

SAVAGE RIVER STATE FOREST ANNUAL WORK PLAN

FISCAL YEAR 2021






The mark of
responsible forestry



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

SFI-00050

Prepared:	 (Forest Manager)	<u>7/13/2020</u> Date
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**Savage River State Forest
FY-21
Annual Work Plan**



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Compartment 14 Stands 1, 13, 19: *30.5-Acre Hardwood Thinning*

Compartment 29A Stands 2, 4, 7, 10, 11, 17: *50.6-Acre Conifer 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 mixed 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 2,800 acres of conifer plantations that were 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 over the past nine decades. 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-2021 Annual Work Plan for Savage River State Forest was formulated in 2019. 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-21 Annual Work Plan for Savage River State Forest details seven land management projects that will be the focus of the State Forest management staff for FY-21. 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 intended 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 2019 FSC/SFI Certification Audits.

2. Forest Stand Delineation, Inventory and Monitoring – Completion of the project to re-inventory and redefine stands on the entire forest. This critical project will continue in FY-21. To date, 100% of the data collection in harvestable stands is completed. Areas of HC VF including wildlands, ecologically significant areas, old growth, old growth ecosystem management areas and areas that preclude timber harvest operations will be inventoried secondarily to the harvestable areas. 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 and exotic plants forest wide.

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

3. 7 Silvicultural projects including:

6 Intermediate Harvests on 354.6 acres and 1 Salvage Harvest on 8.7 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 since its inception, 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 is

enjoyed 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-21 Annual Work Plan outlines 7 harvests on 363.3 acres, producing a harvest of approximately 1,000,000 board feet of sawtimber and accounting for an estimated \$250,000 worth of raw wood products entering local markets. Much of the silvicultural work laid out in this work plan is focused on initiating seedling development to better ensure 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 safeguard the long term sustainable management of these important forest resources. The cultural operations and management projects outlined within the FY-21 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-21 Land Management Project Proposals

Approximately 363.3 Acres

Map Key

<i>1. Compartment 4 Stand 22</i>	<i>8.7-Acre Hardwood Salvage</i>
<i>2. Compartment 11 Stands 58, 59, 60</i>	<i>42.3-Acre Hardwood Thinning</i>
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<i>7. Compartment 77 Stands 12, 13</i>	<i>54-Acre Hardwood Thinning</i>

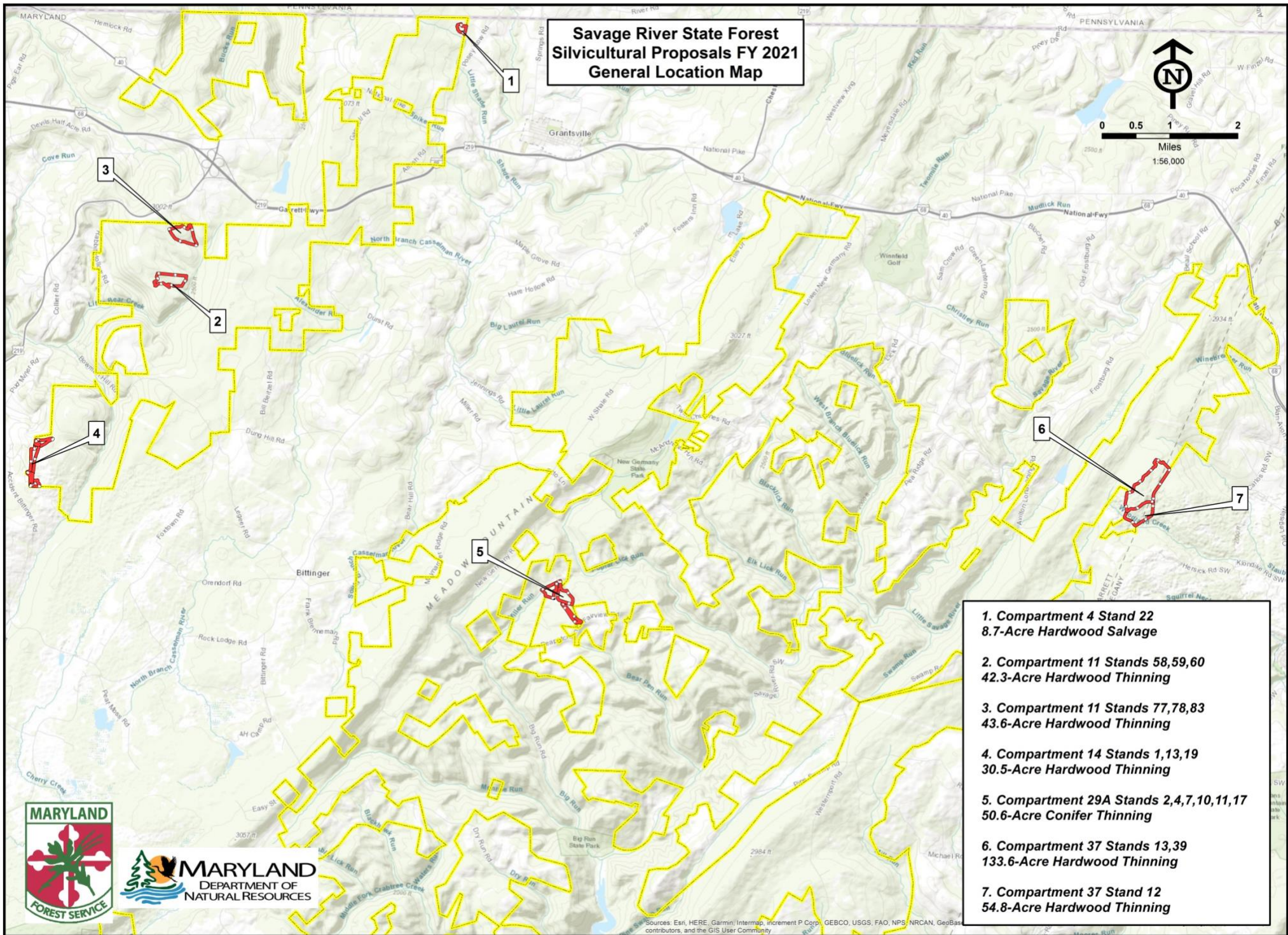


Figure 1. General location map of FY-21 silvicultural proposals

IV. Special Projects - Forest Resource Management and Planning

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

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 seven years, broad resource assessments have been 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. Revisions and updates to the Sustainable Management Plan were completed in April of 2019.

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. A minor corrective action request was issued by SFI in regard to leaking equipment on a harvest site and the apparent absence of safety equipment. A corrective action plan was formulated that would add the items to the BMP checklist and confirmation of compliance would be done during each site visit by Forest Service Staff or agents.

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. Initial stand data collection has been completed on the harvestable areas of the forest using the SILVAH Inventory System developed by the US Forest Service which incorporates intense surveys of both the overstory and understory to assist in the formulation of appropriate silvicultural prescriptions in specific forest types. The demand for this important data set is increasingly evident as special projects evolving out of demands placed by Forest Certification Standards utilize this data set for project planning including the Annual Work Plan and the Non-Native Invasive Species Inventory.

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 more rapid and timely responses. 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 and prescribed fire; NNIS monitoring and control work; 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 107 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 currently has 336 miles of boundary line, 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 100-yard shooting range on the forest that is open to the public year round located at 3250 New Germany Road. 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.

The shooting range is open daily from 8 a.m. to dusk and offers hunters an ideal location to sight in weapons. The range features ten stations with distances ranging from 25 to 100 yards. Hunters can pay the \$5.00 daily fee at the range using envelopes provided. The annual pass costing \$25 and the family pass costing \$50 are available at the Forest Headquarters Office. Rules and regulations are posted at the range, with the only restrictions being no fully automatic weapons and no clay pigeons.

VI. Recreation

A. Recreation Opportunities (See Figure 2 p. 12)

1. Hiking, Biking and Horseback Riding Trails

Savage River State Forest has over 70 miles of trails open to hikers, mountain bikers and horseback riders of any ability. Not all trails are open to all recreational pursuits and it is recommended that before engaging in any activities visit or contact the state forest headquarters to become aware of any trail restrictions. A backpacking permit must be obtained at the forest headquarters or at any of the self-registration areas. Trail guides featuring a topographic map and trail descriptions can be purchased at the forest headquarters.

2. Off Road Vehicles

Snowmobile and off-road vehicle operators can enjoy many miles of scenic trail along the Meadow Mountain Trail, East Shale Road, Margraff Plantation, Negro Mountain Trail and the newly constructed St. John's Rock ORV Trail. Unlike the aforementioned trails, the St. John's Rock ORV Trail is the first trail on Department lands ever designed specifically for ORV enthusiasts. Features include a multi-site primitive campground designed to support ORV riders, children's riding trails within the campground, technical spur loops and hare scramble style trail sections for all terrain vehicles and motorcycles, a full-size rock crawl area for jeeps and four-wheel drive vehicles and miles of forest access roads for all purpose riding opportunities. The total trail system is approximately 13 miles in length with varying challenges for riders of all skill levels. The trail officially opened to the public on July 23, 2017. Usage statistics for the second year of operation can be found in Appendix 1.

Be sure to display a current Department of Natural Resources ORV permit, available at the forest headquarters or online at www.dnr.maryland.gov.

3. Hunting

Hunting is permitted throughout the forest except where posted with safety zone signs. The 55,000 acres of Savage River State Forest includes two state park areas (New Germany and Big Run) where hunting is prohibited. The forest boundaries are marked with yellow paint on trees - a yellow bar as you enter the forest and a yellow dot as you exit the forest. Hunting on or crossing private land within or near the State Forest requires the written permission of the land owner. Parking is permitted along roadways as long as traffic is not blocked. Hunters must have a valid Maryland Hunting License and should refer to the current Hunting & Trapping guide for season dates and specific regulations.

Several access roads are opened every fall to accommodate hunters. These gated roads are opened prior to squirrel season in September and remain open through January 31. A copy of the road-opening schedule is available in the Forest Headquarters Office. Opened roads can be used by all hunters and allow for vehicular traffic. Due to the nature of these roads, the use of four-wheel drive is recommended. Handicapped hunter access roads are also available. More details about handicapped accessibility appear in this brochure and on the current road-opening schedule.

*Hunter Safety Classes, required for the purchase of a license, are taught periodically through the Department of Natural Resources. These classes are usually offered in the county at one of the local State Parks.

4. Trapping

Trapping is permitted both on land and in the water. A permit can be issued for trapping on Savage River State Forest at the Regional DNR Wildlife Office in Flintstone. Trappers are required to obtain a certificate of trapper education from the Department of Natural Resources. Trapper education courses are held statewide. Refer to the current Hunting & Trapping Guide for complete regulations. A valid hunting license is required when applying for a trapping permit.

5. Fishing

Anglers with a Freshwater Fishing License have the opportunity to catch multiple species of fish in the Savage River Reservoir including walleye, large-mouth bass, smallmouth bass, yellow perch, bluegill and several trout species. Anglers with a trout stamp can fish the Savage River for wild brook trout and stocked brown and rainbow trout. Tributaries of the Savage River, including Middle Fork, Poplar Lick and Blue Lick to name a few, provide a unique backcountry fishing experience for native brook trout that is unsurpassed in the region. The majority of the Savage River watershed is within the Zero Creel Limit Area for brook trout and can only be fished with artificial flies and lures. For regulations, creel limits and special management areas consult the Maryland Freshwater Sportfishing Guide or contact the Western Maryland Fisheries Office at (301) 334-8218.

6. Boating/Paddling

The Savage River Reservoir provides excellent boating and paddling opportunities. Three public boat launches offer convenient access at Dry Run Road, Big Run State Park and ¼ mile north of the dam breast on Savage River Road. Gasoline engines are prohibited on the reservoir. Recreational whitewater releases occur periodically throughout the year on Savage River below the dam that are sponsored and coordinated by the Upper Potomac River Commission, Savage River State Forest, Garrett College Adventuresports Institute, Verso-Luke Mill and several commercial boating outfitters. The events are at no cost to the participants, but donations are accepted to cover the cost of shuttle services and on site restroom facilities.

7. Winter Recreation

Cross-country skiers and snowshoers of all abilities can enjoy a winter wonderland on the New Germany and Mount Aetna trails. The Asa Durst Trails are recommended for a backcountry snowshoe experience. Snowshoers must be careful to walk beside and not on cross-country tracks as it disrupts them.

8. Geocaching

Currently, 28 geocaches are located throughout Savage River State Forest for those interested in testing their navigational and tracking skills. All geocaches must be reviewed and approved by the staff before being placed anywhere on the forest. Applications and general rules for geocache placement are available at the state forest headquarters.

9. Maps

Brochures and maps are available at the Savage River State Forest Headquarters Office located at 127 Headquarters Lane, Grantsville, Maryland 21536.

B. Recreation Proposals

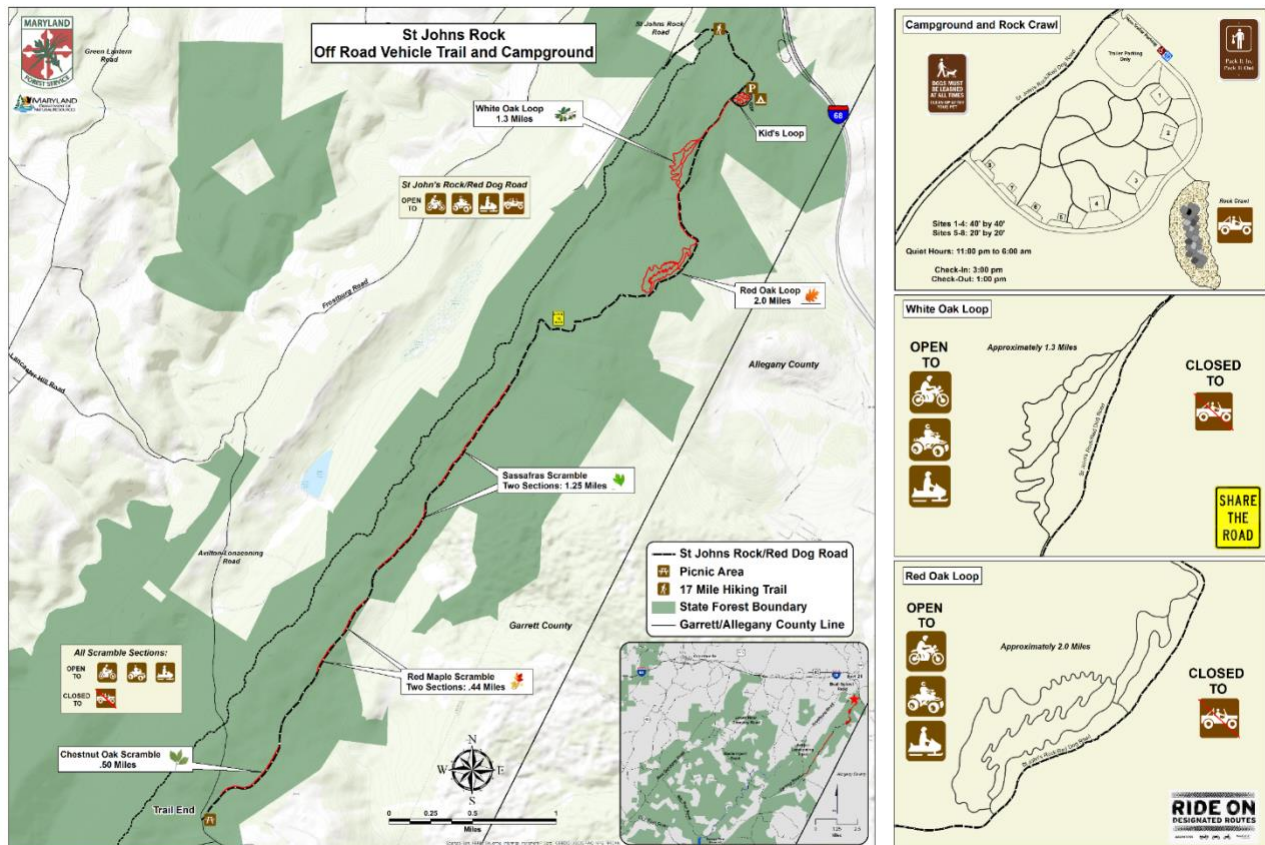
National Recreation Trails Grant Requests: To Enhance Recreation and Trails Opportunities for Visitors of Public Land.

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 (2) to maintain the newly developed 13-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.



12 Figure 3. St. John's Rock ORV Trail brochure

2. 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. Groundbreaking occurred in July 2017 and this phase of construction extended from Frank Brenneman Road to Otto Lane adding approximately 7.5 miles of resurfaced trail to the ongoing project.

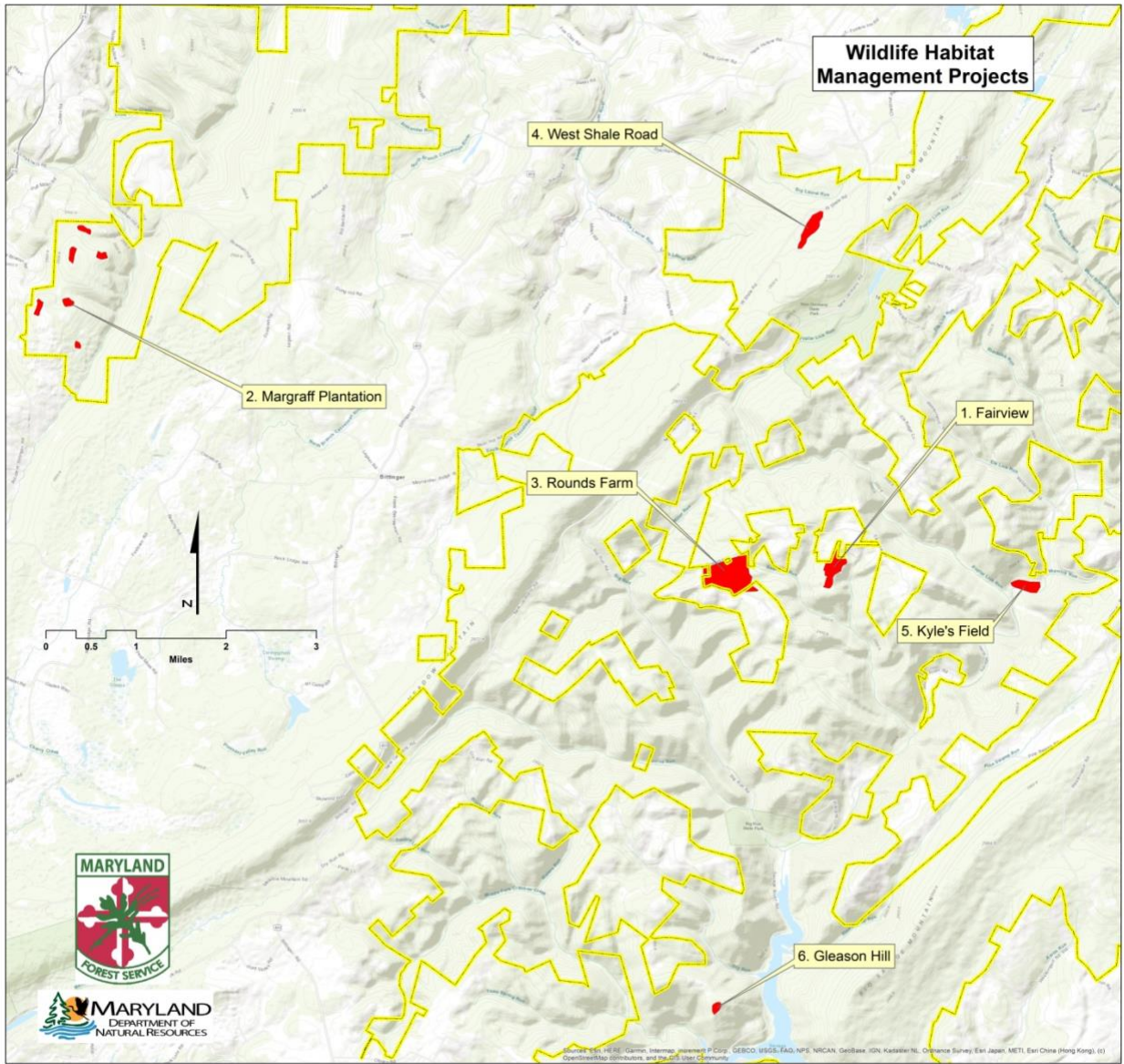
Grant funds have been made available from the Maryland State Highway Administration Recreational Trail Program and the Appalachian Regional Commission Area Development Funds to complete the final 3-mile phase of the project that extends from the southern end of West Shale Road to New Germany Road. Approximately \$400,000 dollars will be used to construct the trail, stabilize the trail surface with aggregate, install split rail fencing at the trail head as well as interpretive signage along the riding route, mobilization/demobilization of construction equipment and contingency costs. Upon completion of the project, a total of over 10 miles of new riding trail surface will be available for visitor recreational opportunities. To complement the new construction, three interpretive panels have been placed along the trail to educate trail users about the rich history of Garrett County, particularly the Native Americans that inhabited the land from the Paleo-Indian Period until the 17th Century.

VII. Wildlife Habitat Management Projects

A. General Wildlife Habitat Maintenance

Approximately 38.5 acres of wildlife specific projects have been implemented throughout the state forest. These projects are located in the Margraff tract of Compartment 14 east of Accident, MD, the Nature Conservancy acquisition of Fairview Road, the "Rounds Farm" located off Pea Patch Road, West Shale Road, "Kyle's Field" off Savage River Road and Gleason Hill. General practices include liming and fertilizing as well as planting of cover and grain crops, where appropriate. Plantings include millet, peas, corn, turnips (*Brassica spp.*), warm season grasses, native wildflowers and clover (See Wildlife Habitat Management Projects map and summary, p. 14).

As part of the Mentored Hunt Program, a stocked pheasant hunt will take place on the Rounds Farm in late November. This is a do-it-yourself hunting opportunity for junior license holders, apprentice license holders and lapsed hunters. A random lottery drawing will take place to fill all available slots and all successful applicants will receive a packet of information with maps and other helpful information. More information is also available on the Maryland DNR Wildlife and Heritage Service web page: http://dnr.maryland.gov/wildlife/Pages/hunt_trap/Mentored-Hunt-Program.aspx.



Area	Species Planted	Acres	Fertilizer
1. Fairview Road	Clover mix	9	1200 lbs 10-20-20
2. Margraff Plantation	Chickory	1	700 lbs 19-19-19
	Brassica mix	2	600 lbs 10-20-20
	Corn	1	
3. Rounds Farm	Corn	5	2600 lbs 19-19-19
	Clover mix	3	600 lbs 10-20-20
	Millet mix	2	1 ton lime
	Peas	2	
	Sun hemp/sorghum	0.5	
	Brassica Mix	0.5	
4. West Shale Road	Clover mix	2	400 lbs 10-20-20
	Brassica mix	2	200 lbs 19-19-19
	Millet mix	0.5	
5. Kyle's Field	Clover mix	3	600 lbs 10-20-20
6. Gleason Hill	Clover mix	4	

Figure 4. Wildlife Habitat Management Project Areas and Applications

VIII. Ecosystem Restoration / Protection Projects

A. Non-Native Invasive Species (NNIS) Control

Across the State, a biological invasion of non-native and invasive plants is spreading into 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 including 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 2 and 3).

The State Forest staff has treated and/or is monitoring several plant colonies or sites including: five 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 (*Fallopia japonica*). Several areas of Savage River State Forest have become infested with the invasive plant Japanese knotweed (*Fallopia japonica*). 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. Recent late season snowfalls and above average rainfall have limited any attempts to control the species. 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 19 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 20 and beyond until the plant has been eradicated. A previously discovered patch of mile-a-minute weed in Compartment 38 near the St. Johns Rock ORV Trail that was seemingly removed during the excavation for the trail campground reemerged and has been treated. Monitoring of the area will continue and the site will be treated as necessary in order to eradicate this plant from the site.

4. Tree-of-Heaven (*Ailanthus altissima*) Individual stems of the exotic invasive tree-of-heaven 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

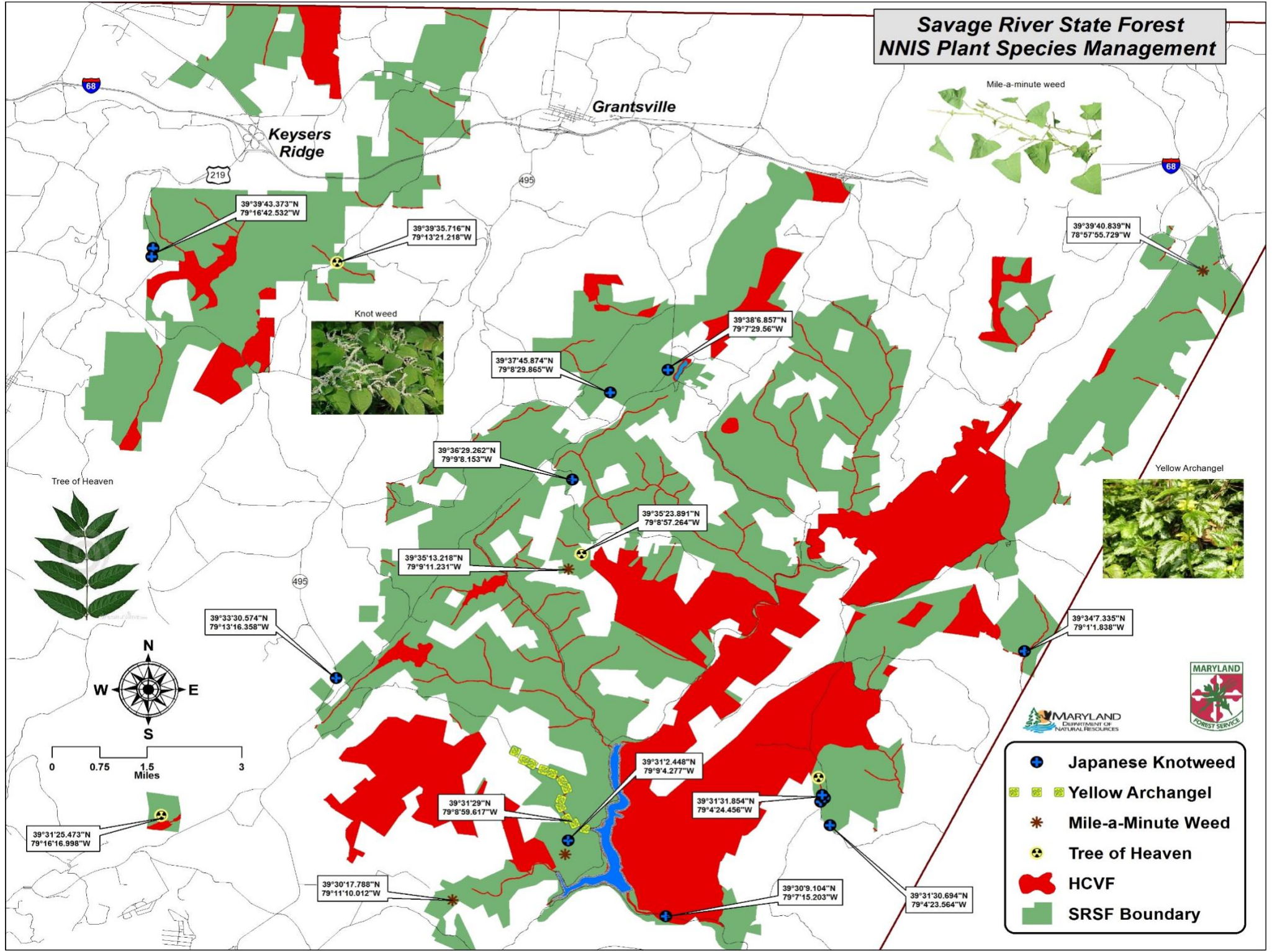


Figure 6. Map of NNIS treatment areas on Savage River State Forest

IX. Monitoring and Research Projects

A. Monitoring

1. Silvicultural Activities

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 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 regimens 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 write-ups of each project are available at the State Forest Office)*

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 continuing 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).

The initial release of the virus was conducted in mid July 2016. A second APHIS permit for additional introductions of the virus to the original study area of Russell Road as well as an additional site located of Jacobs Road in Compartment 42 was applied for in May 2017 and treatments commenced in July and August of 2017. An on-site review was conducted by APHIS risk assessment personnel on August 9, 2018 to ensure that all standards of protocol for such a release were adhered to throughout all phases of the ongoing study. All aspects of the field trials were within acceptable tolerances and the current research permit for both projects will be extended through 2019.

2. Eastern Hemlock: Target-tree Release to Improve the Sustainability of Eastern Hemlock (*Tsuga canadensis*) in the Southern Appalachian Mountains. US Forest Service Southern Research Station and North Carolina State University.

This ongoing project will develop and validate a silvicultural tool that improves the health and sustainability of eastern hemlock, an ecologically keystone species in the southern Appalachians threatened by HWA. Individual or small clusters of "target" trees (i.e., suppressed

or intermediate eastern hemlocks with moderate to good crown health) will be released by removing or girdling other stems competing for sunlight directly above and adjacent to the target trees. Increased sunlight is expected to improve hemlock crown health via improved carbon balance, enhanced foliage production, and reduced HWA settlement rates relative to unreleased trees. Treatments will be replicated at a number of southern Appalachian sites and will evaluate release by girdling versus felling and variations on the size of the resulting canopy gap. Operationally, the tool is expected to prolong hemlock health and survival and increase the efficacy of existing HWA management tools (e.g. biological and chemical control) when integrated with them (Jetton, Robert M., Mayfield, Albert E., Keyser, Tara, and Rhea, James 2017). The project will involve fifteen treatment sites; 10 located in the northern end of Wolf Swamp in Compartment 16 and five located along an unnamed tributary of Elk Lick Run in Compartment 26. Post treatment data collection was completed on all sites in March 2018 and again in July 2018 involving hemlock health at one year, adelgid density, vegetation measurements and data analysis. Follow up data collection and analysis is scheduled for Fall 2018 and will continue through the Fall of 2019.

3. Bobcat: Population Estimate and Structure of Bobcats (*Lynx rufus*) in Western Maryland. University of Delaware Department of Wildlife Ecology.

Currently, bobcats are the most widely distributed native felid throughout the continental United States. However, this distribution was threatened in the late 19th century. During this time, several states observed a drastically lowered population or full extirpation. Due to forest regeneration and a well-regulated harvest, bobcats have recovered much of their historic range. Currently, bobcats are seen regularly throughout Garrett and Allegany counties and are becoming more common in counties to the east. However, the estimated population size of the species has not been documented. Preliminary results from a predator camera survey performed in western Maryland estimated bobcat density ranged from 0.08-0.20 bobcats/mi². Land managers require a better understanding of the current population of bobcats in the region.

A hair-snare survey will be implemented targeting bobcats in 3 study areas within 2 counties of Maryland. These study areas will be focused on public land in the forms of: Potomac State Forest, Savage River State Forest, and Green Ridge State Forest. We will place 20 hair snares at each of the 3 study areas, totaling 60 for the region. Each snare will be active for 60 days from mid-December to mid-February. The snares will be placed at a rate of 1 snare per 3km in habitat most likely to be occupied by a resident bobcat, based on previous literature. At each of the 60 snares we will place a game camera to monitor the snare. The camera data will give researchers a better understanding of the efficiency of the snares. The hair collected during the 60-day survey will be analyzed at the genetics laboratory to determine: species, sex, individual, and relatedness among individuals. Using a capture-mark-recapture model, we will determine a density of bobcats in the region. Additionally, camera data will be analyzed as a separate capture-mark-recapture study to estimate bobcat density. Bobcat density estimates based on camera data will be compared to estimates based on hair-snare data to determine if camera surveys could function as a viable cost-efficient alternative to estimate bobcat density.

The objectives of this research include estimating the bobcat population size, determining the sex ratio of the species and comparing the efficiency of camera surveys to hair-snare surveys

to estimate bobcat densities. This research will provide baseline information about the population size and structure of bobcats in western Maryland. Additionally, this study will improve efficiency of field methodologies. The Maryland Department of Natural Resources lacks data on the current population size and structure of bobcats in the region. This research will estimate the abundance and population dynamic of bobcats to aid state managers in understanding the ecology within western Maryland (Ness, 2018).

4. Late Successional Forest Management Project. The Nature Conservancy.

The MD/DC Chapter of The Nature Conservancy is collaborating with Maryland Forest Service and the Maryland Wildlife and Heritage Service to implement a “Late-successional Forest Management Project” in western Maryland. The long-term goal of this project is to demonstrate the potential of using Structural Complexity Enhancement (SCE) methods to accelerate the development of late-successional characteristics in western MD forests. Young- to-mid successional forests lack the structural complexity present in diverse, late-successional forests. However, “maintain and enhance species and structural diversity” is one of the climate adaptation strategies which would enhance climate resilience at landscape-scale. TNC will partner with Northern Institute of Applied Climate Science (NIACS), to use their Forest Adaptation Resources as a guide in developing this project. TNC, in consultation with DNR resource professionals, have identified two treatment sites, plus a reference site (a designated old-growth area) at Savage River State Forest (SRSF) to implement this project. The two treatment sites are located in between a wildland and an Ecologically Significant Area (ESA). There are “confirmed old growth sites” within the OGEMA, that are limited in size and connectivity. Hence, applying this type of silvicultural treatments with primary objectives of fostering old-growth conditions, would enhance old growth ecosystem functionality, which is a recommended action in the Sustainable Forest Management Plan for SRSF.

SCE is the use of a combination of silvicultural techniques to promote structural complexity in forest ecosystems including creating multi-layered canopies, increasing the number of snags and coarse woody debris, and increasing the number of large living trees. This complexity in vegetation structure and age-class distribution has a direct effect on the biological diversity in a forested system. At landscape scale, late-successional forests are a necessary element of landscape diversity, which enhances climate resilience. Recent studies have suggested that forests managed with SCE treatments have the potential to increase carbon storage and provide additional climate change mitigation benefits. The proposed project is part of a larger initiative to demonstrate different SCE treatments to foresters and landowners. In consultation with DNR resource professionals, TNC will develop communication materials such as pamphlets, infographics, videos and presentations to disseminate the learning outcomes of the project. In addition, field tours and workshops will be organized for foresters and landowners to promote understanding of SCE techniques as an option in forest management. Landowner adaptation of SCE will have a positive effect on the natural resources of Maryland by improving late-successional wildlife habitat and landscape diversity. Enhanced climate resilience of the landscape and improved ecosystem services will have numerous benefits to the natural environment and the citizens of the state.

5. Crayfish Collection. Carnegie Museum of Natural History Section of Invertebrate Zoology.

Collections of freshwater crayfish are planned during the week of September 23-27, 2019. Collections will target two species of crayfish, including *Cambarus bartonii* and *Cambarus carinirostris* as part of an ongoing project of the Section of Invertebrate Zoology at the Carnegie Museum of Natural History. Collections will take place in Savage River, Big Run, Bluelick Run and Mudlick Run.

Sampling of crayfish is requested to study the broad-scale genetic and morphological variability of these species across their respective geographic ranges to assess their taxonomy, systematics, and species status. *Cambarus bartonii* is thought to represent a species complex made up of multiple, as yet undescribed, species. Complicated morphological characters, and confusing geographic patterns associated with these characters, have hindered the study and resolution of this complex for many years. However, recently gathered genetic data applied to this group has proven useful in detecting geographic patterns and have helped elucidate differences among populations. *Cambarus carinirostris* is a very closely related species to *C. bartonii*, and until recently, was considered one of its subspecies, but questions remain as to whether they are indeed separate species. A closer examination of these species is needed to help resolve lingering questions about this species complex.

Cambarus bartonii has a broad range in the eastern US, ranging from southern Canada (southeastern Ontario to New Brunswick) southward through the Appalachian Mountains from Maine to northeastern Georgia. *Cambarus carinirostris* has a smaller geographic distribution, ranging from the western pan-handle of New York south through western Pennsylvania, extreme western Maryland and eastern West Virginia.

Major genetic differences in freshwater crayfish are often detected within, and definitely between, watersheds, which makes a dense sampling scheme necessary, so that variation can be detected at an appropriate geographic scale to elucidate genetic patterns of variation across the landscape and help identify any unique populations. To detect rare genetic variants, 20+ individuals should be collected to reduce the effects of sampling error, which may adversely impact estimates of relationships. These larger samples also aid studies using morphological characters by bolstering levels of statistical significance.

Populations in Maryland currently represent a huge hole in the sampling of these species ranges, and existing data from Pennsylvania suggests that Maryland populations would be informative and helpful in delimiting geographic ranges of potential new species.

Crayfish will be sampled from throughout Maryland to broadly cover the geographic ranges of the two species within the state to account for geographic variation that may be present within each species. Both species are common throughout their ranges and are not currently of conservation concern. Indeed, these are some of the most commonly encountered crayfish species seen in Eastern US streams. Samples collected in Maryland will be added to a broader dataset for these species, which includes a number of sites sampled throughout Pennsylvania, West Virginia, Virginia, North Carolina, and Georgia.

Impacts of sampling at a local scale will be minimal. Specimens are usually collected with a seine after moving or flipping larger rocks in streams and directing crayfish into the seine using a kicking motion and the flow of the stream. Large rocks are then returned to their original positions. Sampling usually takes anywhere from 30 to 60 minutes, depending on ease of access and other variables. Only a single trip to each site will be made (i.e., a one-time sampling event). Other incidental species of crayfish (non-listed species) and aquatic insects are generally also collected in the process, but numbers retained are usually quite minimal and should not place an undue strain on local populations. All specimens of crayfish (and incidental insects) will be deposited into the collections of the Carnegie Museum of Natural History in Pittsburgh, PA where they will be available of current and future research projects (Fetzner, 2019).

X. Silvicultural Proposals

COMPARTMENT 4 Stand 22

FY-21

Description/Resource Impact Assessment

Location: This 8.7-acre proposal is located 1,500' west of Posey Row Road, approximately 1.3 miles north of the intersection with State Route 40.

Forest Community Type and Condition: This site contains an 80-year-old small sawtimber mixed upland hardwood stand with an average merchantable diameter of 12.7 inches. Red maple is the dominant overstory species (41%) followed by northern red oak (16%), black cherry (12%) and hickory (6%). This stand is stocked at 64% relative density with an average basal area of 99.5 ft²/acre and an estimated volume of 5,170 board feet/acre. Approximately 59% (58.6 ft²/acre) of the present stand is categorized as unacceptable growing stock. Oak regeneration from all cohorts occupies approximately 5% of the management unit and saplings of desirable species occupy 18% of the proposal area.

Interfering Elements: Striped maple and witch hazel are present as tall woody interference on 82% of the stand and low woody interference is represented by black birch and witch hazel on 39% of the management unit.

In addition to interfering vegetation, the presence of white-tailed deer can have a negative influence on the regeneration success of the stand. Overbrowsing 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 high. 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 This stand was heavily thinned in 1998. The stand adjacent to the southern boundary of the proposal was thinned in 2014. No evidence of recent fire activity or sign of significant insect infestation was observed within the stand.

Rare, Threatened and Endangered Species: No rare, threatened or endangered species were discovered on the site.

Habitats and Species of Management Concern: At this time no habitats or species of management concern have been identified on the site.

Water Resources: Drainage from the site is southward into Little Shade Run within the Casselman River watershed. The proposed silvicultural treatment will be outside of all HCWF 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 the site is categorized as Cookport and Ernest very stony silt loams, 8 to 25 percent slopes (CuD). Abundant stones are found on and in the soil, mainly composed of sandstone, drainage ranges from poor to well-drained and water moves slowly through the subsoil. Equipment limitations are moderate due to the water table being close to soil surface in late winter and early spring. The site has high 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: Recreational Resources: No developed recreational resources are currently found within the management unit. Hunting is the main recreational activity in this area of the forest and opportunities for recreation may be limited or disrupted for the duration of the timber harvest.

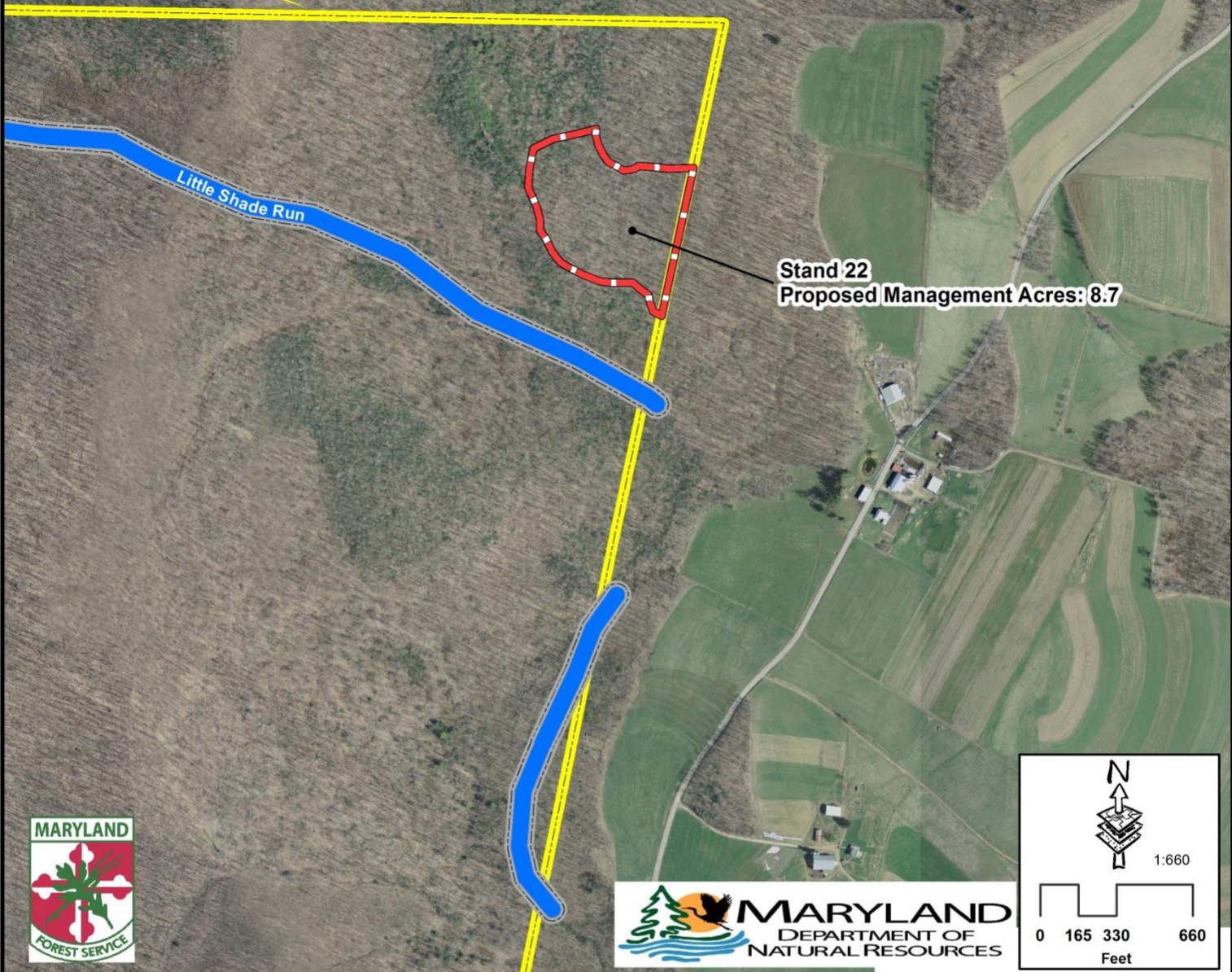
Management and Silvicultural Recommendations

This stand succumbed to the effects of gypsy moth defoliation and all the dead trees will be harvested via a salvage operation. The harvest will be sold on a small contract to the adjacent landowner as there is not adequate volume to justify a bid sale and there is currently no established access to the site.

**Savage River State Forest
Silvicultural Proposal FY 2021
Compartment 4 Hardwood Salvage**

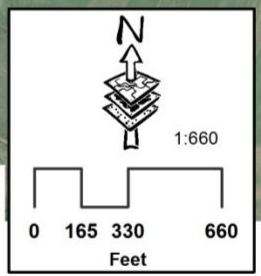
Pennsylvania




State Forest
Boundary

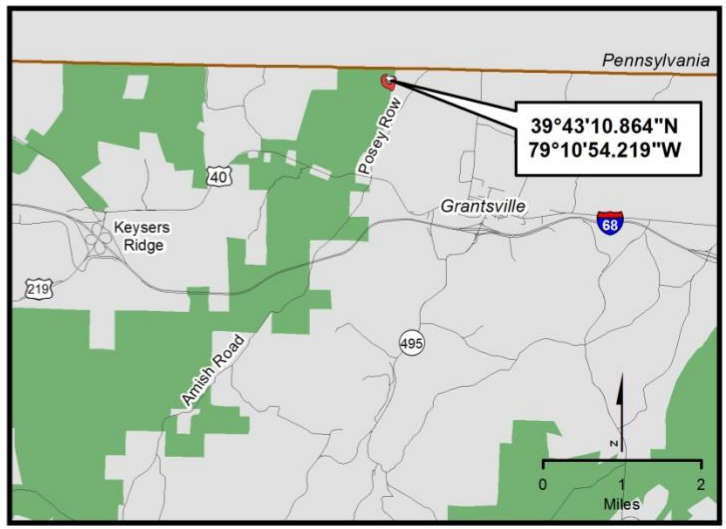


**Stand 22
Proposed Management Acres: 8.7**

Little Shade Run



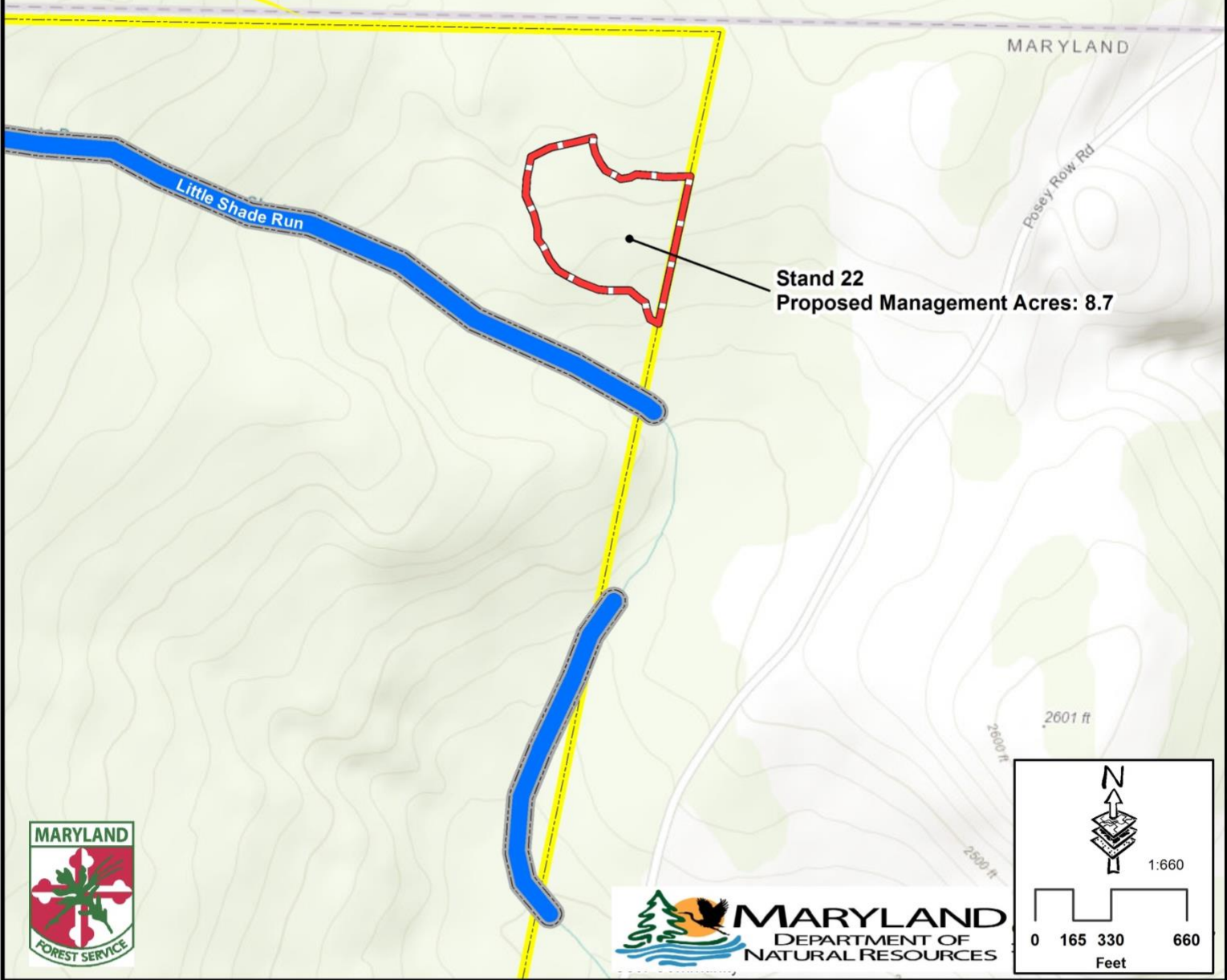
-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**









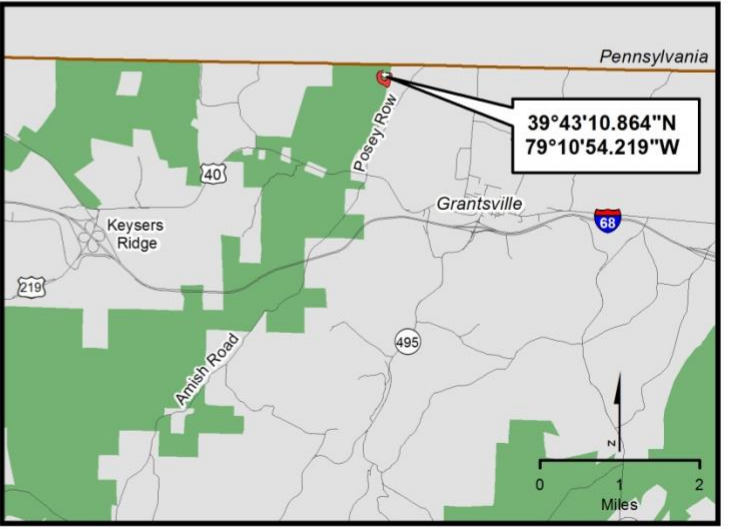
**Savage River State Forest
Silvicultural Proposal FY 2021
Compartment 4 Hardwood Salvage**

Pennsylvania

State Forest Boundary



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



Description/Resource Impact Assessment

Location: This proposal is located east of the existing forest access road and south of the high tension utility line in Compartment 11 approximately one mile south of Route 219. The access road entrance is located approximately 1.3 miles south of the Route 40 / Route 219 intersection at Keyser's Ridge.

Forest Community Type and Condition: This 42.26-acre site contains a large sawtimber mixed oak stand that is approximately 94 years old with an average merchantable diameter of 17.3 inches. The overstory consists of northern red oak (48%), red maple (28%), chestnut oak (9%) and black cherry (4%). This stand has a relative density of 93% and has an average basal area of 161 ft²/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: Understory plant competition is sufficient to cause interference with regeneration efforts, with 94% of the site containing some form of significant vegetative interference. Tall woody interference occupies approximately 80% of the stand and consists primarily of striped maple and black gum. Low woody interference occupies approximately 62% of site with the majority being green briar and witch hazel. Interfering fern levels were found on 52% of the proposal area. Non-native and invasive species were not found within the stands. This stand has not reached maturity, therefore regenerating the stand is not the primary silvicultural focus and no efforts will be initiated to the control the aforementioned interfering vegetation at this time.

Historic Conditions: State Forest records show that no silvicultural treatments have been implemented in this area since the state acquired the land. The hardwood stand north of the proposal was regenerated in 2001 and three stands to the south were regenerated; one 1994 and two in 2008. No evidence of fire was observed during the recon and there is no indication of significant forest pests or diseases in the stand 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 that would be impacted by the silvicultural prescription.

Habitats and Species of Management Concern: The eastern portion of the silvicultural proposal borders the Little Bear Creek ESA. This area includes exceptional examples of northern hardwood and hemlock forest types, spring seep communities and robust populations of numerous salamander species that occupy the habitat niche associated with small streams and seeps. All harvest activities will occur beyond the limits of ecologically significant area and input from Wildlife and Heritage personnel will be solicited in order to accurately locate the ESA boundary ensuring that the integrity of the unique area is not compromised.

Water Resources: This area drains east into Little 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 Forest Sustainable Management Plan.

Soil Resources: The dominant underlying soil types are Gilpin channery silt loams 0-20% slopes (GnB2 and GnC2). These soil types are generally moderately deep over bedrock and well drained. Degree of slope ranges from 0-10% throughout the site. Equipment limitations, potential for windthrow and the hazard of erosion is slight. High site indices are associated with these soil types, ranging from 75-85 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. 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

Given that competitive regeneration is lacking and the stand is overstocked, the planned silvicultural treatment for this site is a commercial 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. A crown thinning will be implemented, removing approximately 61 ft² of basal area/acre and reducing the residual relative stand density to approximately 62%. Removals will be concentrated on unacceptable growing stock. A portion of the larger trees will be removed as well to adequately open the canopy. Harvest volumes anticipated from removals will be approximately 5,450 board feet/acre and eight cords of pulpwood.

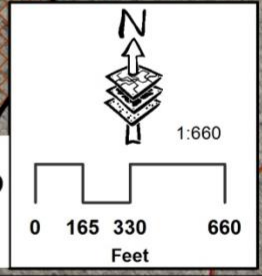
Savage River State Forest
 Silvicultural Proposal FY 2021
 Compartment 11 Hardwood Thinning

Stands 58,59,60
 Proposed Management Acres: 42.26

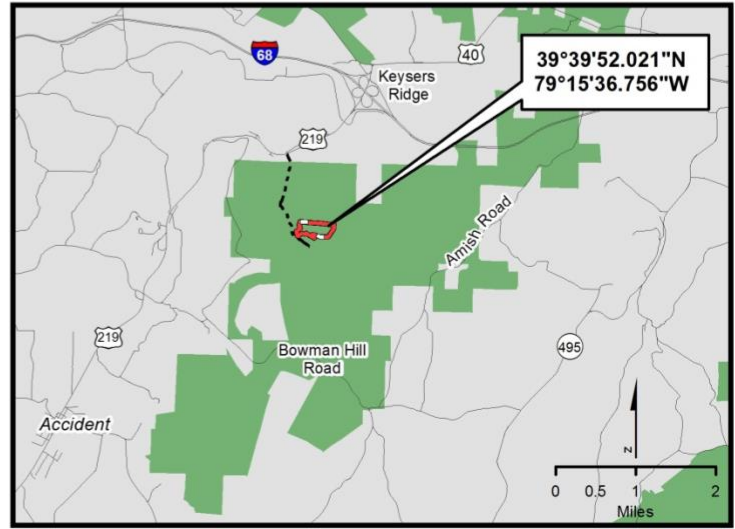
Existing Forest
 Access Road

Little Bear Creek

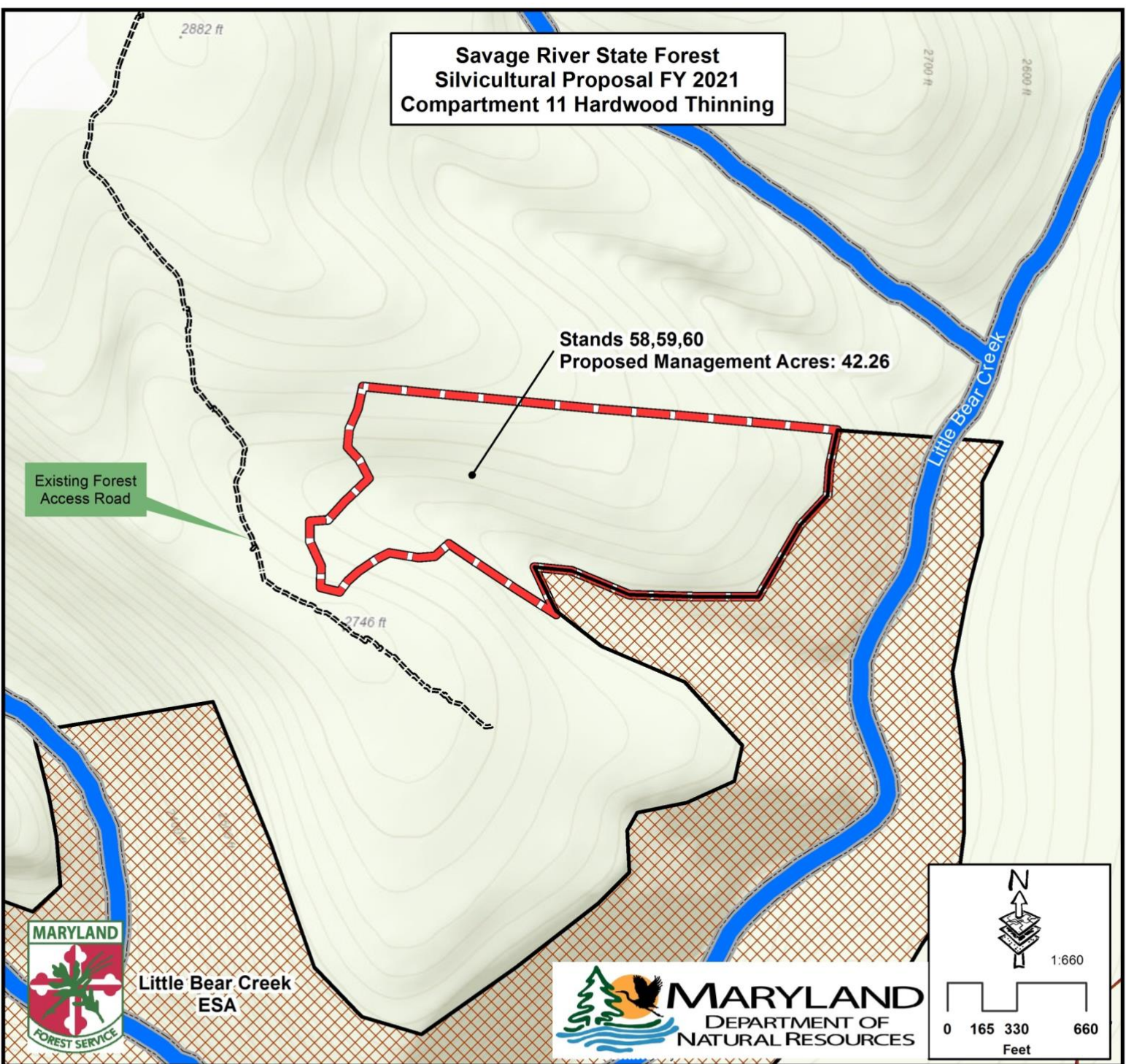
Little Bear Creek
 ESA



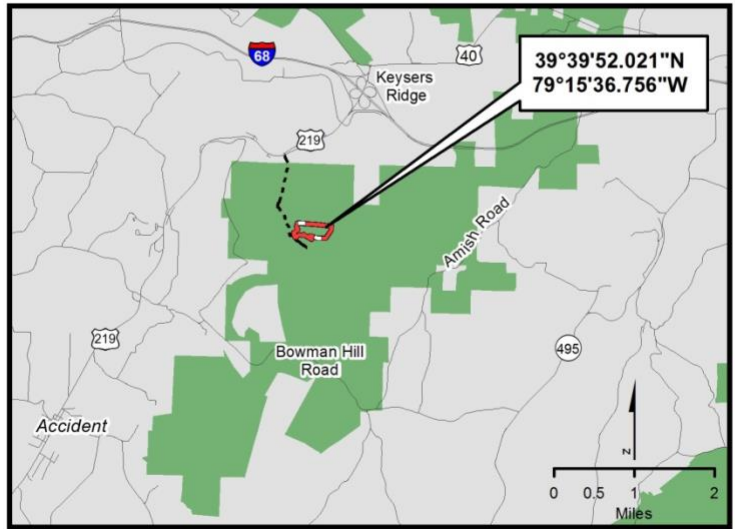
- Wildlands
- Ecologically Significant Area
- Old Growth
- Old Growth Ecosystem Area
- Wetland of State Concern
- Streams and 50' Buffers



**Savage River State Forest
Silvicultural Proposal FY 2021
Compartment 11 Hardwood Thinning**



- 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 in Compartment 11 and is accessible via a forest access road located on the south side of Route 219, approximately 1.3 miles south of the intersection of State Route 40 and Route 219 at Keyzers Ridge.

Forest Community Type and Condition: This site contains a large sawtimber mixed oak stand that is approximately 95 years old with an average merchantable diameter of 18.4 inches and an estimated net live growing stock of 14,870 board feet/acre. The overstory consists of red maple (41%), northern red oak (34%) and black cherry (20%). This stand has a relative density of 75% with an average basal area of 144 ft²/acre. Desirable regeneration is deficient in part due to the presence of the interfering elements explained in the following section.

Interfering Elements: Interfering understory plant competition is sufficient to cause complications in desirable regeneration efforts with the entire site containing some form of significant interference. Tall woody interference occupies approximately 63% of the stand consisting primarily of black birch and witch hazel. Low woody interference occupies approximately 77% of the site, with witch hazel and striped maple comprising the majority. Problematic ferns occupy 94% of the stand. Non-native invasive species (NNIS) were not observed within this stand. Regeneration efforts are not the main focus of the silvicultural prescription for this stand and no effort will be made to control interfering vegetation at this time.

In addition to interfering vegetation, the presence of white-tailed deer can have a negative influence on the regeneration success of the stand. Overbrowsing 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 future 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 records indicate that the proposal site had been partially thinned in 1992 and the harvest was limited to the ridge top. The adjacent hardwood stand to the east had been regenerated in 2004. No evidence of fire, significant forest pests or diseases was observed during the stand inventory.

Rare, Threatened and Endangered Species: No rare, threatened or endangered species have been identified on the site that would be impacted by the silvicultural prescription.

Habitats and Species of Management Concern: No habitats or species of management concern or any species that would be impacted by the silvicultural prescription were discovered during the proposal review process.

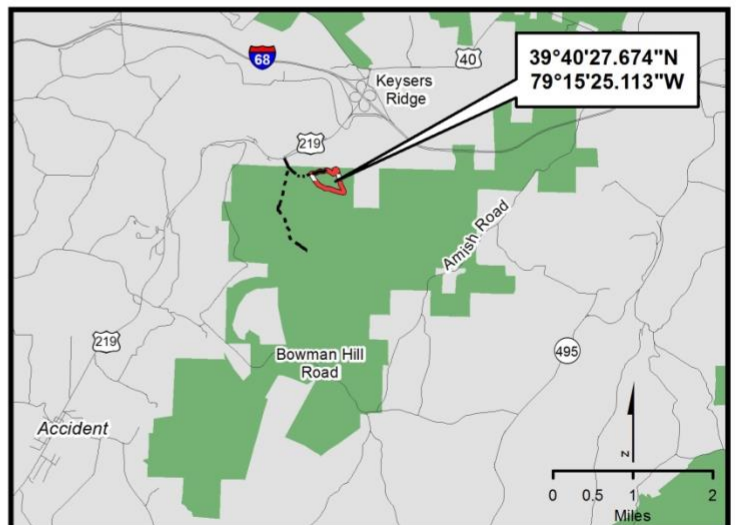
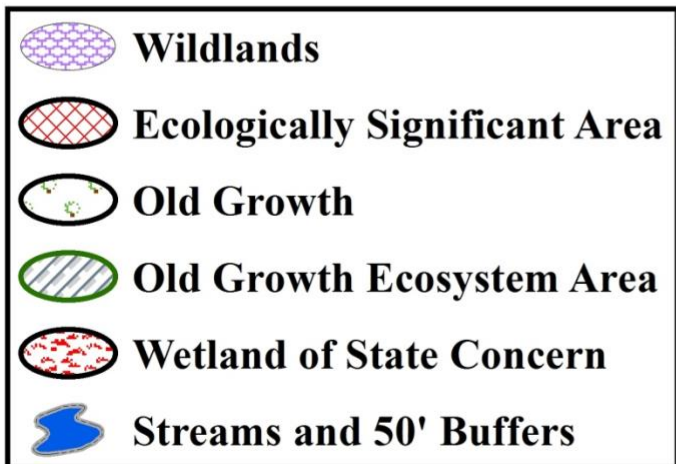
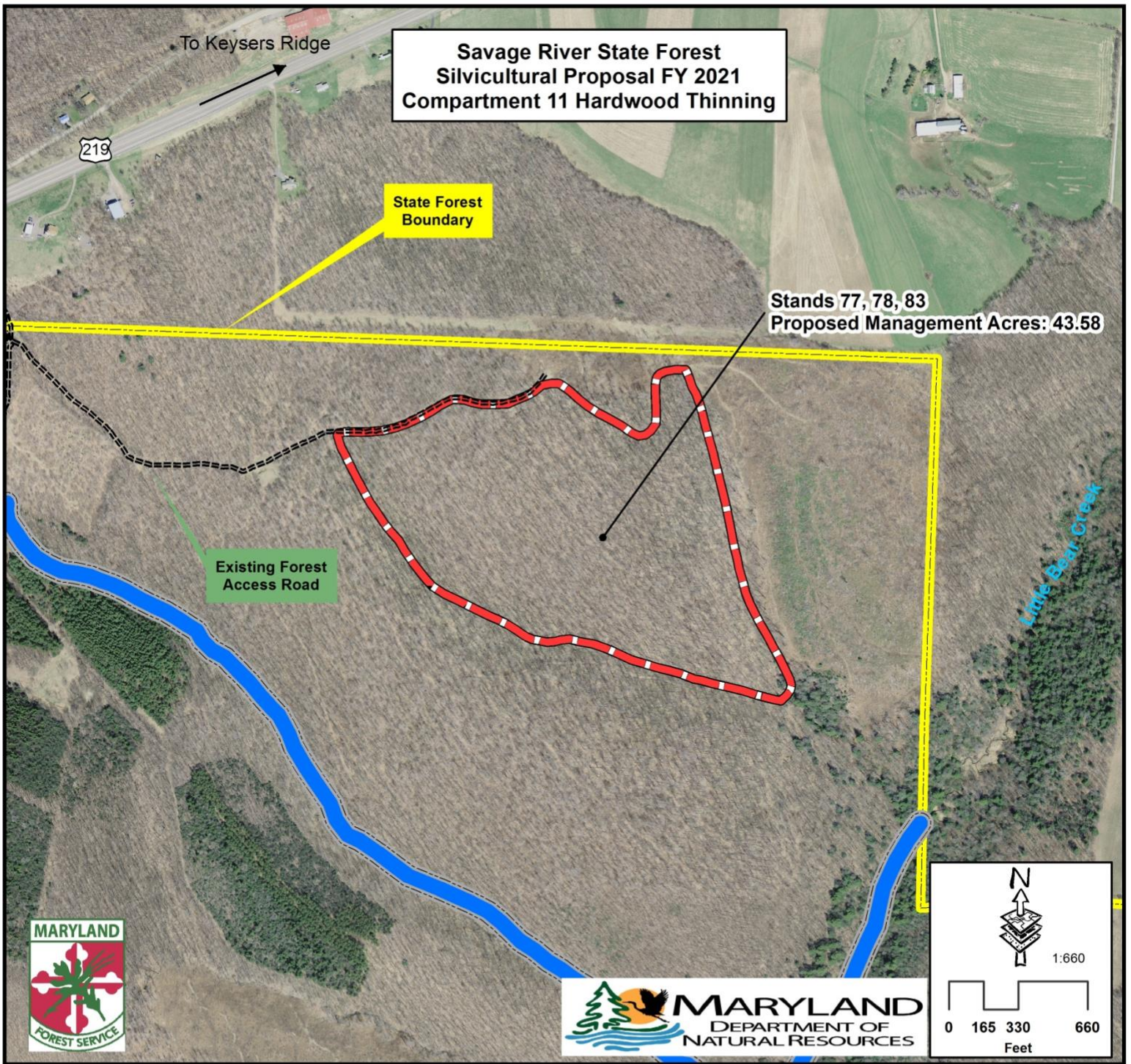
Water Resources: This stand drains south into Little Bear Creek, within the Youghiogheny River Watershed. The proposed silvicultural treatments will be outside of all HCVF and stream buffer areas. No heavy equipment will be permitted within the protective riparian buffers of any streams or associated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

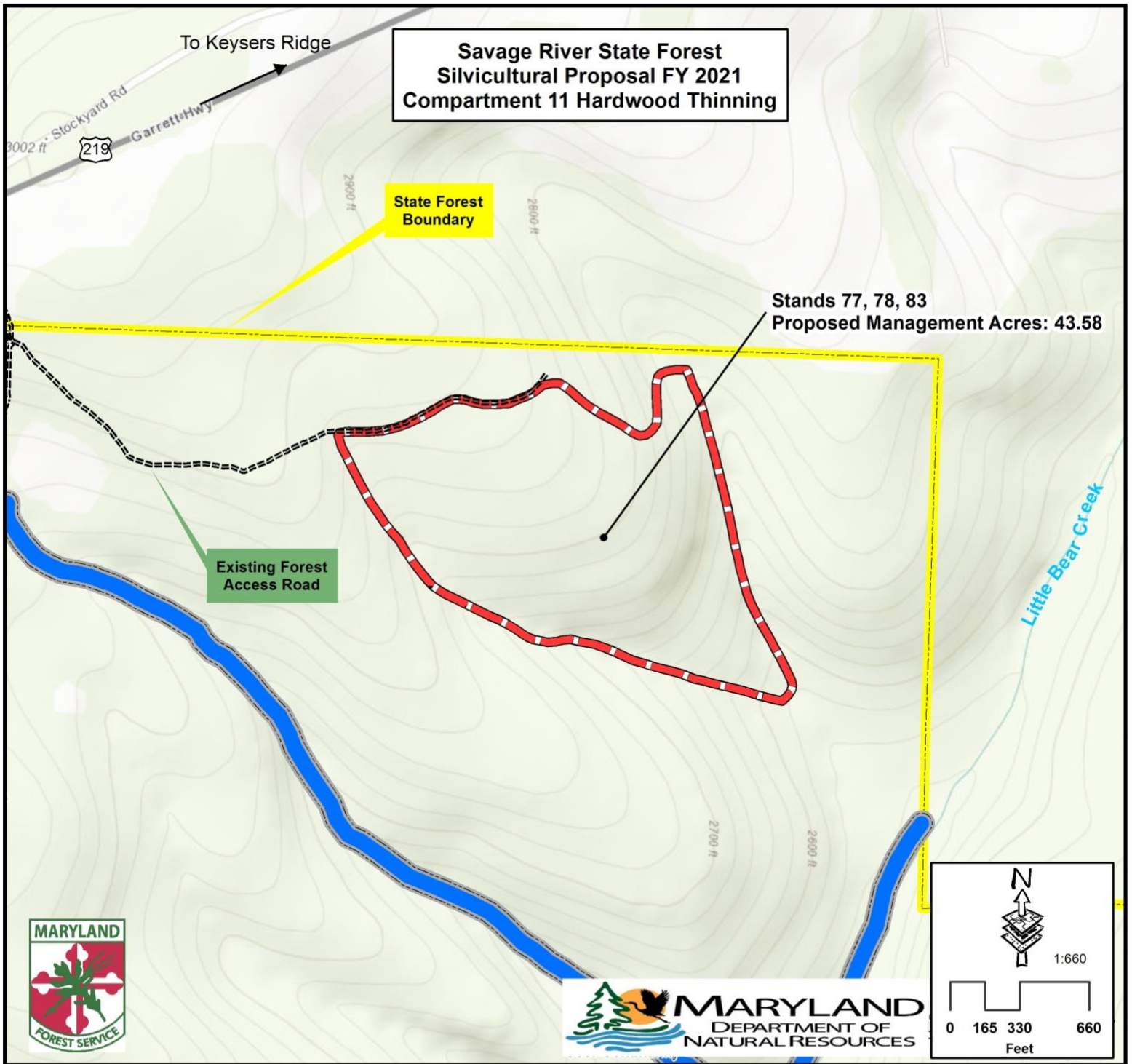
Soil Resources: The dominant soil type of the site is categorized as Cookport and Ernest very stony silt loams, 8 to 25 percent slopes (CuD). Abundant stones are found on and in the soil, mainly composed of sandstone, drainage ranges from poor to well-drained and water moves slowly through the subsoil. Equipment limitations are moderate due to the water table being close to soil surface in late winter and early spring. The site has high 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 access road for the stand is primarily utilized for hunting access. 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.

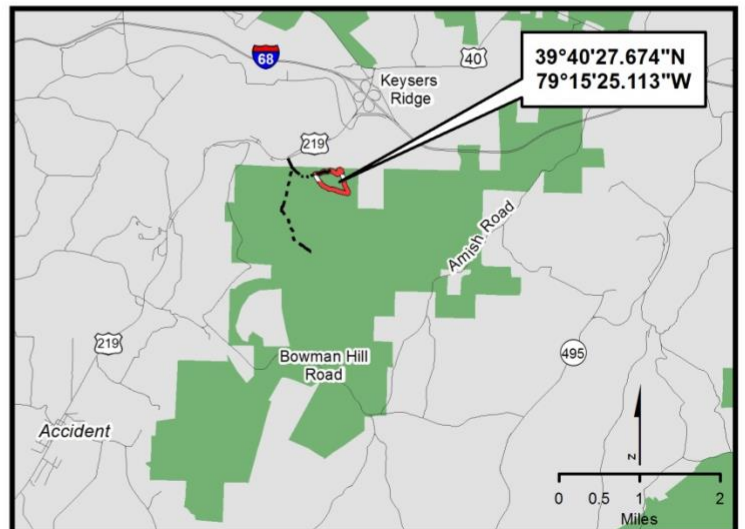
Management and Silvicultural Recommendations

This stand is nearing maturity, but desirable regeneration is not sufficient enough to warrant a regeneration harvest. Therefore, the recommended prescription for this stand is a commercial thinning. Thinning the stand will reduce the stocking levels thereby reducing competition and will provide more growing space for the higher quality trees. Removals will focus on unacceptable growing stock and the crown thinning will reduce the average basal area to 80 ft²/acre and the relative density to 60%, yielding approximately 3,500-4,000 board feet/acre. After harvest completion, the stand will be monitored for acceptable levels of desirable seedling establishment. If necessary, further silvicultural treatments including shelterwood harvests and herbicide applications may be implemented to facilitate the occupation of the site by desirable species, permitting a final harvest of the overstory to be conducted.





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



Description/Resource Impact Assessment

Location: This harvest proposal is situated on the western side of Compartment 14, in the area known as the Margraff Plantation. The site is accessible via Fratz Road, which intersects Accident-Bittinger Road approximately 0.8 miles east of the town of Accident.

Forest Community Type and Condition: This management unit is composed of an 85-year-old medium sawtimber stand with an average basal area of 147 ft² / acre and an average merchantable diameter of 15.9 inches. The overstory is dominated by northern red oak (35%), red maple (28%), black cherry (17%) and white ash (17%). This stand is overstocked with the relative density at 86% of the average maximum stocking. 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: Understory plant competition is sufficient to cause interference with regeneration efforts, with 98% of the site containing some form of significant vegetative interference. Tall woody interference occupies approximately 70% of the stand and consists primarily of black birch. Low woody interference occupies approximately 49% of site with the majority being striped maple. Interfering fern levels were found on 64% of the proposal area. Grasses cover only 13% of the management unit and do not currently pose a significant impediment to regeneration establishment. Non-native and invasive species were not found within the stands. This stand has not reached maturity and therefore, regenerating the stand is not the primary silvicultural focus and no efforts will be initiated to control the aforementioned interfering vegetation at this time.

Historic Conditions: Records indicate that no silvicultural activities have occurred within the management unit during state ownership. Several conifer stands east of the proposal were clear cut in 1997. Neither evidence of fire nor any signs of significant insect infestation or disease were observed during the inventory of the stands. The area also houses eight natural gas storage wells owned by Spectra Energy that have been in service since 1962. Pipelines from the wells crisscross the property and require specific protocols to be followed when harvesting timber over and/or around them. Spectra Energy personnel are on site for pre-harvest meetings to mark all utility lines, to ensure that all operators are aware of the potential dangers associated with the resource and to instruct them on the safest methods for extracting the wood. This particular harvest will require several gas line crossings.

Rare, Threatened and Endangered Species: No rare, threatened or endangered species have been identified on the site that would be impacted by the silvicultural prescription.

Habitats and Species of Management Concern: No habitats or species of management concern or any species that would be impacted by the silvicultural prescription were discovered during the proposal review process.

Water Resources: The stands drain west into the South Branch of Bear Creek within the Youghiogheny River Watershed. The proposed silvicultural treatments will be outside of all HC VF 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 Forest Sustainable 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 good productivity for woodland management, with a site index of 65-75 for upland oaks on south 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.

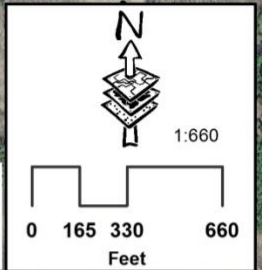
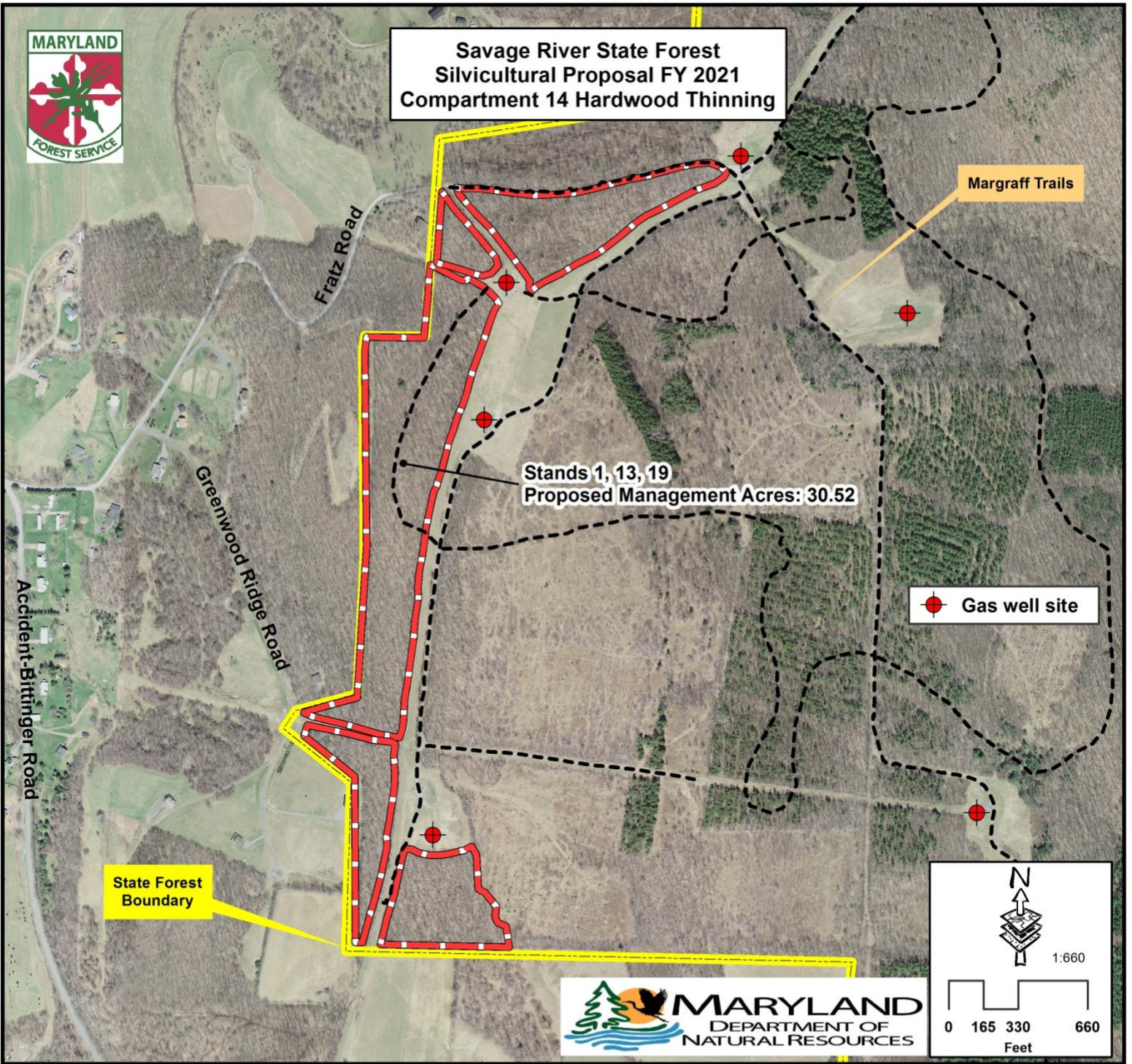
Recreational Resources: This particular area of the forest offers several recreational opportunities. First, the Margraff Plantation Bike Trail System, consisting of single-track trails, meanders for six miles throughout the compartment. Also, the main roads of the compartment serve as both snowmobile and horseback riding trails. Further, this area is a popular hunting destination, equipped with several campsites specifically designated for larger hunting parties. Fratz Road is a single lane roadway and the only means of ingress/egress for the compartment, which may lead to restricted visitor access during the harvest operations.

Management and Silvicultural Recommendations

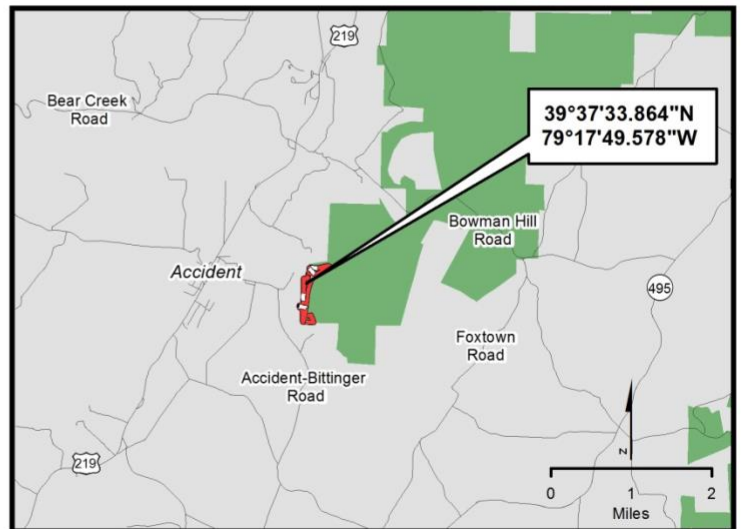
The proposed silvicultural treatment for this site is a commercial thinning given that competitive regeneration is lacking and the stand is overstocked. A crown thinning will be implemented, reducing the residual basal area to approximately 85 ft²/acre and reducing the residual relative stand density to approximately 60%. Removals will be concentrated on the unacceptable growing stock, particularly the large diameter white ash component that has been affected by emerald ash borer infestation and presents a potential safety issue along the access roads within the Margraff Plantation area. This harvest will yield approximately 3,000 – 3,500 board feet/acre. Residual trees will benefit from the improved spacing with increased vigor, growth rates and overall stand health. Retention will favor trees with superior form as well as seed sources for establishing desirable regeneration in the future stand. Post-harvest monitoring will be conducted to determine if acceptable levels of desirable regeneration have naturally established within the stand or if further silvicultural activities, including herbicide treatment of interfering vegetation, will be necessary to ensure that a desirable regeneration cohort will fully occupy the site when a final removal harvest is conducted.



Savage River State Forest
Silvicultural Proposal FY 2021
Compartment 14 Hardwood Thinning

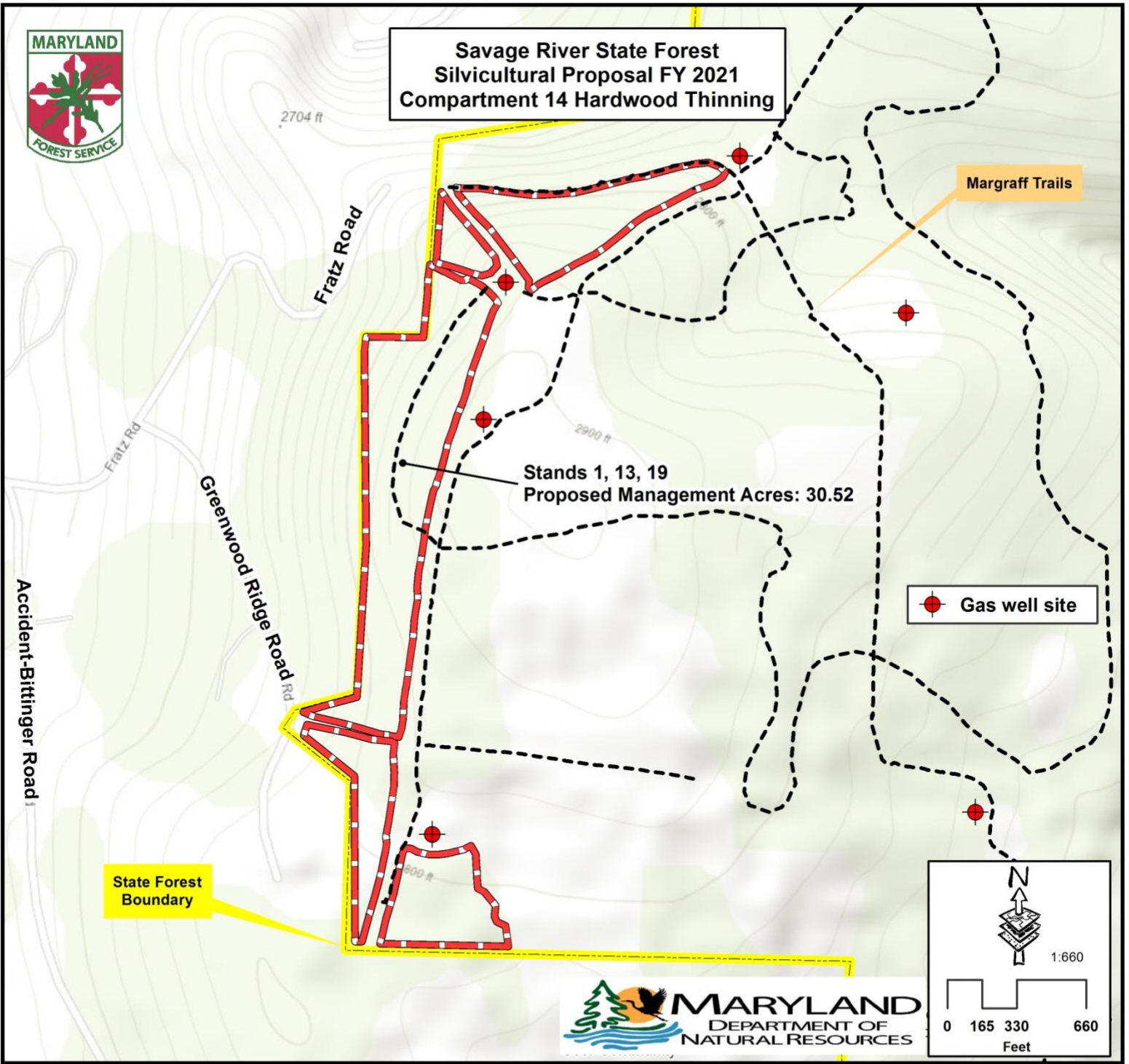


- Wildlands
- Ecologically Significant Area
- Old Growth
- Old Growth Ecosystem Area
- Wetland of State Concern
- Streams and 50' Buffers





Savage River State Forest Silvicultural Proposal FY 2021 Compartment 14 Hardwood Thinning

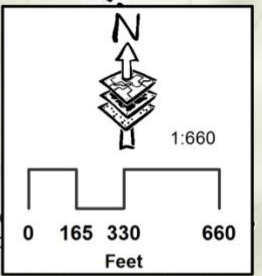


State Forest Boundary

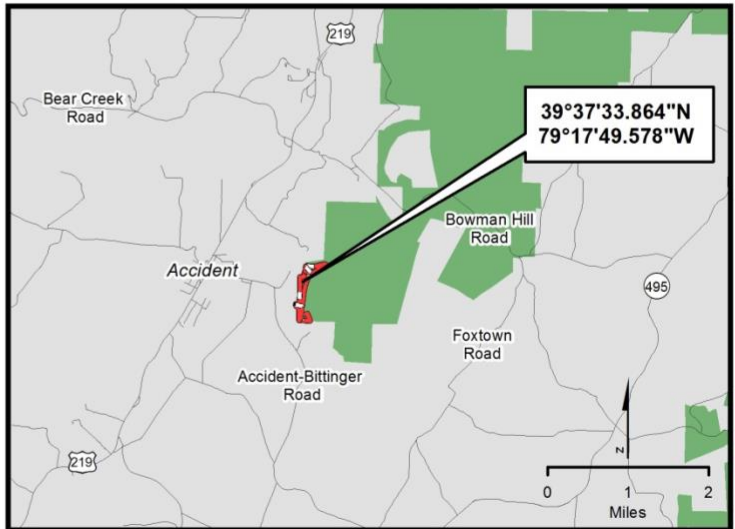
Stands 1, 13, 19
Proposed Management Acres: 30.52

Margraff Trails

Gas well site



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



Description/Resource Impact Assessment

Location: This harvest proposal is located on both sides of Fairview Road approximately 1.3 miles southeast of the intersection of Fairview Road and New Germany Road adjacent to the high tension transmission lines.

Forest Community Type and Condition: This harvest proposal is composed of three separate conifer stands that are approximately eight acres, 17 acres and 25 acres respectively. Stand I is comprised primarily of red pine (63%) interspersed with Norway spruce (7%) and white pine (3%) as well as hardwood species, including red maple (19%) and black cherry (8%). Total basal area for the stand is 207 ft²/acre with a relative density of 126% and an average merchantable diameter is 12.5 inches. Stand II contains a significant proportion of white pine (51%) as well as red pine (21%) and Norway spruce (11%) components. Minimal quantities of hardwood species, including red maple (9%) and black cherry (7%) are found within the stand. Relative density is 112% of the optimum for growth with an average basal area of 190 ft²/acre. Average merchantable diameter for the stand is 14.2 inches. The canopy of Stand III is comprised of red pine (42%), Norway spruce (19%) and larch (8%). Black cherry (15%) and red maple (9%) are also found within the canopy. The stand is overstocked at 103% relative density and an average basal area of 175 ft²/acre. The average merchantable diameter is 14.1 inches. Desirable regeneration and overall plant diversity is scarce in the understories due to the thick duff layers and the dense overcrowded canopies typical of conifer plantations.

Interfering Elements: The lack of any desirable regeneration as well interfering understory plant competition within the three stands illustrates the effects of highly overstocked conifer plantations on understory establishment and growth due to limited light resources and thick duff layers. No non-native and invasive species were identified during the stand inventory.

Historic Conditions: State Forest records show that these stands were thinned in 1967 and 1976. The conifer stand to the south was thinned in 2018 and the hardwood stand to the east was clear cut in 2011. Two harvests specifically implemented to promote quaking aspen regeneration were completed in 2013. No evidence of fire was observed within the stand. No signs of significant insect infestations or disease were observed during the assessment of the stand.

Rare, Threatened and Endangered Species: This area has a history of containing critical habitat for a State Endangered species that was first discovered in 2001 and last recorded as using the area in 2006. In cooperation with Wildlife and Heritage personnel, preferred tree species and canopy structures were identified in the adjacent conifer stand to the west and in 2018 a thinning was conducted in accordance with the accepted BMPs for the raptor. The thinning removed approximately 1/3 of the basal area and retention focused on trees of a particular species and form that created acceptable nesting strata. Any developed understory between the rows of conifers was removed to provide hunting corridors for the raptor. This proposal will serve as an extension of that work and increase available critical habitat to approximately 85 acres.

Habitats and Species of Management Concern: The conifer plantation component of the forest landscape was implemented in an effort to rehabilitate overused and misused tracts of agricultural and mine land by serving as a nurse crop that would foster the reestablishment of native species and would subsequently be harvested in its entirety. Forest management priorities have not adhered to this strategy allowing the conifer stands to reach maturity and in the process, creating a unique habitat niche for a suite of species. However, in the absence of any silvicultural work being implemented, the planted conifer stands persist in a severely overstocked condition, some to the point of stagnation and decline. In an ongoing effort to maintain the conifer component of the forest, commercial thinnings will be implemented in order to reduce high stocking densities leading to increased health, vigor and growth in residual stands. Where appropriate, final harvests will be applied to stands in accelerated states of decline followed by occupation of the site by native hardwoods or artificial regeneration with suitable species.

Water Resources: Stands I and II drain north into an unnamed tributary of Poplar Lick Run and Stand III drains south into Miller Run and flows into Big Run, all of which are 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 Forest Sustainable Management Plan.

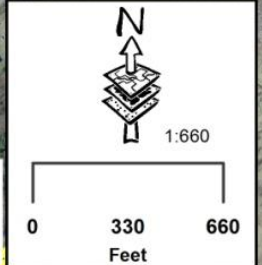
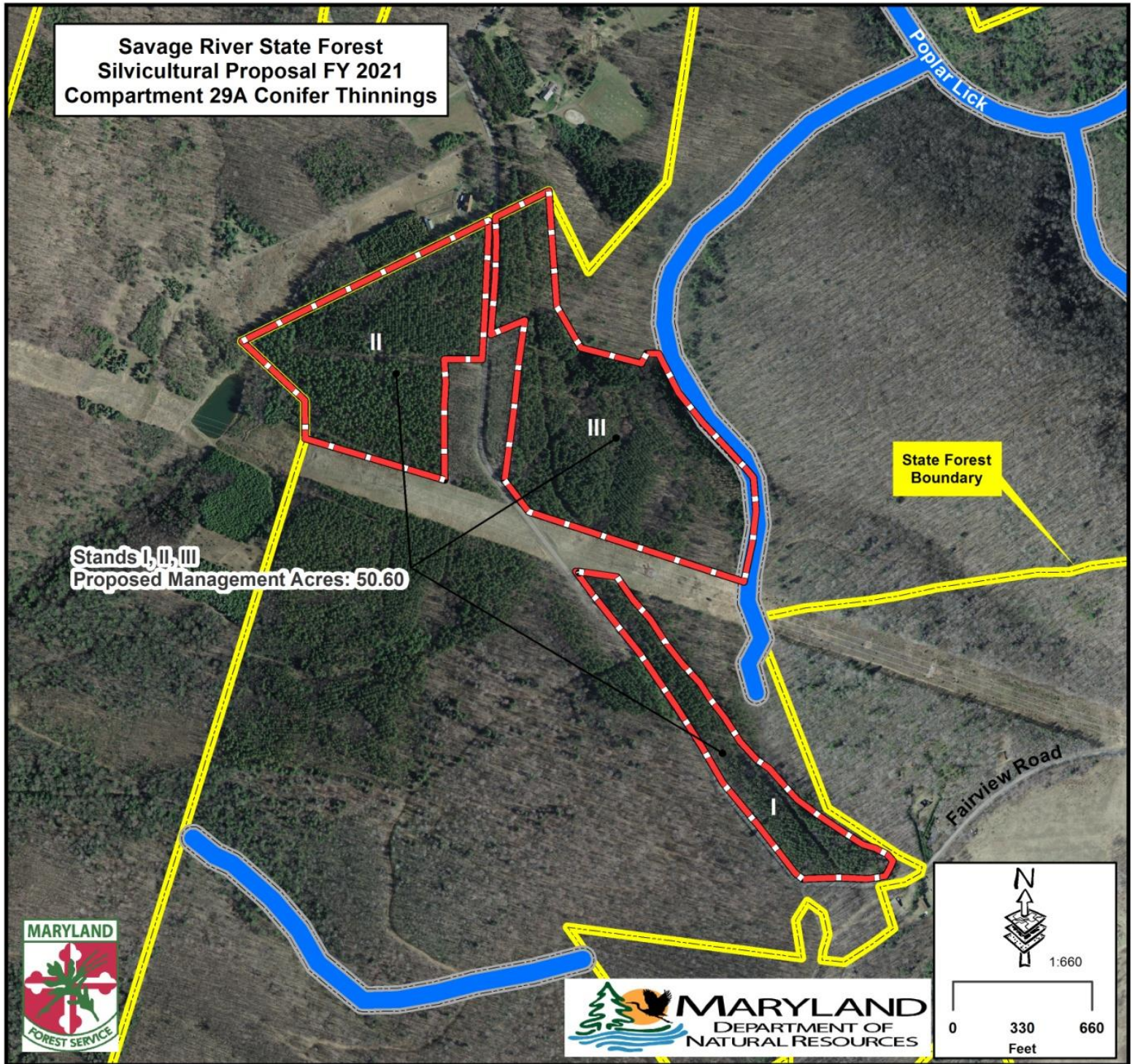
Soil Resources: Dominant underlying soils are mapped as Ungers, Calvin and Lehew channery loams, 0 to 10 percent slopes (UcB). This soil is moderately deep over bedrock and well drained. Equipment limitations are slight as the soil type is classified as not highly erodible land and is considered to be of statewide importance as farmland. The site has good productivity for woodland management with a site index range 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: No developed recreational resources are found within these areas. Hunting is the primary recreation activity in this part of the forest and opportunities to hunt the area may be limited or disrupted for the duration of the timber harvest.

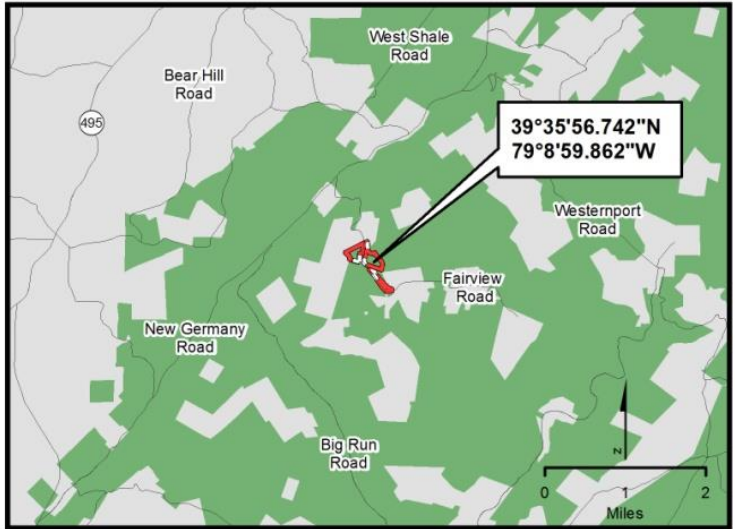
Management and Silvicultural Recommendations

Due to the overstocked condition of all three stands, the planned silvicultural treatment for each site is a commercial thinning. The objective of the thinning is two-fold; first, to reduce stocking levels in order to reduce competition among the remaining trees, to increase the health, vigor and growth rate of the residual stand and second, to maintain this important conifer stand on the landscape to serve as critical habitat for a State Endangered species. The thinnings will be carried out as a crown thinnings, involving the removal of approximately 1/3 of the basal area of each stand. Retention will focus on habitat enhancement for the endangered raptor, targeting preferred trees species and canopy structure. Advanced hardwood regeneration between rows will be removed to facilitate hunting opportunities for the birds of prey. Harvest yields will range from 3,500 board feet/acre in Stand I to 5,200 board feet/acre in Stands II and III.

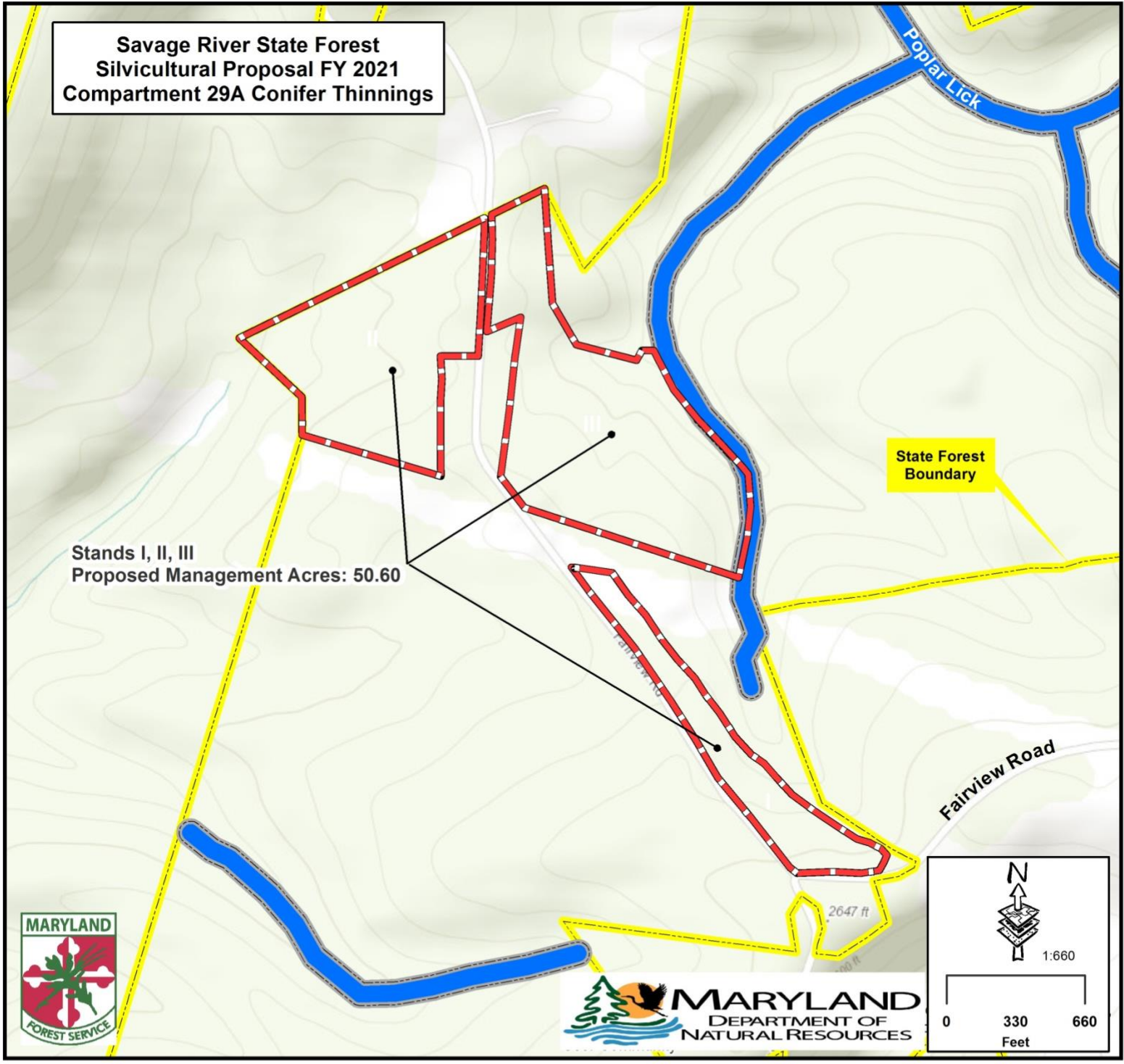
**Savage River State Forest
Silvicultural Proposal FY 2021
Compartment 29A Conifer Thinnings**



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



**Savage River State Forest
Silvicultural Proposal FY 2021
Compartment 29A Conifer Thinnings**

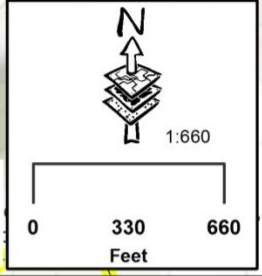








Stands I, II, III
Proposed Management Acres: 50.60

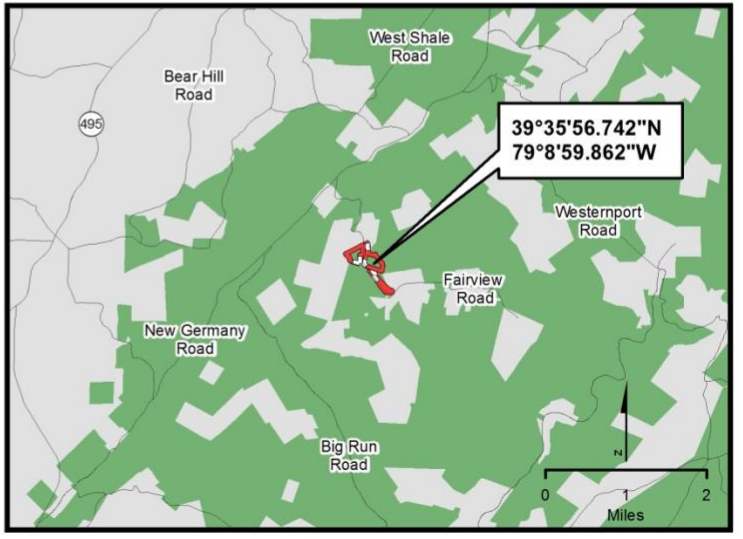
State Forest
Boundary

Fairview Road

2647 ft



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



Description/Resource Impact Assessment

Location: This harvest proposal is accessible off the St. Johns Rock ORV Trail via an existing forest access located approximately 3.1 miles north of the trail intersection with Avilton-Lonaconing Road.

Forest Community Type and Condition: This 187-acre management unit consists of two distinct harvest units; a 133.6-acre medium sawtimber stand (Unit 1) and a 54.8-acre large sawtimber stand (Unit 2). Unit one contains a medium sawtimber mixed oak stand that is approximately 85 years old with an average merchantable diameter of 16.0 inches and an estimated standing growing stock of 10,700 board feet/acre. The main overstory is composed of northern red oak (41%), red maple (32%) and black birch (7%). The stand is overstocked at 80% relative density with an average basal area of 134 ft²/acre. Unit 2 is approximately 101 years old with an average merchantable diameter of 17.6 inches and an average basal area of 127 ft²/acre. The stand is composed of northern red oak (33%), sugar maple (23%) and red maple (20%) and is overstocked at 83% relative density. Oak regeneration was found on 2% of inventory area of Unit 1 and none was recorded for Unit 2. Desirable saplings comprised the majority of regeneration found within both stands, with 11% stocked plots in Unit 1 and 44% in Unit 2. Desirable regeneration present in both units is lacking, in part due to the presence of the interfering elements explained in the following section.

Interfering Elements: The entire management area contains some form of interfering vegetation. Tall woody interference is problematic in each unit, with 85% of Unit 1 and 69% of Unit 2 occupied by undesirable vegetation primarily composed of witch hazel and black birch. Low woody interference occupies 56% and 63% of the units respectively and populations of problematic ferns and grasses are not significant enough to interfere with regeneration efforts. Stand regeneration is not the primary silvicultural focus for the stand and no effort will be made to control the aforementioned interfering vegetation at this time.

In addition to interfering vegetation, the presence of white-tailed deer can have a negative influence on regeneration success. 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 sites 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 records indicate that Unit 1 was thinned in 1991. The stand immediately to the north of the proposal was thinned in 2015. No management activities have been conducted in Unit 2 during state ownership. No evidence of fire, insect pest activity or forest diseases was observed in the harvest proposal area.

Rare, Threatened and Endangered Species: No rare, threatened or endangered species have been found on the site that would be impacted by the silvicultural prescription.

Habitats and Species of Management Concern: No habitats or species of management concern or any species that would be impacted by the silvicultural prescription were discovered during the proposal review process.

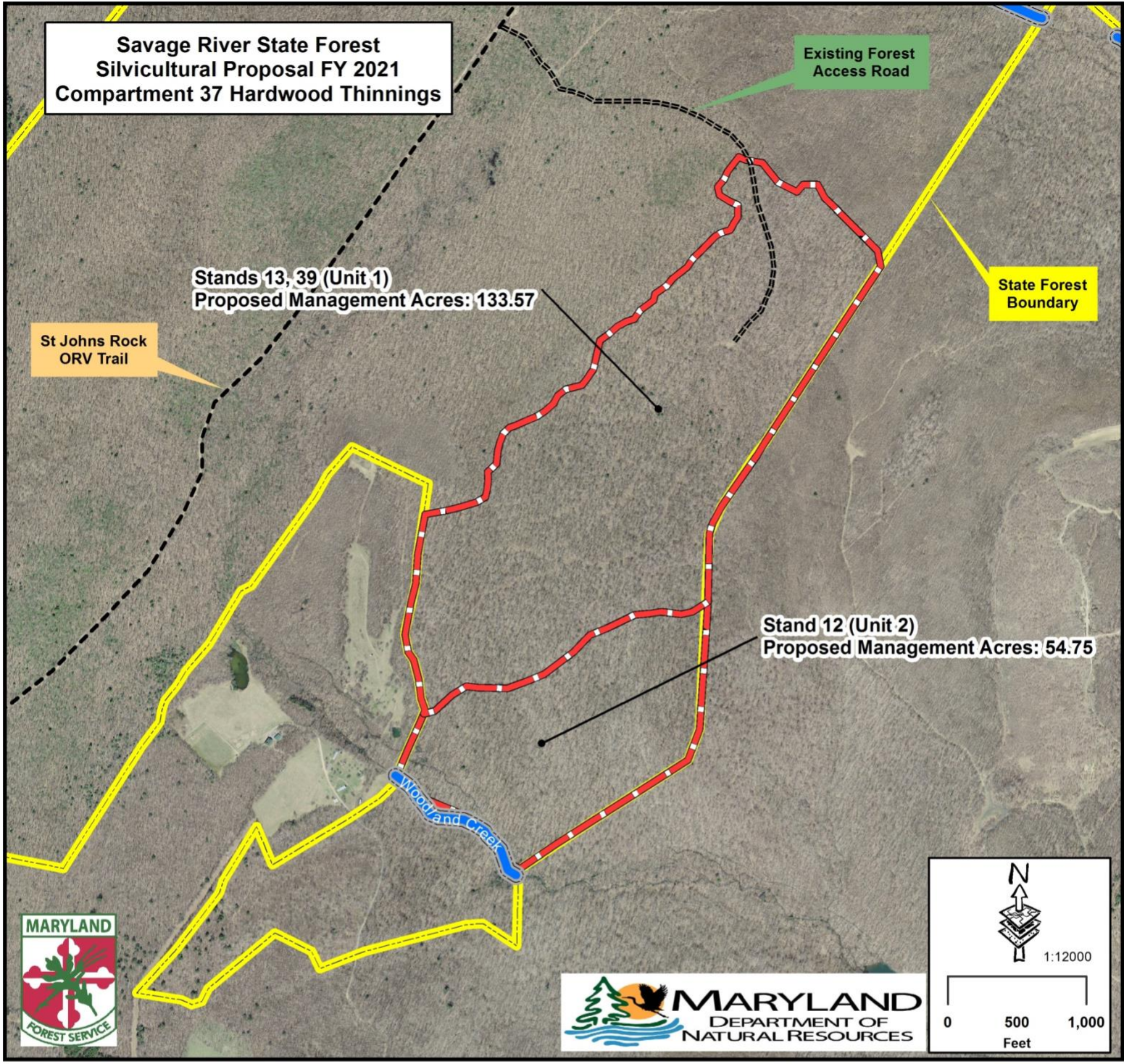
Water Resources: The northern end of the management unit drains north into Staub Run and the southern portion drains into Woodland Creek, both within the George's Creek Watershed. The proposed silvicultural treatments will be outside of all HCWF stream buffers and designated wetland areas. No heavy equipment 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 harvest site is underlain with soils designated as Dekalb and Gilpin very stony loams, 15 to 25 percent slopes (DgD). This soil is moderately deep and well drained. Equipment limitations are slight to moderate and erosion hazard is moderate on steeper slopes. 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.

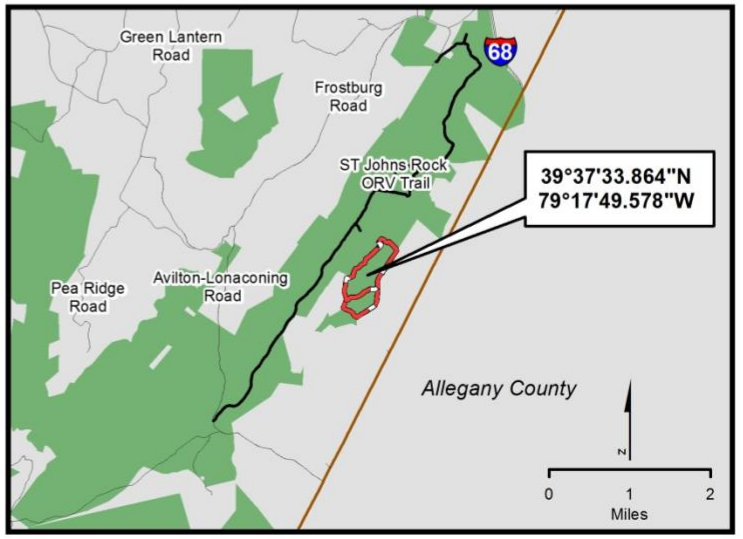
Recreation Resources: The forest access road that will be utilized as a haul road for the timber harvest serves as the southern portion of the St Johns Rock ORV Trail. Use of the trail may be interrupted for the duration of the logging operation. Hunting is also a popular activity in this area as the 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.

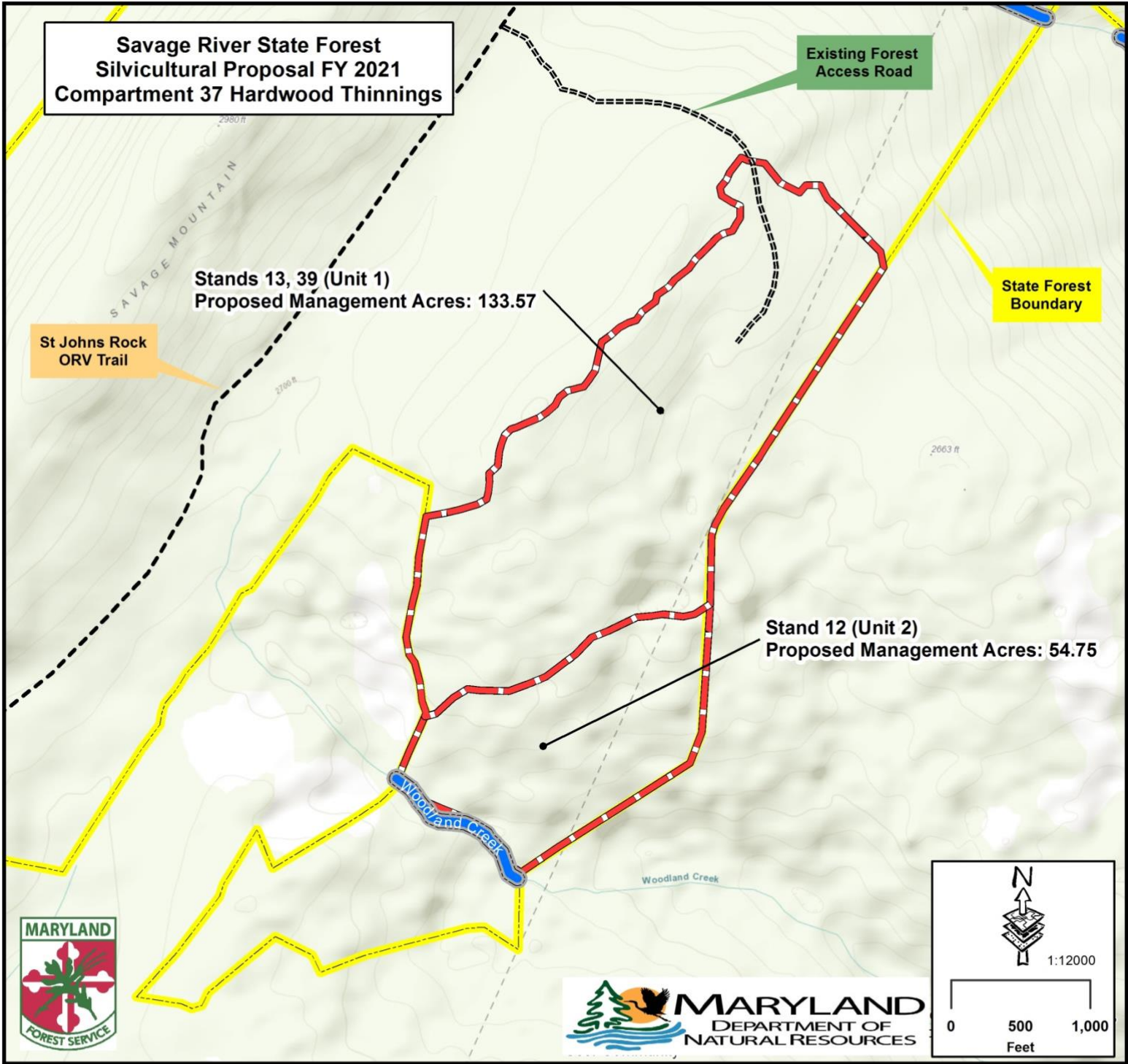
Management and Silvicultural Recommendations







The planned silvicultural treatment for both units is a commercial thinning. The thinning that was conducted in Unit 1 left adequate stocking in the residual stand to allow for a second thinning harvest and no recorded management has taken place in Unit 2. Levels of acceptable regeneration are lacking within both units. The objective of the thinnings is to reduce stocking levels in order to lessen competition among the remaining trees thereby, increasing the health, vigor and growth rate of the residual stands. The canopy gaps created by the thinnings will provide more light to the forest floor and aid in the establishment of desirable regeneration. The thinnings will be carried out as a crown thinning; reducing the basal area of Unit 1 to approximately 80 ft²/acre and relative density to 62%. Unit 2 will be cut to 100 ft²/acre with a relative density of 60%. This will essentially serve as a shelterwood seed cut aiding in the establishment of advanced seedlings. Unacceptable growing stock will be the primary focus of removals along with select individual stems that have reached maturity. Retention in both units will favor trees with superior form and seed sources for developing regeneration in the future stand. The harvest will yield approximately 3,000 board feet/acre in Unit 1 and 3,200 board feet/acre in Unit 2. After harvest completion, the stands will be monitored for acceptable levels of desirable seedling establishment. If necessary, further silvicultural treatments, including shelterwood harvests and herbicide applications may be implemented to facilitate the occupation of the site by desirable species, permitting a final harvest of the overstory to be conducted.

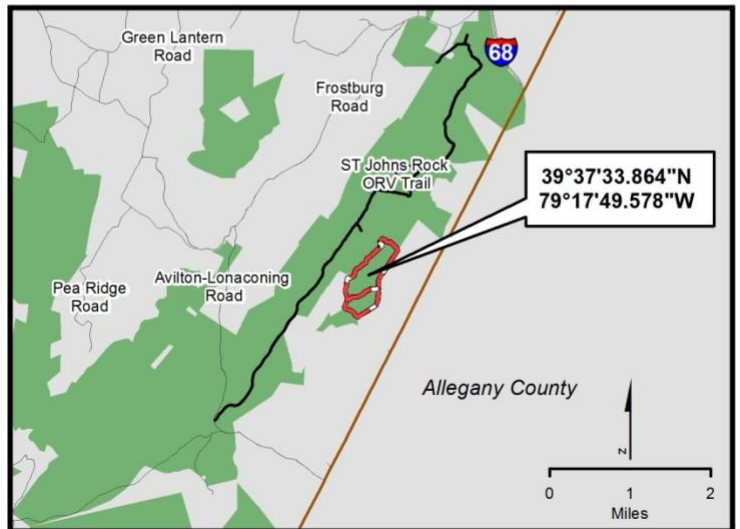


-  **Wildlands**
-  **Ecologically Significant Area**
-  **Old Growth**
-  **Old Growth Ecosystem Area**
-  **Wetland of State Concern**
-  **Streams and 50' Buffers**





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



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 \$646,235.00. Of that amount, \$383,018.00 goes to fund classified salaries and benefits for four employees; \$92,597.00 funds four contractual employees and \$170,620.00 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-2119.

B. SRSF Funding Sources: Estimated - \$557,926

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 July 1st, the first day of the fiscal year. 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.

Another source of funding for the state forest is Recreational Trail Grants. These grants are competitive and are generally limited to \$80,000 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 13-mile long St. John's Rock ORV Trail.

C. Operational Cost: Estimated Annual Expenses - \$557,926

Operational expenses are those costs paid directly out of the Savage River State Forest operational budget. 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-2120 budget proposal was prepared in August of 2018.

- *Classified Salaries, Wages and Benefits: \$315,985*

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: \$92,597*

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: \$149,344*

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.

D. 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: St. John's Rock ORV Trail Usage Totals for Year 1 and 2: July 23, 2017 to July 23, 2018 and July 23, 2018 to July 1, 2019.

Year	Reservations	Daily Users	Camping	Revenue*
FY 2018	193	314	31	\$4031.00
FY 2019	158	264	16	\$3315.00

**Figures are gross amounts and do not factor employee wages.*

	FY 2018	FY 2019
Average Daily Use (People/day)	0.86	0.77
Average Daily Revenue (\$/Day)	\$11.04	\$9.69
Average Camping #s (Reservations/day)	.08	.05

Appendix 2: Yellow Archangel Management Plan

*Savage River State Forest Non-Native Invasive Plant Management: Yellow Archangel (*Lamiastrum 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 (*Lamiastrum 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 Invasive Species Management Map, p.20).

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, weather permitting, until the spread of the plant is contained or the plant is eradicated. Site monitoring will continue after the eradication of the plant for at least 5 years.

Treatment:

Ideal herbicide 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 in recent 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' in length and 75' in width using a glyphosate based herbicide. All herbicide applications are conducted by registered employees working under the license of a certified applicator (Permit No. 30914-77618; Categories 2 and 6). The next treatment is scheduled for late March to early April of 2019 depending on weather conditions.

Treatment Schedule	
Monitoring	Chemical
April – September (Annually)	Early March to April (Annually)

Appendix 3: Japanese Knotweed Management Plan

*Savage River State Forest Invasive Plant Management: Japanese Knotweed (*Fallopia japonica*)*

Description:

Several areas of Savage River State Forest have become infested with the invasive plant Japanese knotweed (*Fallopia japonica*). The number of treatment areas that have been delineated (See Invasive Species Management Map, p.19) continues to grow and those of manageable size 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 near 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.

Japanese knotweed is a fast-growing, herbaceous, rhizomatous perennial that forms dense patches and shades out all nearly all 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 identified 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. Treatment of these two areas has been repeated on a yearly basis and other areas of infestation that are considered manageable are added to the treatment regime as they are discovered.

Several new areas have been added to the management plan including three patches adjacent to Route 495, just north of the intersection with New Germany Road, two patches located on Westernport and Aaron's Run Road, just south of the High Rock Tower, one small patch adjacent to the Handicapped Hunter Road on West Shale Road and a large occurrence along New Germany Road located approximately one mile north of the state forest headquarters. Product application is/was conducted by registered employees working under the license of a certified applicator permit (Permit No. 30914-77618; Categories 2 and 6). The next scheduled mechanical treatment will occur June 1, 2019 followed by the herbicide treatment on July 27, 2019.

Treatment Schedule		
Monitoring	Mechanical	Chemical
March – June 2018	June 1, 2018	July 27, 2018
March – June 2018	June 1, 2019	July 27, 2019
March – June 2019	June 1, 2020*	July 27, 2020*
March – June 2020	June 1, 2021*	July 27, 2021*
March – June 2021	June 1, 2022*	July 27, 2022*
March – June 2022	As needed	As needed

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

Appendix 4: 10-Year Timber Harvest Summary Table

<i>Fiscal Year</i>	<i>Planned Harvest</i>	<i>Bd. Ft. Vol. Harvested</i>	<i>Gross value</i>
2010	1,200,000 BD FT	1,244,076	\$241,781.00
2011	750,000 BD FT	850,561	\$176,000.00
2012	382,000 BD FT	144,349	\$26,834.50
2013	488,000 BD FT	863,049	\$161,910.00
2014	1,020,000 BD FT	521,526	\$72,689.77
2015	1,020,000 BD FT	1,286,994	\$275,126.44
2016	1,000,000 BD FT	941,285	\$225,796.59
2017	1,200,000 BD FT	853,347	\$248,487.50
2018	1,200,000 BD FT	1,152,074	\$205,100.00
2019	1,200,000 BD FT	1,406,680	\$401,481.00

Appendix 5: 2019 FSC Audit Action Plan
Maryland Department of Natural Resources Forest Service
Forest Stewardship Council Audit 2019



2019.01 – Observation

FSC Indicator: 7.2.a

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

Although the Chesapeake / Pocomoke Forest Citizens Advisory Committee member has been recently established, there is an opportunity to continue efforts to seek input from indigenous people, including all MD State Forest regions, as the last formal outreach efforts were completed 5-6 years ago. The ecologist representative position on the Forest Citizens Advisory Committee recently became vacant. At the time of the audit the ecologist position remained open. This position represents conservation science representation.

Corrective Action Request (or Observation)

The forest owner or manager last had formal consultation with tribal representatives in identifying sites of current or traditional cultural, archeological, economic or religious significance approximately 5-6 years ago. Per interview, there is not a regularly scheduled interval to re-evaluate the MD DNR SF outreach efforts. There is an opportunity to continue efforts and seek input from indigenous people, including all MD State Forest regions.

Issue – Indigenous People Outreach

2019.02 – Observation

FSC Indicator: FSC FM US 6.3.e

Non-Conformity (or Background / Justification in the case of an Observation)

The current seed mix used for landings and roads has been previously chosen for its ability to quickly germinate and establish, however the mix used has been previously approved by state wildlife staff for food plots and elsewhere at the state level for erosion and sediment control plan process.

Corrective Action Request (or Observation)

While the seed mix used on landings and roads has been previously approved by state wildlife staff for food plots and elsewhere at the state level for the erosion and sediment control plan, there is an opportunity to improve the seed mixture species and ratios to include other native species. The current mix being applied on landings and roads is comprised of only non-native naturalized species.

Issue – Site Seed Mix

2019.03 – Minor CAR

FSC Indicator: FSC FM US 6.6.e

Non-Conformity (or Background / Justification in the case of an Observation)

Power Line ROWs over the state forest system are typically maintained by the power companies who do apply pesticides as a regular management activity. These areas have not been excised from the FMU and so management activities such as pesticide use must be reported. The quantity of pesticides used is not currently being reported to the MD DNR for these ROW areas.

Corrective Action Request (or Observation)

Reporting the volumes of pesticide use on power lines by the power companies is not currently being completed.

Issue – Pesticide Reporting

2019.04 – Minor CAR

FSC Indicator: 6.7.c

Hazardous materials and fuels are stored in leak-proof containers in designated storage areas that are outside of riparian management zones and away from other ecological sensitive features until they are used or transported to an approved off-site location for disposal. There is no evidence of persistent fluid leaks from equipment or of recent groundwater or surface water contamination.

Non-Conformity (or Background / Justification in the case of an Observation)

Dozer was leaking on the site to soil below the equipment. Some oil was observed on the soil below the skidder. Logger was not on site at the time of inspection. No apparent safety equipment (fire extinguishers or spill kits) observed on any of the 3 pieces of equipment on the site. Later interview stated that the fire extinguishers were behind the seats of the skidder and harvester (out of view). Recent BMP inspection conducted by forester with no issues.

Corrective Action Request (or Observation)

There is evidence of fluid leaks from the equipment. While this did not contaminate groundwater or surface water, these leaks from equipment on unattended machinery need to be corrected in order to prevent future issues.

Issue – Fluid Leaks from Equipment

2019.05 – Observation

FSC Indicator: 8.1.a

Non-Conformity (or Background / Justification in the case of an Observation)

The organization currently conducts BMP monitoring with checklists. Different BMP monitoring checklists are used in the Eastern Shore area and on the western state forests. One form uses an evaluation system with a ranking 1-5 (1=poor, 5=excellent) while the other form uses a “Yes/No/NA” system to evaluate the harvest operation.

Corrective Action Request (or Observation)

FME is using written BMP checklists for monitoring BMP effectiveness. Two separate forms are used with one noting BMP compliance with a rating of 1-5. Per interview and document review, the ranking criteria is not clearly defined. FME could review the difference in criteria used in each region in efforts to help improve consistency for BMP monitoring effectiveness.

Issue – BMP Monitoring Checklist

Appendix 6: 2019 SFI Audit Action Plan
Maryland Department of Natural Resources Forest Service
Sustainable Forestry Initiative Audit 2019



Minor Nonconformance

SFI 11.1.4: Contractor education and training sufficient to their roles and responsibilities

Minor: This process is not fully effective

Evidence: Contract logger is a Maryland Master Logger but has issues with equipment leaking on site. Dozer was persistently leaking fluid onto soil beneath and some fluid was observed below the skidder. Logger was not on site, but no apparent safety equipment (fire extinguishers and spill kits) were observed on any of the 3 machines. A later interview stated that the fire extinguishers were behind the seats of the skidder and harvester (out of view). Recent BMP inspections completed by forester noted no issues.

Issue – Fuel Leaks and Safety Equipment

Opportunity for Improvement

SFI 2.1.1: Documented reforestation plans, including designation of all harvest areas for either natural, planted or direct seeded regeneration prompt reforestation, unless delayed for site-specific environmental or forest health considerations or legal requirements, through planting within two years or two planting seasons, or by planned natural regeneration methods within five years.

OFI: Regeneration criteria are forest-type specific. Confirmed that western state forests use Oak-Silvah for criteria and protocols for regeneration surveys. No regeneration delays were observed in the field. Although planting is rarely done, there is an opportunity for improvement in the regeneration criteria in order to achieve acceptable species and stocking levels for naturally regenerating stands in the eastern region

Issue: Regeneration Criteria

Opportunity for Improvement

SFI 2.2.5: Use of pesticides banned under the Stockholm convention and persistent organic pollutants

OFI: Although pesticides are currently checked against the FSC checklist, there is an opportunity to improve the chemical review process (both internally and with contractors) to ensure that current and future uses of pesticides banned under the Stockholm convention and persistent organic pollutants are not being used.

Issue: Pesticide Use Reporting

Opportunity for Improvement

SFI 3.1.3: Monitoring of overall best management practices implementation

OFI: The organization currently conducts BMP monitoring with written checklists. Different checklists are used on the eastern shore than those used on the western state forests. There is an opportunity to improve the criteria used to evaluate BMP monitoring and create some conformity between the regions

Issue: BMP Checklist Criteria

Opportunity for Improvement

SFI 8.2.1: Program participants with forest management responsibilities on public lands shall confer with affected indigenous peoples with respect to sustainable forest management practices.

- a. Understand and respect traditional forest-related knowledge***
- b. Identify and protect spiritually, historically, or culturally important sites***
- c. Address the use non-timber forest products of value to indigenous peoples in areas where program participants have management responsibilities on public lands***
- d. Respond to indigenous peoples inquiries and concerns***

OFI: Although the Chesapeake / Pocomoke Forest Citizens Advisory Committee member has recently been established, there is an opportunity to continue efforts and seek input from indigenous people. The last formal outreach was completed 5-6 years ago and there is no regularly scheduled interval to re-evaluate the MD DNR SF outreach efforts.

Issue: Indigenous Peoples Outreach

Opportunity for Improvement

SFI 11.1.2: Assignment and understanding of roles and responsibilities for achieving SFI 2015-2019 Forest Management Standard objectives.

OFI: There is an opportunity to improve the assignment and understanding of roles and responsibilities as it relates to contract requirements (per review of the Stone Mountain Road contract #0217). Internal contractual documents were incomplete on one page of the contract. Per interview with multiple DNR staff, there were differing thought as to who was responsible for noting the official date and signature on the contract.

Issue: Contract Coordination

Opportunity for Improvement

SFI 11.1.3: Staff education and training sufficient to their roles and responsibilities

OFI: While the seed mix used on landings and roads has been previously approved by state wildlife staff for food plots and erosion control; there is an opportunity to improve staff education and training as it relates to the seed mixture (species and ratios) currently being used on landings and roads.

Issue: Site Seed Mix

Opportunity for Improvement

SFI 15.1.2: System for collecting, reviewing and reporting information to management regarding progress in achieving SFI 2015-2019 Forest Management Standard objectives and performance measures.

OFI: Currently the document “Internal Review ISA-FIELD-CHECKLIST-ALL-SF” is used. There is an opportunity to consider using other foresters from different regions to help strengthen and improve current auditing processes.

Issue: Internal Silvicultural Audit Integration

Appendix 7: Interdisciplinary Team Review and Comments

Maryland Department of Natural Resources State Forests

Savage River State Forest
FY-21 Annual Work Plan
ID Team Review
Scheduled for Thursday, September 26, 2019



ID Team Members: Paul Busam (MDE), Scott Boylan (MDE), Alan Klotz (Fisheries), Sean Nolan (SRSF), Erin Thomas (Parks), Dan Feller (WHS), George Eberling (MFS), Rick Latshaw (Wildlife), Mike Friend (NRP), Jack Perdue (MFS)

Attendance: Sean Nolan (SRSF), Mike Johnson (SRSF), George Eberling (MFS), Jack Perdue (MFS), Rick Latshaw (Wildlife), Jody Johnson (Fisheries).

Overview / Discussion of FY 2021 Work Plan:

No requests for site visits were submitted by the ID Team for any of the silvicultural proposals, however a few comments and questions were received:

Heritage:

General Comment – *asked that the initial silvicultural maps be more detailed and include probable buffer areas, landing locations, initial basal area, target basal area, etc.*

Collier Place East – *made note of a steep area along the southern boundary of the proposed timber sale area.*

Collier Place Powerline – *made note that the proposed sale area borders the Bear Creek ESA which is known to provide habitat for a state rare dragonfly (Southern Pygmy Clubtail). Inquired about buffering the ESA boundary when laying out the timber sale.*

Fairview Pine – *Forwarded information to Dave Brinker for Goshawk habitat evaluation and comment.*

Klondike – *made note that the sale borders on Woodland Creek and inquired about buffer distance on Woodland Creek.*

Wildlife:

Klondike – *made note that a known population of Golden-winged Warblers has been recorded in the same general area on private property. Inquired about possibly including some patch cuts within this large sale block to favor Golden-winged Warbler habitat.*

Appendix 8: Citizens Advisory Committee Review and Comments



Maryland Department of Natural Resources State Forests

Savage River State Forest
FY-21 Annual Work Plan
Citizen's Advisory Committee
Scheduled for

Advisory Committee Members: Mark Diehl, Kevin Dodge, Mike Dreisbach, Steve Green, Rusty Leonard, Michael Minnick, Jim Minogue

Attendance: Sean Nolan (SRSF), Mike Johnson (SRSF), George Eberling (MFS) and all advisory committee member were present at the meeting.

Overview / Discussion of FY 2021 Work Plan:

Annual citizen's advisory committee meeting was called to order at 6:00PM at the Savage River State Forest Office. During the first hour of the meeting we discussed current projects on the state forest and status / usage of our recreational facilities. All projects currently active on the forest were accepted as described. A couple comments were made regarding recreational facilities and usage:

- Possibly increasing the cost of the annual shooting range permit
 - o The shooting range is on schedule for critical maintenance in the near future and we will assess the possibility of increasing the permit fees at that time.
- Usage of the St. John's Rock ORV Trail
 - o Use of the trail continues to be low and the committee expressed concern that some additional marketing may help to increase user numbers. The idea of putting an add in the Hunting & Trapping Digest along with the Freshwater Fishing Guides was discussed and favorable to all.
- Condition of the Dry Run Boat Ramp
 - o People continue to get stuck at the boat ramp when the water levels are drawn down. Possibly reach out to Upper Potomac River Commission along with Fisheries Service to see if there is anything that can be done.

The second hour of the meeting presented an overview of the six silvicultural proposals associated with the 2021 work plan. All proposals were discussed and approved by the committee with little comment:

- Verso, Luke Papermill Closure
 - o With the closure of the papermill it was discussed that markets for low value and pulpwood size material are extremely tight at the current time and will likely remain that way until some new outlets become present for that type of material. It has become rather difficult to sell marginal timber as the contractors simply don't have outlets for low value wood.
- Timber Prices
 - o Given the current export and tariff situation, the lucrative market for exporting sawlogs has greatly diminished and driven down prices for key species (red

oak, black cherry and white ash). The domestic market for “dark” species such as red oak and cherry is also unfavorable at the current time, so we are trying to target sale areas heavier to maple and other “light” colored species. It was discussed that we may try to implement work plans with a longer time frame (5 years) so that we can attempt to capitalize on market conditions by having a larger pool of sales approved and ready to implement when the markets change. This idea was received favorably by the committee as a way to more adaptively manage our timber sale program.

- Carbon Sequestration and Climate Change Adapted Forest Management
 - o The committee inquired about having some figures and write-up in the work plan regarding climate change and carbon sequestration figures for the state forest. Made plans to attend climate adapted forest management workshop and relay information from the training.

Appendix 9: Public Comments

Any work at Saint John's Rock needs to include expanding the trail at SJR to include all vehicle types and to become a multi-trail Trail SYSTEM. Please also work to the bring the usage and reservation system of SJR to be inline with Wolf Den Run State Park. The current system is cumbersome and difficult to navigate.

James R.
New Windsor, Maryland

XII. Literature Cited

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- Ness, Eric. 2018. *Population Estimate and Structure of Bobcats in Western Maryland*. University of Delaware College of Agriculture and Natural Resources Department of Wildlife Ecology.