have been resolved.

Indicator 2.3.6 requires "Road construction and skidding layout to *minimize* impacts to soil *productivity*. The program has demonstrated the ability to identify and prioritize the most critical road segments for temporary repair and for major reconstruction. Reconstruction projects reviewed were completed to high standards and should be expected to sustain use at expected levels. (2015 Minor Non-conformance: Administrative challenges continue to delay the implementation of necessary road repairs and upgrades.)

Indicator 2.4.2 requires "Management to promote healthy and productive forest conditions to *minimize* susceptibility to damaging agents." Field observations allowed the audit team to conclude that the increased pace of forest management practices are developing and maintaining healthy forests in most areas. (2015 Minor Non-conformance: Management on the Savage River State Forest does not fully meet the requirement to promote healthy and productive forest conditions to minimize susceptibility to damaging agents.) At SRSF many stands are stressed and/or overstocked; regeneration problems are apparent, with silvicultural analyses and silvicultural prescriptions developed through SILVAH-Oak indicating the need for treatments.

Indicator 8.1.1 requires that "Program Participants will provide a written policy acknowledging a commitment to recognize and respect the rights of Indigenous Peoples." The 2015 Transitional Minor Non-conformance against SFI Indicator 8.1.1 was closed before December 31, 2015; the program continues to be in conformance. Each management plan now contains a written policy acknowledging a commitment to recognize and respect the rights of Indigenous Peoples.

No new non-conformances were identified in the 2016 audit.

#### **2016 Opportunities for Improvement**

Three opportunities for improvement (OFIs) were identified in the 2016 audit:

1. There is an Opportunity for Improvement by completing site level plans for ESAs in the western forests.

SFI Indicator 1.1.1 requires “Forest management planning at a level appropriate to the size and scale of the operation, including: ... (i) a review of non-timber issues.”

2. There is an Opportunity for Improvement by including in forest management plans more information (known by forest managers) about the role of conifers in the natural history, historic composition, and ecology of higher-elevation portions of the western forests.

SFI Indicator 1.1.1 requires “Forest management planning at a level appropriate to the size and scale of the operation, including: ... (i) a review of non-timber issues.”

3. There is an Opportunity for Improvement in the trail program, where funding for trails maintenance may not be adequate for the need.

SFI Indicator 5.4.1 requires participants to “Provide recreational opportunities for the public, where consistent with forest management objectives.”

### **Exceptional Practices**

There were seven areas where the finding was “Exceeds the Requirements”:

1. The MD DNR program exceeds the requirements for promoting conservation of native biological diversity.

SFI Indicator 4.1.1 requires a “Program to incorporate the conservation of native biological diversity, including species, wildlife habitats and ecological community types at stand and landscape levels.”

2. The MD DNR program exceeds the requirements for retaining stand-level wildlife habitat elements.

SFI Indicator 4.1.2 requires the “Development of criteria and implementation of practices, as guided by regionally based best scientific information, to retain stand-level wildlife habitat elements such as snags, stumps, mast trees, down woody debris, den trees and nest trees.”

3. The MD DNR program exceeds the requirements for the protection of threatened and endangered species.

SFI Indicator 4.2.1 requires a “Program to protect threatened and endangered species.”

4. The MD DNR program exceeds the requirements for providing an exceptional range of high-quality recreational opportunities State Forests.

SFI Indicator 5.4.1 requires participants to “Provide recreational opportunities for the public, where consistent with forest management objectives.”

5. The MD DNR’s use of information and expert advice or stakeholder consultation in the identification special sites for protection exceeds the requirements for this indicator.

SFI Indicator 6.1.1 requires the “Use of information such as existing natural heritage data, expert advice or stakeholder consultation in identifying or selecting special sites for protection.”

6. The Maryland Forest Service has an exceptional program for outreach, education and involvement related to sustainable forest management.

SFI Indicator 12.2.1 requires “Periodic educational opportunities promoting sustainable forestry, such as

- a. field tours, seminars, websites, webinars or workshops;
  - b. educational trips;
  - c. self-guided forest management trails;
  - d. publication of articles, educational pamphlets or newsletters; or
  - e. support for state, provincial, and local forestry organizations and soil and water conservation districts.
7. The Maryland Forest Service has implemented an exceptional program for contact with local stakeholders over forest management issues.

SFI Indicator 13.1.2 requires “Appropriate contact with local stakeholders over forest management issues through state, provincial, federal or independent collaboration.”

## **Appendix 6: Interdisciplinary Team Review and Comments**

### **Savage River State Forest**

ID Team Annual Work Plan FY 2018

September 22, 2016

#### **Attendance**

Scott Campbell, Mike Friend (NRP), Sarah Milborne (Parks), Paul Busam (MDE), George Eberling, Jack Perdue, Rick Latshaw (W&HS - Wildlife), Ed Thompson (W&HS - Natural Heritage), Alan Klotz (Fisheries), John Wilson (LAP).

The ID Team discussed the Forest Stewardship Council 2016 audit report regarding 2016.1 and 2016.4.

*2016.1 — native conifer species were likely more prevalent on the landscape than they are currently. FME is considering expanding the use of native and non-native conifers on certain sites as a wildlife management component, to restore native species (both conifer and broadleaf), and possibly to adapt to climate change and invasive pests/ pathogens.*

*2016.4 — the historical presence of conifers in the management plan could be expanded to include the knowledge presented by local forestry staff during the audit, which could help set the stage for conifer objectives on the landscape.*

Margraff sunflower fieldwork was done in cooperation with the Wildlife and Heritage Service.

#### **Field Tour**

Meadow Mountain Trail – This is a cooperative program with Garrett Trails. The team reviewed the work done in the project overview. This trail is being upgraded using sustainable trail practices.

There was some discussion regarding beech management. American beech is a prolific sprouter, which has wildlife benefits but can be an issue with forest regeneration. The ID Team visited this site and no other concerns were offered.

#### **Compartment 13 – Stands 5, 6**

This proposal is to control competing vegetation using the hack and squirt method to open the forest floor for forest regeneration. Fern control was employed three years ago using a targeted spraying method. The ID Team visited this site and no other concerns were offered.

#### **Compartment 7 – Stands 43 and 38**

Stand 38 is a proposed commercial thinning. Stand 43 is proposed as a hardwood regeneration. The request was made by the review team to buffer any boulders that were found on the site. The ID Team visited this site and no other concerns were offered.

**Compartment 5 – Stands 35, 37, 38**

This proposal will include a 60-acre light hardwood thinning which will become a single stand. There is a large enclosure of Mountain Laurel on the site, which will be buffered. The ID Team visited this site and no other concerns were offered.

**Compartment 38 – Stands 19, 20, 22 - St. John's Rock**

Formerly owned by the Borden Mining Company and acquired by MD DNR in 2007, this parcel reflects the effects of previous high-grade management. Unacceptable growing stock occupies the majority of the site. This stand is to be regenerated, retaining the sparse acceptable growing stock for mast/seed sources.

This is an important historic and recreational area. It was recommended by the review team to leave any mast trees around the rock outcropping. Jack Perdue will contact Maryland Historic Trust for any issues, restrictions and recommendations for completing this management work. The ID Team visited this site and no other concerns were offered.

- On November 28, a response was received from the Maryland Historical Trust and they determined that the proposed harvest will have no adverse effect on the historic property.

**Closing Notes**

The ID Team visited no other sites. There were no other comments regarding proposals from this annual work plan.

## **Appendix 7: Citizens Advisory Committee Review and Comments**

### **Savage River State Forest**

Citizens Advisory Committee AWP FY-18 Review  
November 30, 2016

#### **Attendance**

Scott Campbell, George Eberling, Kevin Dodge, Mark Diehl, Mike Dreisbach, Rusty Leonard, Sunshine Brosi, Michael Minnick, Jim Minogue.

The Citizens Advisory Committee (CAC) discussed the ongoing construction of the St. John's Rock/Red Dog Road OHV Trail as well as the continuation of the Meadow Mountain Bike Trail, which will commence Phase II of construction when weather conditions permit. Garrett Trails will supply a summary of the construction details that will become part of the final FY-18 AWP write up.

The sunflower planting on the Margraff Plantation to encourage mourning doves to frequent the area was discussed. Inquiries were made regarding the planting of non-native species for wildlife. Native species should be considered for future planting endeavors. CAC members were curious as to what kind of interest this project would create with local hunters.

A review of each silvicultural proposal in the FY-18 AWP was conducted.

Compartment 1: No specific comments concerning the herbicide control efforts.

Compartment 5: Discussion revolved around the 11-acre mountain laurel exclusion of the proposed harvest as potential Appalachian cottontail (*Sylvilagus obscurus*) habitat. Such areas are known habitat for the Appalachian cottontail and harvesting activities may encourage the immigration of eastern cottontails (*Sylvilagus floridanus*) into the area via the disturbance of the skid/haul roads that would be built in order to harvest the timber. Forest Service personnel noted that no such concerns/findings were raised at the interdisciplinary team review of the site that was attended by Wildlife and Heritage staff whose expertise centers on rare, threatened and endangered species like the Appalachian cottontail.

Compartment 7: No specific comments were noted concerning the proposals.

Compartment 11: The steep topography of the site was noted. The committee was advised that all proper BMPs will be implemented to ensure that sedimentation and runoff will be minimized and the water quality of the area will be preserved.

Compartment 13: It was noted that this site was proposed in previous work plans, but the lack of regeneration within the stand has hindered any harvest activities. Further herbicide work will be

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Compartment 7: No specific comments were noted concerning the proposals.

Compartment 11: The steep topography of the site was noted. The committee was advised that all proper BMPs will be implemented to ensure that sedimentation and runoff will be minimized and the water quality of the area will be preserved.

Compartment 13: It was noted that this site was proposed in previous work plans, but the lack of regeneration within the stand has hindered any harvest activities. Further herbicide work will be

conducted on the interfering understory in order to further open the forest floor to diffuse sunlight and encourage desirable regeneration. The fern layer of the stand had been treated by forest personnel three years ago in a first step toward regeneration establishment.

Compartment 36: The proximity of the site to the Savage Ravines Wildlands was noted. The proposed harvest will in no way impact the wildland. Public safety concerns revolving around trees that lean over the county road were discussed. These trees will be removed as part of the harvest. Rock outcrops present in the stand will be buffered to preserve the habitat niche.

Compartment 37: No specific comments were made regarding the silvicultural prescription for the site, but a suggestion was made to utilize the access to the harvest as a means to clear the section of the Big Savage Hiking Trail that crosses the compartment. Given that recent weather events and gypsy moth infestations have caused widespread mortality in the area and many of the trees have fallen across the trail making traversing it a challenge, the timber operator could remove the larger obstacles as part of the harvest contract.

Compartment 38 Thinning: The proximity of the harvest to the St Johns Rock/Red Dog Road OHV Trail was noted. Forest service personnel reminded the group that even with the addition of the trail, the area still remains a working forest and will not interfere with the silvicultural work being done throughout the management area.

Compartment 38 Regeneration Harvest: Concerns for the site as known Allegheny wood rat (*Neotoma magister*) habitat were raised. Such sites would require implementing a 200 meter (31 acre) no cut buffer around the rock outcrop, eliminating more than half of the proposal. A request was made for specific records verifying the area as known wood rat habitat. Forest Service personnel noted that no concerns regarding wood rat habitat and/or findings were mentioned during the Interdisciplinary Team review of the site that was attended by Wildlife and Heritage staff whose expertise centers on rare, threatened and endangered species like the Allegheny Wood Rat. It was noted that the distance between known wood rat habitat and the site was of great enough distance that did not warrant any extra buffers to be implemented.

Also, with the proximity of Braddock's Road to the site and the soon to be constructed OHV trail, the suggestion was made to use the increased visitation to the area as a chance to inform and educate the public about the historical significance of the landmark.

Compartment 77: Questions arose concerning the proximity of the ESA "Warren's Grove" to the harvest site. It was explained that the objective of the proposed harvest is to enhance the management area by promoting the growth of native white pine that is found throughout the stand in an effort to create a mixed conifer hardwood stand. This harvest also serves to meet an "Opportunity for Improvement" issued by the Certification Auditors to increase the amount of conifer and mixed conifer stand on the forest landscape.

Members of Garrett Trails suggested that a cooperative effort with Savage River State Forest personnel be undertaken to secure Recreational Trail Grants in order to increase the amount of trail maintenance that is completed each year on the forest.

Closing notes: CAC members acknowledged their appreciation for the new Annual Work Plan format and the amount of technical information that is presented.

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