SAVAGE RIVER STATE FOREST
ANNUAL WORK PLAN

FISCAL YEAR 2026

Prepared: _____ _____
(Forest Manager) Date

Reviewed: _____ _____
(Regional Forester) Date

Approved: _____ _____
(Environmental Specialist) Date

Savage River State Forest
FY-26
Annual Work Plan

Savage River State Forest
FY-26 Annual Work Plan

I. State Forest Overview

Savage River State Forest is approximately 55,535 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-2025 Annual Work Plan for Savage River State Forest was formulated in 2023. 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-24 Annual Work Plan for Savage River State Forest details eight land management projects that will be the focus of the State Forest management staff for FY-25. 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 – the Sustainable Forest Management Plan for Savage River State Forest was updated in June of 2023 in preparation for the 2023 dual party surveillance audit. The plan will be updated as needed before the 2024 certification audit.

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-25. To date, 100% of the data collection in harvestable stands is completed. Areas of HCVF 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. 5 Silvicultural projects including:
4 Intermediate Harvests / 1 Regeneration Harvest on 274 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-26 Annual Work Plan outlines 4 harvests on 305 acres, producing a harvest of approximately 1,200,000 board feet of sawtimber and accounting for an estimated $400,000 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-25 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-26 Land Management Project Proposals

Approximately 305 Acres

Map Key

1. Compartment 6 Stands 0 & 33-39	*110-Acre Hardwood Thinning*
2. Compartment 6 Stands 25 & 26	*42-Acre Hardwood Regeneration*
3. Compartment 9 Stands 39, 66 & 72	*32-Acre Hardwood Regeneration*
4. Compartment 16 Stands 16-20 & 22	*121-Acre Hardwood Thinning*

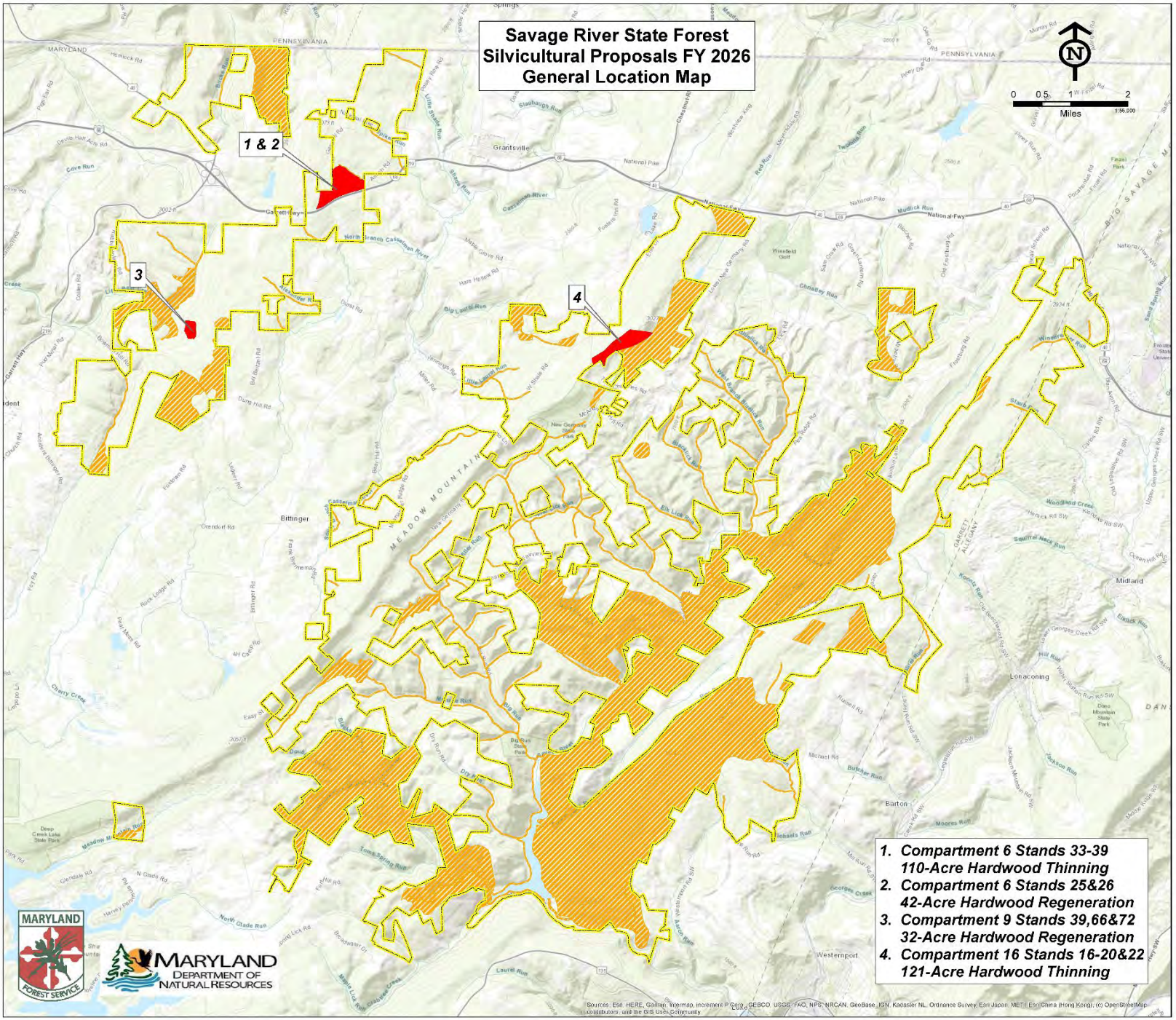


Figure 1. General location map of FY-26 silvicultural proposals

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 Council's® (FSC) and Sustainable Forestry Initiative's® (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 81 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 goecaches are located throughout Savage River State Forest for those interested in testing their navigational and tracking skills. All geocaches must 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.

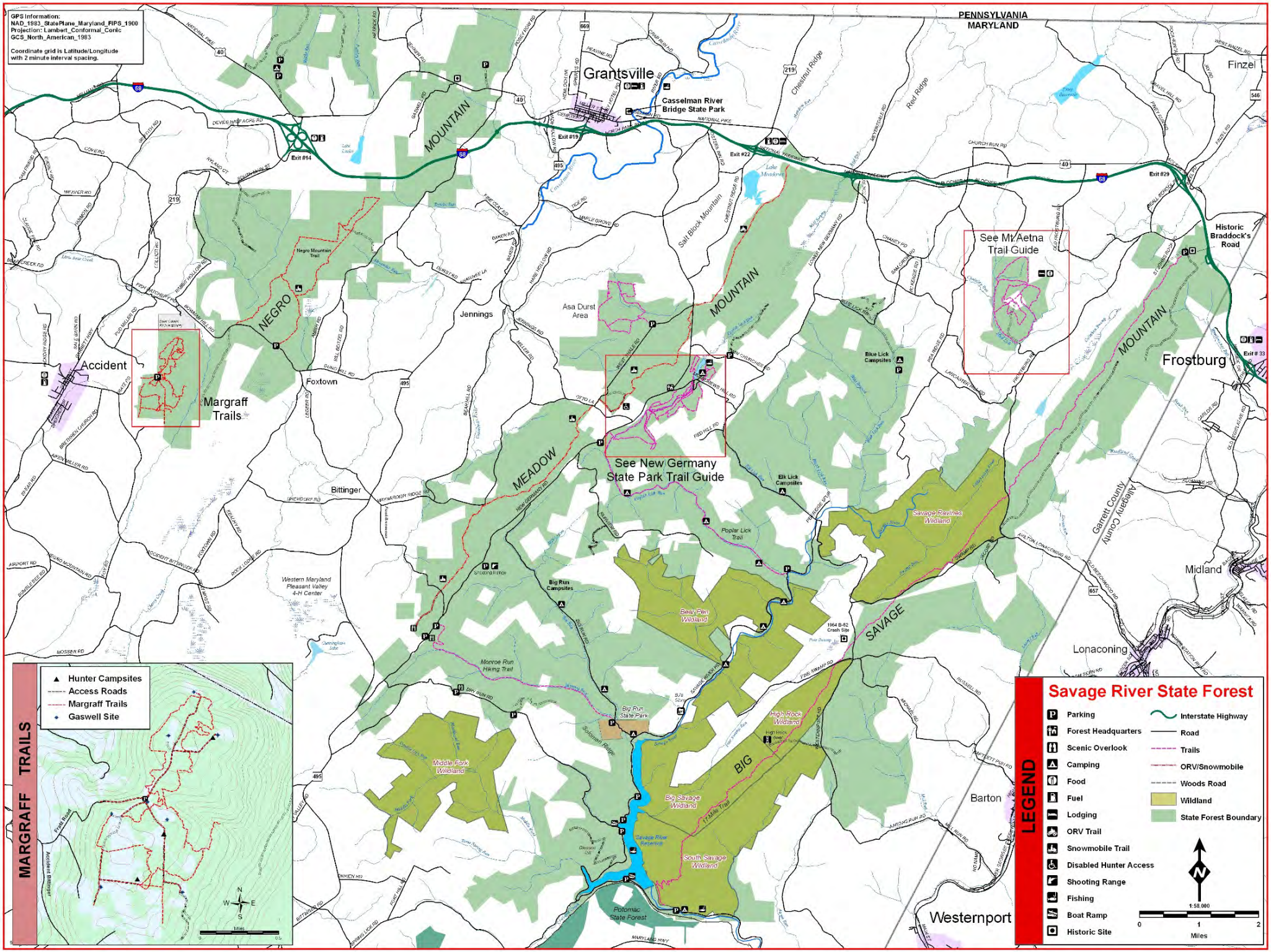


Figure 2. Recreational Opportunities on Savage River State Forest

B. Recreation Proposals

1. Margraff Plantation Trail Expansion

The Margraff Plantation trail project concept that was included in the FY24 Savage River State Forest AWP was approved and has moved into the planning phase with a professional trail contractor. A site visit was held in the fall of 2023 to assess the existing trails and to field review areas that may support new construction of sustainable natural surface trails. Additional project review and permitting have been completed and a construction agreement executed with IMBA Trail Solutions as the construction contractor. It is anticipated that construction will commence Spring 2025.

ASSESSMENT AND PLANNING

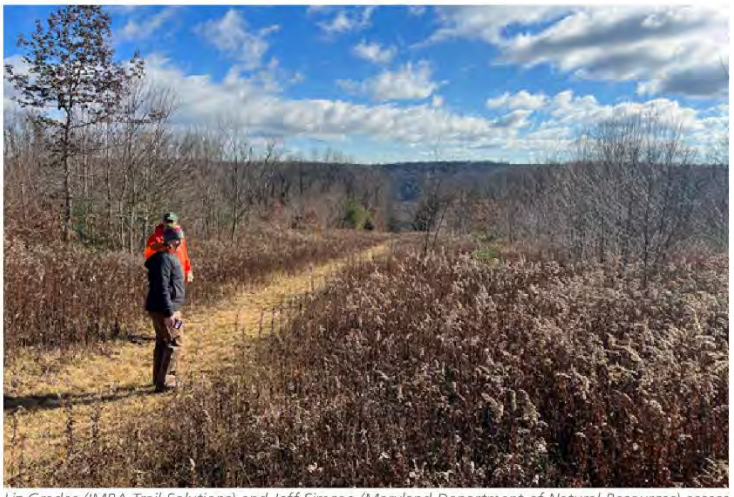
The shared-use and multi-purpose nature of the Margraff property is an essential component of the Savage River State Forest. This planning effort outlines a concept for developing ten miles of trails that work harmoniously with the existing trails, access roads, and infrastructure of the state forest. Utilizing datasets from the Maryland Department of Natural Resources, special consideration was taken to avoid sensitive resources such as wet drainages while maximizing opportunities for quality recreation experiences.

Existing Trails

The existing trail network on the Margraff property includes 5.1 miles of shared-use trails that span most of the site. The trail tread is undeveloped, giving way to grassy paths and seasonal vegetation overgrowth. Sections of fall line trail reach 15% or more, which is restrictive for inexperienced hikers, mountain bikers, and other users. About 1.9 miles of these existing trail segments are recommended to be decommissioned and replaced by trails with more sustainable trail grades. The remaining 3.2 miles of existing trails are expected to be maintained as part of the shared-use trail system. Establishment of mineral soil trail tread would decrease maintenance intervals and significantly improve the user experience.

Conceptual Trails

The conceptual trails on the Margraff property will be bidirectional, shared-use singletrack. Some segments may incorporate technical trail features, but overall, the trails aim to accentuate the natural environment of the state forest. Details on trail development principles are discussed in detail in the resources found on IMBA's website and various IMBA publications. Additional detail on sustainable trail design and sustainable trail construction practices can also be found in the Maryland Department of Environment and Maryland Department of Natural Resources General Permit documentation that is in place for the construction of natural surface trails on property owned by the Department.



Liz Grades (IMBA Trail Solutions) and Jeff Simcoe (Maryland Department of Natural Resources) assess the existing trails near the southern extent of the Margraff trail network.

Machine-built, adaptive-accessible beginner trails in Prescott National Forest, Arizona.

SAVAGE RIVER STATE FOREST

GARRETT COUNTY, MD | TRAIL CONCEPT MAP | PROJECT MDSF2301 | DECEMBER 2023

Note: This map is intended for assessment and planning purposes only. Property boundaries are approximate. Do not use for design development or construction estimates.

TRAIL SOLUTIONS

Segment	Skill	Length (mi)
100	Beginner	0.86
101	Beginner	1.24
102	Beginner	0.71
103	Beginner	0.13
104	Beginner	0.73
200	Intermediate	0.63
202	Intermediate	0.69
300	Advanced	1.42
Total		6.42

LEGEND

- Trailhead Parking
- Primitive Campsites
- Gas Wells
- Hub Location
- Access Roads
- Existing Trails
- Beginner Trail
- Intermediate Trail
- Advanced Trail
- Expert Trail
- Bear Creek Buffer (500ft)
- Conservation Forest
- Future Pine Thinning
- Future Thinning
- Savage River SF
- 100ft Contour
- 20ft Contour

N

0 1,000ft

2. Trail Maintenance Grant – Appalachian Conservation Corps

A trail maintenance specific grant has been awarded to the Maryland Forest Service through Recreation Trail Program (RTP) funding. These funds, administered by the Maryland Department of Transportation (MDOT) State Highways Administration (SHA), will be used to deploy a multi-year (3) programmatic approach to non-motorized trail maintenance in the Western Region State Forests (Green Ridge, Savage River, Potomac Garrett).

The trail maintenance tasks will be accomplished by a 6-8 person AmeriCorps certified saw crew and/or a trail crew. We anticipate logging 1,280 - 1600 labor hours per year in each State Forest and a total of approximately 4,480 labor hours within the Western Region over the term of this grant. No new trails will be constructed as part of this project. All of the work will be conducted on existing trails and on land owned and managed by the Maryland Department of Natural Resources.

3. Savage River State Forest Shooting Range

Insert PJ Writeup from Engineering & Construction

Critical Maintenance funding has been allocated to renovate the shooting range in FY24. Survey work and initial site visit and planning occurred Fall 2023 with hopes to put the project out for bids in the Spring of 2024. New procurement processes and

$300K Allotment
Renovate shooting pavilion
- New metal roof
- Replace siding and gutters
- Minor electrical work
- Ballistic panels in storage room

ADA compliance
- Parking
- Concrete sidewalk behind shooting pavilion
- 2 additional walkways out to the target area – one ADA accessible with mobi-mat

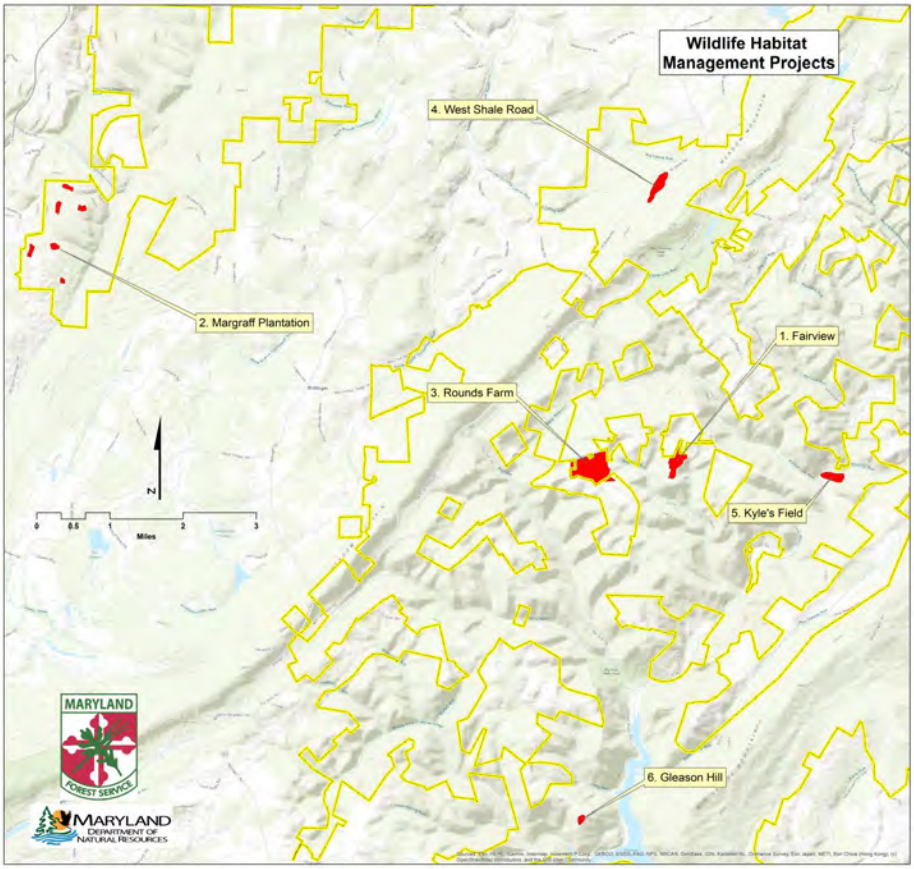
Concrete pad for portapot
Disposal of large shed
Realign parking lot with parking bumpers
- Adjust fence so it's not beyond shooting line
- Minor grading and resurface with gravel

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 Horse Farm property, West Shale Wildlife Area and Margraff Plantation 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 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.



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 (*Lamiastrum 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 (*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.

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.

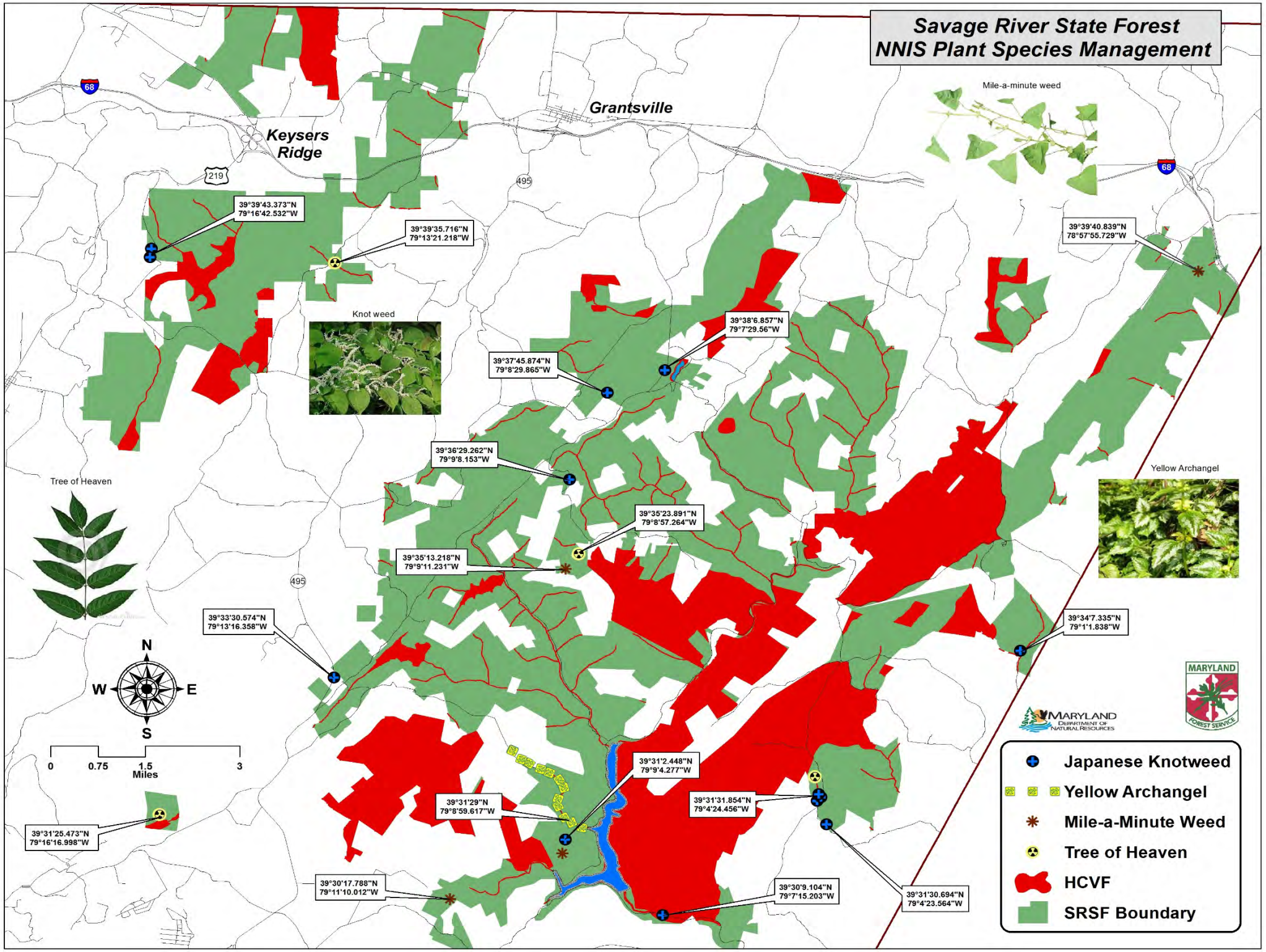


Figure 6. Map of NNIS treatment areas on Savage River State Forest

IX. Monitoring and Research Projects

1. Hemlock Wooly Adelgid Treatment and Suppression Plan
Maryland Department of Agriculture – Forest Pest Management

MARYLAND HEMLOCK WOOLLY ADELGID MANAGEMENT AND SUPPRESSION PLAN

PURPOSE:

This plan was developed in an effort to slow or control the damage to Maryland's eastern hemlock forests caused by an invasive insect called the hemlock woolly adelgid (*Adelges tsugae*). It is also the intent of this plan to serve as a request for project review and the preapproval
of a series of treatment options that can slow the spread of the adelgid in Maryland, for the period of 2024 through 2027. This will allow MDA Forest Pest Management to react quickly when new infestations are found or new treatment options are appropriate. The plan will also allow us to direct our efforts to timely treatments of sites with damaging levels of HWA.

INTRODUCTION:

The hemlock forests of Maryland are part of a unique and often fragile habitat.
Eastern hemlock (*Tsuga canadensis*) is the most shade-tolerant of all North American tree species, requiring as little as 5 percent full sunlight (Silvics of North America – Agricultural Handbook #654). The slow growing conifer, which can take 250 to 300 years to reach maturity, can exceed 800 years of age. Because of its shade tolerance and intolerance of fire it is usually found growing in riparian areas or in steep cove forests in the northern and western tier counties of Maryland. It is estimated that more than 42,000 acres of such forests exist in Maryland.
Eastern hemlock is not a particularly valuable timber species. At one time the tree was sought after for its bark which was important for tannins in the leather making industry. Today, hemlock is used by the pulp and paper industry and its lumber is used for barn siding and other specialty uses. Although its value as a timber species is minimal, it occupies an important ecological niche, and has significant aesthetic and recreational value.

The health of Maryland's hemlocks, and their associated ecosystems, are being threatened by the hemlock woolly adelgid (HWA). This small, exotic insect is native to Asia, and was first found in North America in British Columbia in the 1920's. It was reported in Richmond, Virginia in 1951, and spread northward into Maryland by the 1980's.
Heavy infestations of HWA may result in decline of tree health and eventual mortality.The severity of decline and mortality is often hastened by drought or other pests, such as elongate hemlock scale and hemlock borer.
Tree mortality and decline have been most severe in Virginia, New Jersey, Pennsylvania, and Connecticut. In New Jersey, 55 percent of the state's 26,000 acres of hemlock have been severely impacted. Several stands in Maryland, which have been infested with HWA for more than 10 years, have had extensive decline and some mortality.
Landscape hemlocks in the Baltimore – Washington area were infested in the late 1980's and natural stands in the area became infested by 1990. The infestation steadily moved westward and native stands of hemlock in Frederick and Washington Counties became infested in the early to mid-1990's. Infested hemlocks in Allegany County were found in 1999, and the first infested hemlock in Garrett County was found in December of 2001.

When adelgid populations first moved into much of Maryland there were very few management tools available to stop its spread. Native stands of hemlock, especially in Harford and Frederick Counties, were heavily infested with adelgids and elongate hemlock scale, and were already stressed by several years of drought. By the late 1990's, these areas showed significant decline and mortality. In 2003, the Hunting Creek Hemlock Woolly Adelgid Management Team was assembled to address the dead and dying hemlocks along Hunting Creek in Frederick County, especially in Cunningham Falls State Park. A management plan was developed to remove hazard trees near the high use trails in the park and treat hemlocks that were still healthy enough to benefit from management. Treatments took place in late 2003 and follow-up assessments took place in subsequent years.
The development of new tools for the treatment of HWA, along with the movement of HWA into high value hemlock stands in Western Maryland, necessitated development and implementation of this statewide HWA management plan.

HEMLOCK WOOLLY ADELGID BIOLOGY:
Hemlock woolly adelgids are most easily recognized by the white "woolly" wax they produce on young hemlock twigs. The "wool" is present all year but is most abundant and conspicuous during the spring and fall when egg masses are present. Most other stages in the life cycle are much harder to see. Fully grown adults are only about the size of a period on a printed page.

The life cycle of the hemlock woolly adelgid, like most members of the adelgid family, is very complex. There are two forms of the insect, with each form going through six life stages (egg, four nymphal stages and adult). The following is a simplified version of their life cycle: There are two generations of hemlock woolly adelgid per year. This cool weather species completes most of its development from October through May. Overwintering adults lay eggs in April and May under the white woolly mass. Nymphs (crawlers) hatch and settle at the base of a hemlock needle. They will feed and remain attached to the twig through their maturation into 1st generation adults in late May. Wingless adults then lay eggs which hatch by July. The new crawlers settle on the new growth and become dormant until October. They then resume feeding and develop during the winter, maturing by spring.

Adelgids feed by inserting their tube-like mouthparts into the underside of the base of hemlock needles. As feeding progresses, needles desiccate, turn pale green and drop from the tree. Buds may also die, and in heavy infestations, dieback of major limbs and tree mortality may occur.

In eastern North America, eastern hemlock (*Tsuga canadensis*) and Carolina hemlock (*T. caroliniana*) are highly susceptible to damage by adelgid and often succumb within 6-10 years. HWA is rapidly spreading throughout the range of eastern hemlocks. It is estimated that in the past decade it has spread at a rate of 20-30 km per year. Wind, birds, deer, and humans are factors in both short and long-distance dispersal. Hemlock woolly adelgids (HWA) can now be found in all Maryland counties where hemlocks occur. Throughout much of the State landscape trees as well as natural forest stands have become infested.

ASSESSMENT AND RANKING PROCESS:

In July 2003, a task force was created to assess and prioritize vulnerable hemlock forest stands across Maryland. This multidisciplinary task force was made up of members of the Maryland Department of Agriculture, Maryland Department of Natural Resources, USDA Forest Service, USDI Park Service and other partners. Task force disciplines included entomology, forestry, wildlife management, park and recreational management, fisheries management, agricultural inspectors, geographers and ecologists. The group met to agree on process and to begin assessing vulnerability and value of hemlock stands statewide. A list of approximately 75 priority stands were identified and rated, and later further refined to the original "top 50" list of priority hemlock stands throughout the state on which this management plan will concentrate its efforts. This list has been updated and finalized to include only public owned and public use sites which are eligible for treatment under this plan. Additions to this list must be public owned lands or public use lands and be approved by MD DNR and MDAFPM.
See Table 1 in the full Hemlock Conservation Plan document.

FUNDING:

The Maryland Department of Agriculture, Forest Pest Management Section has received special funding from the US Forest Service to develop and implement a statewide hemlock woolly adelgid suppression plan. This funding has helped support HWA control efforts including soil and trunk injections from July, 2004 to the present. The US Forest Service has also supported MDA's HWA monitoring and evaluation activities. The use of biological control agents (as discussed in the Treatment Options below) has increased and is promising, although still in the research evaluation stage. Predatory beetles that are part of this biocontrol effort are currently supplied by the US Forest Service at no cost to the State, and their availability is dependent upon production facilities under contract with the US Forest Service.

MONITORING:

Evaluating the health of hemlocks and the level of HWA infestations is integral to the successful implementation of a management plan. Since the late-1980's, MDA's Forest Pest Management Section has been conducting HWA detection and impact surveys across the State. This Management Plan will/has identify (ied) priority stands, and FPM staff will concentrate HWA and hemlock health surveys on the priority stands as discussed above.
Detection and monitoring are critical components of an Integrated Pest Management plan. Treatment decisions begin with knowing the location and density of the pest. Priority hemlock stands identified in the plan will be annually surveyed to assess HWA populations. These surveys will begin as soon as summer aestivation ends and the white, woolly masses are evident, usually in early October.

Surveys will classify HWA densities into the following four categories:
None: no adelgids observed.
Light: less than 25% of the trees are infested and most often individual trees have less than 25% of the branches infested.
Moderate: 26-50% of the trees appear to be infested and most often individual trees have less than 50% of the branches infested.
Heavy: more than 50% of the trees are infested and most often the majority of the

branches on individual trees are infested.

An assessment of hemlock health in these stands will be conducted simultaneously with the assessment of HWA densities. Tree health information will be reported on a stand level basis in the following categories:
Healthy: trees appear to be in reasonably good health with less than 10% of the trees showing signs of stress such as: defoliation, needle discoloration, and/or branch tip dieback. Hemlock mortality less than 10% throughout the stand.
Light Decline: trees appear minimally stressed with many trees showing 11-25% defoliation, needle discoloration and/or branch tip dieback. Larger branch mortality may be present but not frequent on trees within the stand. Hemlock mortality less than 10% throughout the stand.
Moderate Decline: trees generally appear under stress with most trees showing 26-50% defoliation, needle discoloration and/or tip dieback. Larger branch mortality is relatively common throughout the stand. Hemlock mortality 11-25% throughout the stand.
Severe Decline: trees appear obviously stressed with most trees showing >50% defoliation, needle discoloration and/or branch tip dieback. Larger branch mortality is common throughout the stand. Hemlock mortality may be more than 25% throughout the stand.

Information from HWA and hemlock health surveys will be entered annually into a stand database. This information will be used to direct additional surveys, public information, and treatment and restoration efforts.

Efficacy Surveys: To determine the efficacy of treatments, surveys will be conducted to determine pre and post HWA levels at a sampling of currently treated hemlock stands each year. A small sample of control and treated trees at these sites will be checked at time of treatment and again one year later. The data collected will be entered into an efficacy database.

TREATMENT OPTIONS:
The selection of treatment options for landscape or forest areas will be based upon HWA population levels, hemlock health, access to the trees/stand and proximity to sensitive riparian areas. The decision to treat a stand and its inclusion in this plan is based upon management objectives and the aesthetic, wildlife, recreation, fishery, forestry, and natural heritage values of the stand.

There are currently no proven methods available to suppress HWA in a large scale forest setting. However, MDA has been able to treat significant sized areas or parts of stands over the years by efficiently using methods which are available for individual tree treatment or treatment of groups of trees. Current insecticide treatment options include the use of foliar sprays or systemic insecticides. Foliar sprays involve the application of horticultural oil or insecticidal soap via hydraulic sprayers and are limited to trees where access is possible by truck mounted equipment and areas where insecticide drift would not contaminate streams and lakes. Systemic insecticides can be applied either through soil injections, soil applied tablets, soil drenches, trunk sprays, or stem injections. Although the various types of soil treatments have proven to be the most effective method of systemic applications, stem injections are recommended for hemlocks growing within 50 feet of open waterways. Research is currently

underway for the application of aerial fungal pathogens to suppress hemlock woolly adelgid populations. Should this prove effective, aerial fungal spraying may be incorporated into this plan.

Treatment options for hemlocks in the landscape are much different than those available for forest situations. Easier access for application equipment and lack of sensitive riparian areas allow for a wider range of treatments in the landscape environment.

The most widely used systemic insecticide for HWA is imidacloprid. Various formulations of imidacloprid are available depending on the method of application and equipment to be used to deliver the product. Treatments with imidacloprid are normally done in the early spring or late fall when there is adequate soil moisture present. Systemic insecticides are translocated by the tree up to the crown where the pest is feeding and control usually occurs within 2-6 months. Systemic insecticides can be injected into the soil around the base of the tree, injected into the trunk of the infested hemlock, or sprayed on to the trunk of an infested tree. Trunk injections are not recommended on trees less than 4" in diameter. Soil injections and trunk sprays should only be used around trees that are a safe distance from water sources.

HWA population densities often fluctuate normally as a result of two generations per year, declining tree vigor caused by heavy adelgid infestations and/or other variables such as drought and other insects. Extreme cold winter temperature will also impact adelgid survival. As such, final treatment decisions must be made near the time of treatment to identify the need and specific trees to be treated.

Ultimately, treatment decisions will be made considering numerous factors including rank, infestation level, tree health, available treatments options, funding and likelihood of success.

LANDSCAPE TREE TREATMENT OPTIONS:

Options for trees or parts of stands that are easily accessible AND do not have environmentally sensitive areas (such as streams) nearby:

- Cover sprays with insecticidal soap, dormant oil or horticultural oil.
- Cover sprays with contact or foliar absorbed insecticides.
- Trunk injection with imidacloprid.
- Soil injection with imidacloprid.
- Soil drench with imidacloprid.

FOREST STAND TREE TREATMENT OPTIONS:

Options for stands that are inaccessible or have environmentally sensitive areas nearby:

- Trunk injection with imidacloprid (when environmentally sensitive areas are an issue).
- Soil injection with imidacloprid.
- Soil drench with imidacloprid.
- Imidacloprid tablets applied in soil
- Trunk sprays with Safari
- Biological control: release of predatory beetles or other natural enemies

as they become available.

TREATMENT OPTION DETAILS:

Cover Sprays: Individual hemlocks or small groups of landscape trees greater than 50' from sensitive areas or streams can be treated with insecticides using ground equipment, such as mist blowers or hydraulic sprayers. The use of this ground equipment limits the selection of this option to areas with good road access adjacent to the trees needing treatment. The insecticide, as well as the equipment, used will be site specific and dependent upon tree size, location and health, HWA population levels and time of year. Dormant oil, horticultural oil, insecticidal soap or foliar absorbed insecticides can be used as cover sprays. The application of any of these insecticides will follow EPA- approved label guidelines.

Dormant Oil: This option will be used on individual trees or small groups of trees <30' in height. Dormant oils suffocate adelgids, so must be applied directly to the insect when they are immobile. Dormant oils are applied during the 'dormant' season for most insects, from November to March, although HWA are active during this time, it is still the appropriate time for dormant oil treatment of HWA. An example of a site where dormant oil cover sprays may be used is the parking lot areas of some State Parks, such as Rocky Gap or Deep Creek Lake.

Horticultural Oil and Insecticidal Soap: The selection and application of horticultural oil will follow the same guidelines as dormant oil, with the exception of time of year for application. These oils are used when temperatures are warmer, and will be used from April through June, and September.

Foliar Absorbed Insecticides: The use of foliar absorbed insecticides is restricted by the proximity of the hemlocks to open water. While cover sprays using registered insecticides such as abamectin and imidacloprid are very effective in reducing HWA populations, they will be used only when there is sufficient distance from water, and will closely follow label restrictions. The timing for use of cover sprays with insecticides is during the season when there are immature or unprotected life stages; usually from July through October.

SOIL TREATMENTS:

Soil treatments eliminate the concern for drift of insecticides from mist blowers or hydraulic sprayers. However, insecticides injected into the soil can move short distances and will not be used within 50ft of waterways. Soil treatments have many advantages: they can be used on large trees with canopies beyond the reach of ground application equipment, the chemical is absorbed through the roots, and control may extend 5 to 7 years after application. The distribution and transport of the insecticide within a tree is affected by its health; trees under drought stress, with needle loss and dieback may not effectively transport the chemical. As compared to trunk injections, soil treatments have the advantage of not wounding the tree.

Soil Injection: A liquid flowable insecticide formulation of imidacloprid (e.g. Imidacloprid 2F) applied using a kioritz injector, EZ-Ject soil injector, or backpack soil injector around the base of infested hemlocks will be the treatment option of choice for stands of hemlocks at least 50ft away from water. Individual trees or small groups of trees that are 50ft or more away from streams will be treated using soil injection. Larger stands will be treated in increments over time using this method.

Tablets: Imidacloprid tablets (i.e. CoreTect) will be applied into the soil around the base of trees at a rate of 2 tablets per inch DBH. These can be used in the same areas as soil injections

but have the advantage of ease of application and less equipment to carry, which is useful in hard to reach or long hike areas. Tablets will be used at a rate of one tablet/seedling during restoration plantings to give newly planted seedlings protection against HWA.
Soil Drench: A liquid flowable insecticide formulation of imidacloprid (e.g. Imidacloprid 2F) may also be applied using a soil drench method to treat hemlock shrubs or saplings. These treatments consist of uniformly applying the dosage in no less than 10 gallons of water per 1000 square feet as a drench and targeting the root zone. Soil drench methods would be used in areas where protecting hemlock regeneration is important.

***TRUNK INJECTION*:**
Direct tree trunk injections will be the treatment of choice for trees or groups of trees less than 50ft from water. Treatments will be conducted in the spring and fall. Treatments will utilize a formulation of imidacloprid (i.e. IMA-jet) in conjunction with the Arborjet Tree IV or F12 series systems.

TRUNK SPRAY:
Dinotefuran (i.e. Safari) can be used as soil drench, a soil injection, or as a trunk spray. It can be used for its quick knockdown effect against HWA and is also effective against the elongate hemlock scale. However, dinotefuran does not have the same long-lasting effect of Imidacloprid; treatments are only effective for two years. A mixture of imidacloprid and dinotefuran has been used as a basal trunk spray in NY, and dinotefuran is currently being incorporated into treatments in MD in areas where elongate hemlock scale is damaging trees in conjunction with HWA.

BIOLOGICAL CONTROL:
The ultimate control and management of HWA will involve the long-term regulation of populations utilizing biological control agents. University and federal researchers have investigated several species of predatory beetles for biocontrol, and since the late 1990's there have been numerous experimental releases. These releases are still experimental, and Maryland has participated in evaluating the effectiveness of using these biocontrol agents at several locations over the past 20+ years.

As part of this plan, several biological control agents approved for release by APHIS, including species of lady beetles (Coccinellidae), species of Derodontid beetles, and species of *Leucotaraxis* flies will be considered for release. It should be noted that these releases are still in the evaluation stage and although there is hope that they eventually play an important role in the regulation of HWA populations, they should not be looked at as a short-term control measure.
***Sasajiscymnus tsugae*:** Over 3 million *S. tsugae* have been released across the east coast. This species, native to Japan, had been released in several locations in Maryland since 1999. While cooperators in New England have seen some success with this beetle, MDA has seen minimal establishment. No additional releases are proposed.
***Laricobius nigrinus*:** This Derodontid beetle, native to northwest US and British Columbia, is one of the most important species being evaluated for HWA biocontrol. MDA is cooperating with the USFS and Virginia Tech University to evaluate the ability of this beetle to become established and reduce HWA populations. In 2003, MDA and Virginia Tech released *L. nigrinus* near Frostburg, and since then it has been released at many sites in the state. Established reproducing populations are now found at several locations in Maryland. Additional releases,

monitoring efforts, and efficacy surveys will be proposed as part of this plan.

***Laricobius osakensis*:** In 2010 this Derodontid beetle, native to Japan, was approved for HWA biocontrol in the United States. In predation studies, *L. osakensis* was shown to feed on more HWA ovisacs than *L. nigrinus*, and hybridization experiments suggest *L. osakensis* is far less likely than *L. nigrinus* to hybridize with native *L. rubidus*. MDA is cooperating with the USFS and Virginia Tech University to evaluate the ability of this beetle to become established and reduce HWA populations. Beetles have been released at multiple sites in the state, with hopes of continued releases. Recoveries of *L. osakensis* have been observed. Releases, monitoring, and efficacy surveys are proposed for this plan.

Leucotaraxis argenticollis and ***Leucotaraxis piniperda*** are two species of predatory Chamaemyiid silver flies native to the west coast of the US. *Le. argenticollis* and *Le. piniperda* are important predators of HWA on the west coast and have shown potential in unique biological control of HWA; unlike other predators who do much of their feeding on the winter sistens generation, *Leucotaraxis* flies may be able to target both yearly generations of HWA, especially the spring progrediens generation. Experimental releases in partnership with USFS and VA Tech were conducted in 2022. Additional releases, monitoring efforts, and efficacy surveys will be proposed as part of this plan.

***Scymnus sinuanodulus*:** This Coccinellid beetle from China was approved for release in the eastern US. To date, two releases have been made in Maryland with no recovery. No additional releases are proposed.

***Scymnus camptodromus*:** This Coccinellid beetle from China is undergoing evaluation and is not yet approved for release.

Scymnus coniferarum: This Coccinellid beetle is native to the western US and has been approved for release in the eastern US. Releases have taken place in Maryland, but no recovery has been recorded. This species was deemed unsuitable for HWA biocontrol because it prefers to feed on pine adelgids. No additional releases are proposed.

ESTABLISHMENT OF VIABLE INSECTARIES

Part of MDA's biological control plan includes establishment of insectaries to supplement out-of-state collections and reared releases of biological control organisms. In 2004, MDA established its first insectary at Rocky Gap State Park, using *L. nigrinus* beetles gathered in situ from the Pacific Northwest and lab-reared beetles from Virginia Tech State University. Since 2004, the Rocky Gap insectary has produced thousands of *L. nigrinus* beetles that have been released across the state of Maryland and Mid-Atlantic partner states.

In 2016 a new insectary was established at Big Run State Park by planting 100 hemlock seedlings received from PA DCNR Penn Nursery near a row of established hemlocks. In 2018, 275 *L. nigrinus* from the Rocky Gap insectary were introduced to this new plot. Supplemental augmentation of *L. nigrinus* populations in the insectary began in Fall of 2019, and recovery of beetles had been observed in 2024.

MDA FPM will continue to establish healthy populations of *L. nigrinus* from these founding insectaries and will supply insects to surrounding states for their own biological control efforts. In addition to increasing the viability of *L. nigrinus* populations, this work will liberate resources for rearing laboratories, allowing them to focus research and development on new biocontrol organisms.

SILVICULTURE AND GENETIC RESISTANCE

Of the eight extant species in genus *Tsuga* the eastern hemlock is the most susceptible to HWA and the least genetically diverse. Phylogenetic analyses have shown that eastern hemlock is unique among its genus; even the Carolina hemlock (*Tsuga caroliniana*), which completely overlaps the southern range of eastern hemlock, is more closely related to Asian *Tsuga* species. While the Carolina hemlock is also being seriously threatened by HWA, its genetic lineage allows for resistant hybrids crossed with Asian species to be bred. Research at USDA's South Farm in Beltsville, Maryland suggests that some of these natural hybrids between *T. chinensis* and *T. caroliniana* show good survival and resistance to HWA. Eastern hemlock, however, cannot currently be crossed with resistant members of its genus. The western species, *T. heterophylla* and *T. mertensiana*, show some resistance to HWA but they do not grow well on the east coast, suggesting that much of their success against HWA comes from the assemblage of associated native predators.

While this bodes well for the eventual success of establishing a host of classical biological controls, the fact remains that hybridization of eastern hemlock to protect against HWA is highly unlikely. However, isolated instances of naturally HWA-resistant eastern hemlock have been found among dead and dying trees in Connecticut, New Jersey, Pennsylvania, and Maryland. These "Bulletproof" stands offer another avenue for management of HWA.

In 2015, a restoration plot at Cunningham Falls State Park included plantings of eastern hemlocks from the "bulletproof" stand in New Jersey. This plot was inoculated with HWA in 2017, and research into the health of these trees is ongoing. Current research indicates that these trees are resistant to both HWA and elongate hemlock scale. MDA will continue monitoring this plot for HWA resistance.

Light availability plays a major role in HWA mortality and hemlock decline, with increased light availability improving hemlock growth and tolerance to HWA infestation. Selective cutting to create canopy gaps may be a potential strategy to preserve individual high value trees or produce high-quality hedges for biocontrol establishment.
MDA FPM receives seedlings of eastern hemlock from PA DCNR Penn Nursery using Maryland seed stock. In partnership with MD Department of Natural Resources, these seedlings are used in hemlock restoration projects at critical areas throughout the state. Future restoration plots are chosen in close partnership with MDNR. Areas with significant loss of hemlock resource are identified by MDNR and MDA FPM staff for potential restoration projects.

PRESERVATION OF GENETIC MATERIAL

In light of the real threat of extirpation and extinction of eastern and Carolina hemlock, the US Forest Service has partnered with Camcore, a non-profit international tree breeding organization, to preserve hemlock genetic material. Seeds of eastern and Carolina hemlock have been collected throughout the plants' native ranges to be stored in long-term seed banks. In addition, plantings of seeds from North American eastern and Carolina hemlock across 78 native populations have been established in Chile, southern Brazil, and Arkansas to act as seed reserves that are geographically protected from HWA. If HWA is ever thoroughly controlled, these banks

of genetic information will be invaluable for healthy and diverse restoration plantings. MDA FPM conducts yearly surveys of treated hemlock sites for viable hemlock cones. This supply of Maryland hemlock genetic information is provided to PA DCNR Penn Nursery for continued seedling production so that state restoration projects can continue with Maryland native seedlings. MDA also provides collected seed for Camcore's seed bank project, to ensure the state's hemlock genetic material is preserved.

RESEARCH AND PARTNERSHIPS:

MDA-FPM will continue its longstanding commitments with its cooperators to assist with research on efficacy, winter mortality, hemlock resistance, regeneration, new biological control agents, and explore new treatment options as they become available.

MDA FPM collaborates with the MD Department of Natural Resources (DNR) and the Maryland Conservation Corps on fall and spring projects where hemlock trees on state park lands are treated. MD DNR Forest Service & Park Service also collaborate on other treatments and in restoration plantings. MDA FPM has collaborated with The Nature Conservancy and Maryland Ornithological Society to treat hemlocks on their properties and ensure larger corridors of hemlocks and their habitat are conserved.

2. American Redstarts Foraging Study
Compton Science Center – Frostburg State University

Project Description:
This study examines the flexibility in foraging behavior in a long-distance migrant bird, the American Redstart (Setophaga ruticilla). Though itself not of conservation concern, this species, like all birds that specialize on aerial insects, is experiencing declines as the abundance of these prey items decline due to anthropogenic causes. As such, recognizing how a species such as American Redstarts respond to intra-annual changes in the prey community will illustrate the degree to which they are able to shift along with changes in the prey community overall.

Moreover, redstarts are engaged in competitive interactions with a variety of closely related species (family Parulidae of the Passerine, or song birds), which are a model group for studies examining inter- and intra-specific competition in relation to prey availability. They have been central to our understanding of foundational concepts in niche theory and niche portioning since its inception (MacArthur 1958). As such, in addition to potential benefits in our understanding of how these species may adjust to a changing world, this study will also improve our basic knowledge of how niche breadth and flexibility may play an important role in mediating interspecific interactions in this central study system.

Graduate student Sarah Ferguson, project lead and Frostburg State faculty member Dr. Cody Kent, and potentially one or two undergraduate field technicians will collect behavioral data via observation of wild American Redstarts throughout the course of their breeding season (May-August 2024) in the Alleghany and Garrett counties of Maryland. Exact data collection sites have not been determined but are expected to be located within New Germany State Park, Savage River State Forest, and Green Ridge State Forest (see attached map of American Redstart sightings in these areas from previous years).

Cody Kent has conducted research centered around redstarts and their underlying prey community since 2015 in both Jamaica and Louisiana, including seven published papers. This includes work specific towards quantifying insect communities for studies of avian prey (e.g., Kent et al. 2019, Journal of Field Ornithology) and warbler foraging behavior (e.g., Kent et al. 2020, Ecology). Sarah Ferguson has experience taking observational data of free-flying wild birds through her course in Ornithology, and will additionally receive training in doing so from Kent. However, these birds will not be in any discomfort and will only be observed in their natural setting.

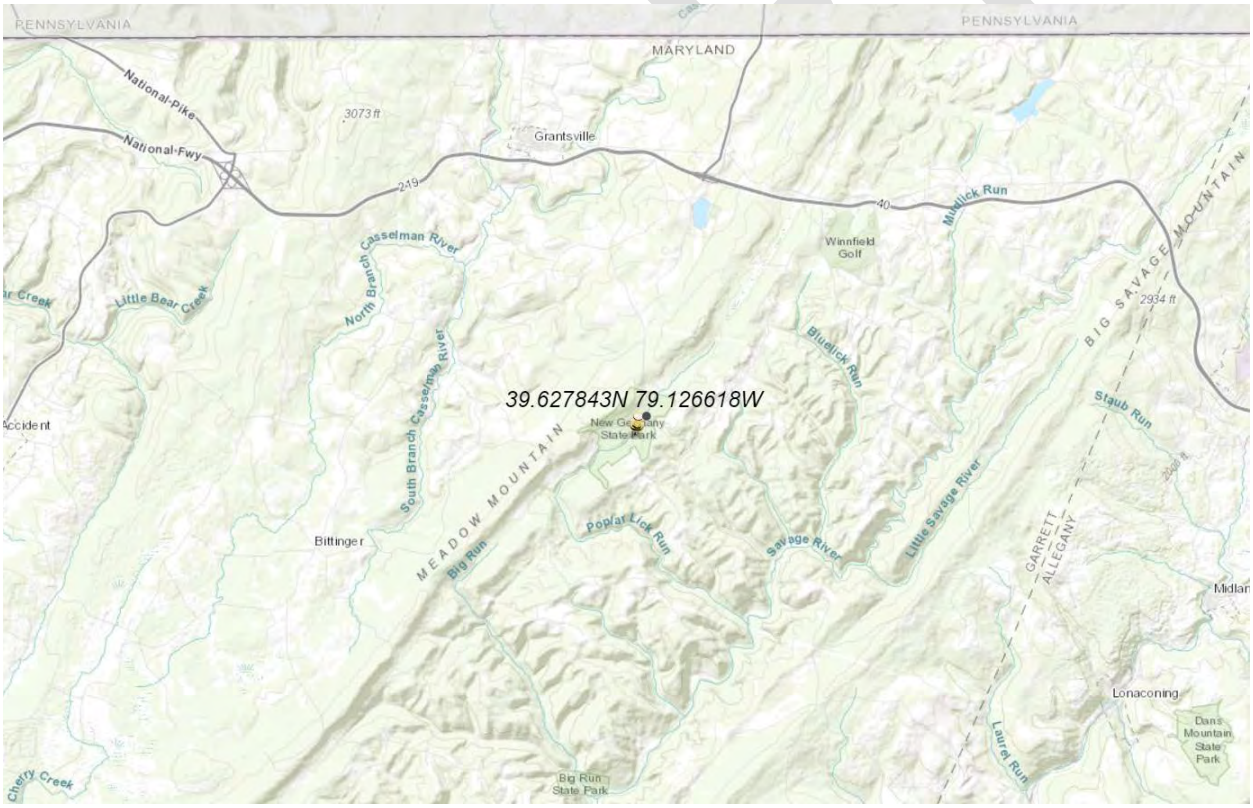
Our intention in all observations is to not disturb the animal in any way – as we wish to observe its natural and undisturbed foraging behavior. These will be primarily accomplished from observing the bird from the spot at which it was first sighted and avoiding approaching them closely. Though there is the possibility of some low-level of disturbance, and animals may try to avoid humans, this will be minimal.

Concurrently, the insect community will be quantified using two methods: Sweep netting and sticky traps. In sweep netting, every 50m along the transect, a sweep net will be swung 10 times at brush and the insect community identified, followed by the insects' release. Sticky traps will

be placed in trees (~25 ft above the ground), for a maximum of 7 days to collect insects. This insect collection is necessary to ascertain changes in the prey community and their potential links to changes in foraging behavior. The number of insects captured on the sticky traps will have no measurable impacts on the prey community overall.

General Site Conditions:
Sites within New Germany State park are likely located off the Hemlock Trail and Gazebo Loop of New Germany State Park, in forested and mountainous terrain (see attached maps). They are just west of Poplar Lick Run and sit higher in elevation, along a ridge. Current site conditions and exact observation/sampling locations have not yet been determined but will be assessed in the coming weeks, as breeding season gets closer and American Redstarts begin to return to the area. Dense, mixed deciduous and coniferous forest is anticipated, with hemlocks and other conifers intermingling with oaks and other hardwoods.

Potential sites are located in Sensitive Species Project Review Areas (SSPRA) and areas extremely significant for biodiversity conservation. Project Considerations: Tight timeframes due to the start of the breeding season (mid-May).



3. Emerald Ash Borer Biocontrol and Monitoring
University of Maryland – Department of Entomology

Project Description: To date, the emerald ash borer (EAB; Coleoptera: Buprestidae), native to Asia, has killed hundreds of millions of ash trees (*Fraxinus spp*.) as it continues to spread throughout the United States and Canada. With their continuing impact to ash forests, it is important to monitor the population growth and spread of EAB throughout the state, and to evaluate and improve the efficacy of classical biological control as a method against EAB and to protect the ash. The purpose of this document is to seek continuing permission for research efforts to assess the efficacy of non-native parasitoid wasps as biological control agents on populations of EAB (three larval parastioids, *Spathius galinae, Spathius agrilii*, and *Tetrastichus planipennisi*, and the egg parasitoid *Oobius agrili*).

DNR land units for research include the following: Big Run State Park; Casselman River Bridge State Park; Catoctin Mountain Park; Cunningham Falls State Park; Deep Creek Lake State Park; Fair Hill Natural Resource Management Area; Gambrill State Park; Gunpowder Falls State Park; Martinak State Park; Millington WMA; Nanticoke River WMA; Old Bohemia WMA; Patapsco Valley State Park; Pocomoke River State Park; Potomac-Garrett State Forest; Savage River State Forest; Susquehanna State Park; Tuckahoe State Park; Zekiah Swamp NEA.

We are currently permitted to work in most of the listed parks and reserves, effective through December 2026. In this request, we seek continuing permission at those sites and add several additional sites. This ongoing project would extend through 2026 and will include continued monitoring at time points throughout the year. During these periods the sites will be accessed from the nearest paved area on foot. Most trees are reached by vehicles to the closest paved area, followed by access by foot on trails. We also provide details on an additional method not listed in the prior permit application, which is focused on assessing populations of the egg parasitoid, *Oobius agrili*. We would continue to consult with the managers of each unit before accessing sites for research activities. Site managers have varying preferences or requirements and we will gather that information and follow instructions.

Maps: The following maps below show where known previous releases have occurred, as well as general overviews of possible new sites. Each map is titled with the site name and includes coordinates for release sites. Coordinates are also included for some of the general area maps, based on previous year data. Sampling will occur in the general area around release trees that are accessible by foot.

General Site Conditions: Site conditions will vary site by site, for each tree, and throughout the study period. Sites in northern and western Maryland consist of forested and mountainous terrain accessed via local roads. Sites in southern Maryland generally consist of swampland in close proximity to highways or residential areas. The sites will be accessed from the nearest paved area on foot. Most trees are reached by vehicles to the closest paved area, followed by access through trails on foot. Visitation, insect trap deployment, and any destructive sampling (i.e., debarking) are coordinated in consultation with park management. We do not fell and remove healthy trees, only those that are infested with EAB and with consent from management.

Project Considerations: Surveys, deployments, and recoveries are time sensitive because of insect phenology and life cycle. Deployment of sentinels may include drilling a hook into trees, and the

burlap strap method would require a light scoring of wood to induce tree volatiles if the tree is not already heavily infested with beetles. Deployed sentinel logs or burlap strips will have a tag with project and contact information attached and GPS coordinates recorded and would be removed following field exposure. This project is a cooperative effort with collaborators from both the USDA and MDA.

Goals: Within the broad overarching goal to assess the efficacy of biological control, measured by reduced population growth and spatial spread of EAB, and reduced impact on ash (*Fraxinus* spp.), we use methods to 1) monitor ash health, survival, and regeneration; and 2) measure the population growth and phenology of EAB across the state; and 3) assess the establishment of four non-native parasitoid species [and any additional native spp.]. Methods for each are described below.

1) Ash health, survival, and mortality is assessed using replicated transects, to be performed at all sites where ash trees and saplings can be located. Per site, we use six 50mx2m transects where at least one ash tree or sapling can be located. Ash trees and sapling within each transect are measured for diameter at breast height (DBH) and checked for signs of EAB infestation by measuring crown cover, and the number of epicormic shoots, bark splits, wood pecks, and D-shaped exit holes. This work occurs in the spring or summer after leaf flush.

2) During the fall and winter, EAB population growth and parasitoid establishment will be assessed by debarking with a draw knife. Three small, living ash trees with visible symptoms of EAB infestation (woodpecker damage, bark splits, D-shaped exit holes) will be selected from each site and their GPS coordinates recorded. Trees with such infestation are not expected to recover or survive left unchecked. Each will be assessed by felling the tree, then debarking – or bark peeling – using draw knives to remove outer and inner bark tissue and expose the EAB growth stages in the cambium underneath. Each EAB gallery/pupation chamber will be examined for the larval life stage, fate (alive/dead/emerged), and mortality source (removed by avian predators, killed by host resistance, parasitized). Debarking may occur in the field, or the ash logs can be removed for processing on the College Park campus.

3) Parasitoid recovery and long-term establishment is recorded by observing brood or adults reared in a greenhouse setting using trees logged from sites during the winter, parasitized EAB larvae found through debarking of trees and cultured in the lab, adults recovered from yellow-pan traps, and following oviposition of parasitoids on larval sentinel logs (larval parasitoids) or ‘burlap strips’ that serve as traps (*Oobius*). The debarking method is described above, the balance of methods are as follows:

i Yellow pan-traps (used infrequently): Two 12-oz, 7–8 inch bright yellow plastic bowls are mounted on shelf brackets attached to trees using wood screws and filled with food-grade propylene glycol and a dab of dish detergent. Bowls are left for 5-7 days, after which the contents are examined for parasitoids, which are attracted to the yellow color. When used, YPTs may be deployed multiple times through the growing season. An alternative method, also infrequent, uses the yellow cards coated with sticky tanglefoot to entrap insects attracted to the yellow card.

ii. Larval sentinel logs. Sentinel logs are created by infesting small ash sticks with EAB eggs, then incubating until they develop into L3 and L4 stages. They are then deployed to field sites (hung from ash trees, with each log’s coordinates recorded) for two weeks to allow for oviposition to occur. Ash tree health surveys are performed on each tree that a sentinel log is deployed on. Deployment rounds

will occur 4-6 weeks apart. Once collected, the sentinel logs are kept in growth chambers to monitor for emerging parasitoids, then dissected to record the fate of each original egg.

iii. Burlap strips (0.03m x 1m) will be wrapped around ash trunks and branches of trees that show signs of infestation approximately one week after EAB emergence starts to increase during the spring (usually May, ranging from April through early June). The traps will then be monitored for EAB eggs and parasitoid activity, specifically focusing on the egg parasitoid *O. agrili*. This method allows for visual observation of egg parasitoid activity, as EAB eggs turn black 5-7 days after an attack by *O. agrili*.

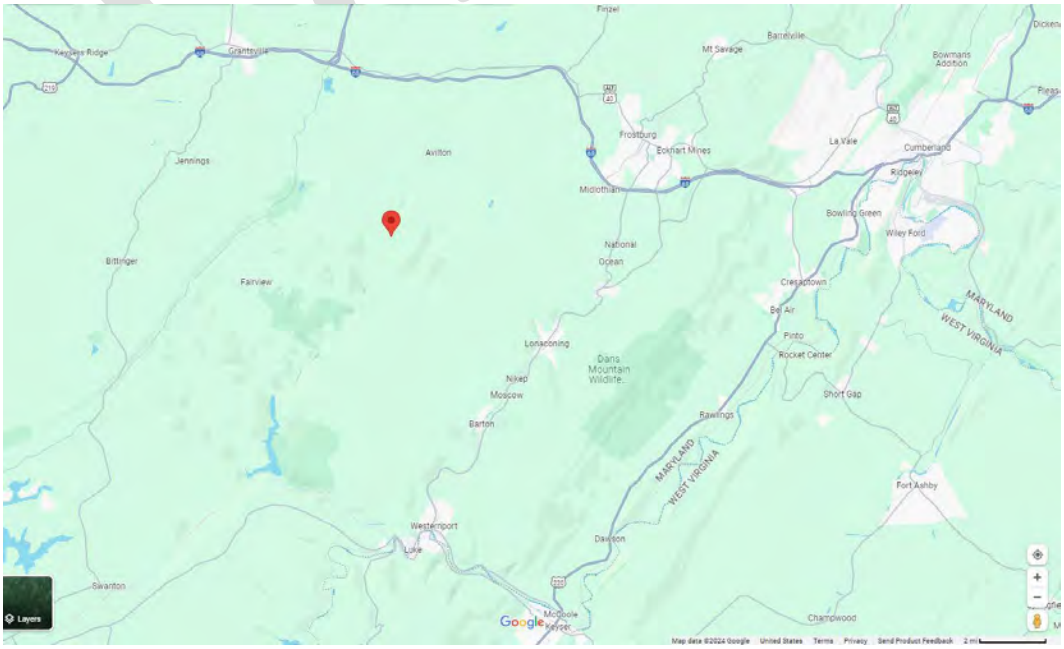
Overall, these methods will increase our knowledge of parasitoid establishment and efficacy and help to fill gaps in national and state-wide recovery efforts. This research will contribute to several long-term data sets and post-release monitoring, which are key to understanding and improving biological control campaigns of parasitoids in the effort to slow EAB infestation throughout the United States and Canada.

4. National Rivers and Streams Assessment
Maryland Biological Stream Survey / Environmental Protection Agency EPA

Project Description: Maryland Biological Stream Survey staff are tasked with completing stream surveys in conjunction with the EPA as part of their National Rivers and Streams Assessment (NRSA). Sites have been randomly selected across the state, and one site is on Blue Lick Run within Savage River State Forest. NRSA sampling protocols would include the following: backpack shocking to survey the fish community, sampling water quality, collecting a benthic macroinvertebrate sample by kicking into a D-net, and assessing habitat and riparian areas along the site. Additional aspects of sampling include taking a periphyton sample, obtaining a fish plug from one or two individuals and measuring the slope and bearing of the stream. The length of each NRSA site is 40 times the average wetted width and will be determined the day of sampling. We estimate the sampled reach to be approximately 600 meters (site midpoint: 39.61376346, -79.06918814). This sampling event would likely occur over a single day and be scheduled to occur in July.

General Site Conditions: The site will be primarily in the stream channel of Blue Lick Run. Accessing the riparian area/floodplain of the stream would be frequent as we work our way through the site. While we have not observed or scouted the site directly yet, based on satellite imagery and knowledge of the area, we expect it to be heavily forested, mountainous terrain. The site should be fairly remote, as access from the nearest possible road will involve about a one kilometer hike to the stream. This portion of Bluelick Run would qualify as a third-order stream with a relatively high gradient.

Project Considerations: We expect to encounter Brook Trout at this site and would plan to collect, identify, measure and release the brook trout as quickly as possible. NRSA protocols do include collecting fish tissue at each site. The protocol involves collecting two plugs of fish tissue, preferably from two different individuals. Both fish must be at least 190 mm and the smaller must not be less than 75% the total length of the larger fish. If only one suitable fish is found, both tissues samples are taken from the same fish. The sample consists of muscle tissue and is collected from near the dorsal fin. At this site, it is likely the only suitable individuals, if any, that would qualify for tissue collection would be Brook Trout. No fish tissue sample will be taken, if the trout or other species are not at least 190 mm.

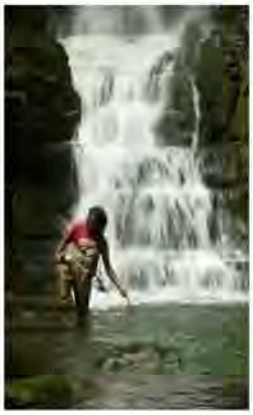


National Rivers and Streams Assessment 2023-24

United States Environmental Protection Agency

A Fact Sheet for Communities

The U.S. Environmental Protection Agency (EPA), states, and tribes are conducting the second nationwide survey of the condition of the nation's rivers and streams. The survey will help citizens and water quality managers measure the health of our waters, evaluate the effectiveness of protection and restoration efforts, and take actions to prevent pollution. This *National Rivers and Streams Assessment 2023-2024* is one in a series of surveys of the condition of the nation's waters and the sec-ond survey of the nation's rivers and streams (see https://www.epa.gov/national-aquatic-resource-surveys).



Designed to estimate the percentage of rivers and streams that are in good, fair, or poor condition, the survey will serve as a scientific report card on America's flowing waters. It will examine ecological, water quality, and recreational indicators, and assess how widespread key stressors (such as nutrients, degraded riparian habitats, and bacteria) are across the country.

The survey is a collaborative effort that involves a large number of state environmental and natural resource agencies, federal agencies, universities and other organizations. In many states, state water quality staff will conduct the water quality sampling and habitat assessments. In others, field work will be conducted by staff under contract to EPA.

U.S. Environmental Protection Agency

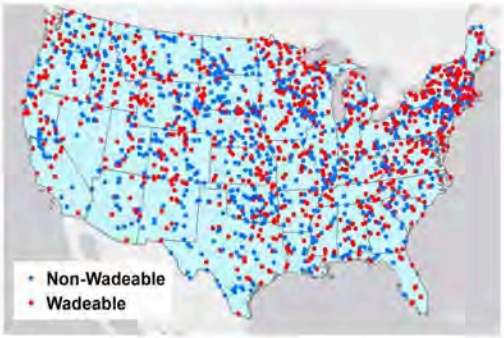
1200 Pennsylvania Ave. NW (4503T)

Washington, DC 20460

October 2022

How were sites selected?

A total of 1,808 sample sites were selected to represent the condition of rivers and streams across the lower 48 states. Of these, half are rivers and half are streams. Sites were selected randomly using a statistical survey design to represent the population of rivers and streams in their ecological region – the geographic area in which climate, ecological features, and plant and animal communities are similar.



Sampling sites for the National Rivers and Streams Assessment

What about my local river or stream?

If your local waterbody is being sampled for this survey, it was selected randomly from the population of rivers and streams in your part of the country, not because it

exhibited any particular problem or water quality condition. When the final report for this third *National Rivers and Streams Assessment* is written, data from your local waterbody will contribute to the regional and national picture of the condition of the nation's flowing waters.

If your local river or stream is not being sampled for this survey, it was not omitted for any particular reason except that it was not randomly selected or did not fit into the target population of flowing waters.

Many volunteer water monitoring groups have years of sampling data for rivers and streams, data vital to local water quality management activities. This survey will provide a regional and national – and in some cases, statewide – assessment. It will also allow those with sampling data for their local waters to compare the condition of their waterbody to the range of rivers and streams in their region.

What will researchers measure?

Field crews will take many measurements at each selected site. They use consistent procedures at all sites so that results can be compared across the country. They measure such things as:

- Temperature, dissolved oxygen, nutrients, pH, and more;
- Condition of the habitat along the river or stream banks;
- Algae attached to substrate;
- Benthic macroinvertebrates – small aquatic animals such as insects, snails, and crayfish that are a source of food for fish;
- Bacteria -- indicators of possible fecal contamination;
- Type and abundance of fish; and
- Mercury in fish tissue.

Field crew members record data for the National Rivers and Streams Assessment

Data for individual waters will be made available to the public using a national database as part of the final report on the condition of our rivers and streams.

What happens next?

Sampling will be conducted during the summers of 2023 and 2024. EPA intends to issue a report on the findings in 2027. Between the time sites are sampled and the national report is published, samples will be analyzed in the lab, the data will be entered into a database and analyzed, and a draft report will be written and reviewed. The public will have the opportunity to review and comment on the draft report.

For more information on the National Rivers and Streams Assessment, visit https://www.epa.gov/national-aquatic-resource-surveys

X. Silvicultural Proposals

COMPARTMENT 6 – Stands 0, 33, 34, 35, 36, 37, 38 and 39 **FY-26**

Gaswell Hardwood Thinning

Description / Resource Impact Assessment

Location: This proposal is located southwest of the terminus of Gaswell road and extends south to Interstate 68 and east to the forest boundary with private property near Amish road. The haul road will start at the end of Gaswell road, cross over private property for approximately 30 feet and continue onto an existing haul road into the western portion of the gaswell regeneration proposal directly adjacent to this stand. Haul road construction will be part of the contract and involve approximately 0.29 miles of haul road construction and improvements over an existing roadbed stopping at an existing landing located at the edge stand 28 in compartment 6. This proposed harvest along with the proposed gaswell regeneration harvest will utilize this existing landing. Approximately 0.28 miles of existing skid road will be utilized to transport harvested timber from the proposed gaswell regeneration and thinning harvests through stand 29 of compartment 6 to the existing landing.

Forest Community Type and Condition: This 110-acre site contains a medium sawtimber mesic oak stand that is approximately 86 years old with an average merchantable diameter of 15.0 inches. The overstory consists of northern red oak (69%), red maple (25%), chestnut oak (10%), white oak (6%) and scarlet oak (4%). The stocking in this stand is at 93% relative density with a basal area of 155 ft^2/acre and 344 trees per acre. The stand is currently overstocked with unacceptable growing stock (UGS) accounting for approximately 26% of the basal area. Desirable regeneration of competitive size is currently lacking due to a heavy sapling / pole canopy layer of undesirable stems and the tight canopy of the overstory trees.

Interfering Elements: Interfering understory plant competition is sufficient to cause complications in desirable regeneration efforts with a majority of the site containing some form of significant interference. This interference coupled with the dense canopy of the mature overstory trees and a well-developed mid story is significantly hindering desirable regeneration advancement on this site. Tall woody interference occupies approximately 69% of the stand, consisting primarily of sweet birch. Low woody interference occupies approximately 61% of the site, consisting primarily of huckleberry, blueberry and mountain laurel. Rhizomatous fern interference occupies approximately 16% of the stand and is not impacting regeneration to the extent that tall woody interference is.

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 shift in species composition dominated by undesirable tree species. Field evaluations of the site estimated deer browse impact to be moderate. Monitoring of deer browse impacts will coincide with regeneration inventories 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 area has not been harvested since state acquisition. The adjacent stand where the gaswell regeneration harvest is proposed

received a partial harvest in approximately 1985. A stand south of Interstate 68 was regeneration harvested in 2005 and another stand southeast of Interstate 68 was salvage harvested in 1997. No evidence of fire was observed during the stand inventory. Forest inventory in the summer of 2024 discovered that oaks in this stand were partially impacted by cankerworm defoliation in the spring of 2024

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: The management proposal contains no established HCVF areas. An 8-acre buffer (see map) of potential smokey shrew habitat in the northeast portion of this proposed harvest will be installed. Harvesting and heavy equipment will be excluded from this area.

Water Resources: This stand drains southeast into the North branch of the Casselman River within the Youghiogheny River Watershed. The proposed silvicultural treatments will be outside of all HCVF and stream buffer areas. A 50 foot no cut buffer with a crossing will be installed on the non-perennial drain that runs along the western boundary of this proposed thinning. 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 predominant soil type of this site is Cookport and Ernest very stony silt loams, (8 to 25%). This soil is moderately deep and moderately well drained of sandstone parent material with high erodibility. The site has good productivity for woodland management, with a site index of 75-85 for upland oaks. The productivity of the site will be protected by minimizing the haul roads and skid trails 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.

Management and Silvicultural Recommendations:

The proposed silvicultural treatment for this site is a commercial thinning given that competitive regeneration is hindered and the stand is overstocked. A crown thinning will be implemented, removing approximately 70 ft^2 of basal area per acre and reducing the residual basal area to 80-90 ft^2. Removals will be concentrated on all undesirable growing stock coupled with removal of half the acceptable medium sawtimber and 1/3 of the acceptable poletimber. Removals will create adequate canopy gaps and facilitate regeneration establishment in the understory. Estimated yield for the thinning is approximately 5,000 board feet per acre. Residual trees will benefit from the improved spacing post-harvest with increased vigor, growth rates and overall stand health. Retention will favor small and medium sawtimber trees of superior form and health to facilitate seedling establishment of the future stand. The process of the timber harvest should break the mid-story canopy and stems of undesirable tall-woody interference and afford additional sunlight to the understory and established regeneration which

is currently suppressed. Post-harvest monitoring will be conducted to determine if the present regeneration has responded to the thinning and if additional regeneration has established on the site. The long-term goal for the site is to have a desirable cohort of regeneration occupying the site when a final removal harvest is conducted to release the regeneration as the new stand of trees.

COMPARTMENT 6 – Stand 25 and 26 **FY-26**

Gaswell Regeneration

Description / Resource Impact Assessment

Location: This proposal is located south of the terminus of Gaswell road and extends south to Interstate 68 and east to the boundary of the gaswell proposed commercial thinning. The haul road will start at the end of Gaswell road, cross over private property for approximately 30 feet and continue onto an existing haul road into the western portion of the gaswell regeneration proposal directly adjacent to this stand. Haul road construction will be part of the contract and involve approximately 0.29 miles of haul road construction and improvements over an existing roadbed stopping at an existing landing located at the edge stand 28 in compartment 6. This proposed harvest along with the proposed gaswell regeneration harvest will utilize this existing landing. Approximately 0.28 miles of existing skid road will be utilized to transport harvested timber from the proposed gaswell regeneration and thinning harvests through stand 29 of compartment 6 to the existing landing.

Forest Community Type and Condition: This 42-acre site contains a medium sawtimber mesic oak stand that is approximately 78 years old with an average merchantable diameter of 17.4 inches. The overstory consists of red maple (46%), northern red oak (34%), other hardwood (7%) and sweet birch (6%). The stocking in this stand is at 83% relative density with a basal area of 137 ft²/acre. The stand was thinned in approximately 1985 leaving a residual overstory of northern red oak and red maple. Desirable regeneration is adequately stocked throughout this stand resulting from the post thinning light conditions which were conducive to the growth and development of mixed oaks and other desirable species with an estimated 599 competitive oaks, 1,740 established oaks, 3,516 new oaks, and 9,344 other desirable stems of regeneration per acre.

Interfering Elements: Interfering understory plant competition is causing competition impacts to regeneration throughout 75% of the proposed area. Tall woody interference occupies approximately 35% of the stand, consisting primarily of sweet birch, striped maple and witch hazel. Low woody interference occupies approximately 19% of the site, consisting primarily of blueberry, striped maple and sweet birch. Rhizomatous fern interference was noted to be a moderate issue affecting 50% of the site, but an adequate amount of desirable regeneration has already surpassed the height of ferns and smaller regeneration is surviving within the fern layer.

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 shift in species composition dominated by undesirable tree species. Field evaluations of the site estimated deer browse impact to be moderate. Monitoring of deer browse impacts will coincide with regeneration inventories to determine if additional measures need to be implemented to reduce deer herbivory and promote the advanced regeneration into the sapling stage.

Historic Conditions: This proposed harvest site was partially harvested in 1985. A stand south of Interstate 68 was regeneration harvested in 2005 and another stand southeast of Interstate 68 was salvaged harvested in 1997. No evidence of fire was observed during the stand

inventory. Forest inventory in the summer of 2024 discovered that oaks in this stand were partially impacted by cankerworm defoliation in the spring of 2024.

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: The management proposal does not directly border any areas that have been designated as High Conservation Value Forest.

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

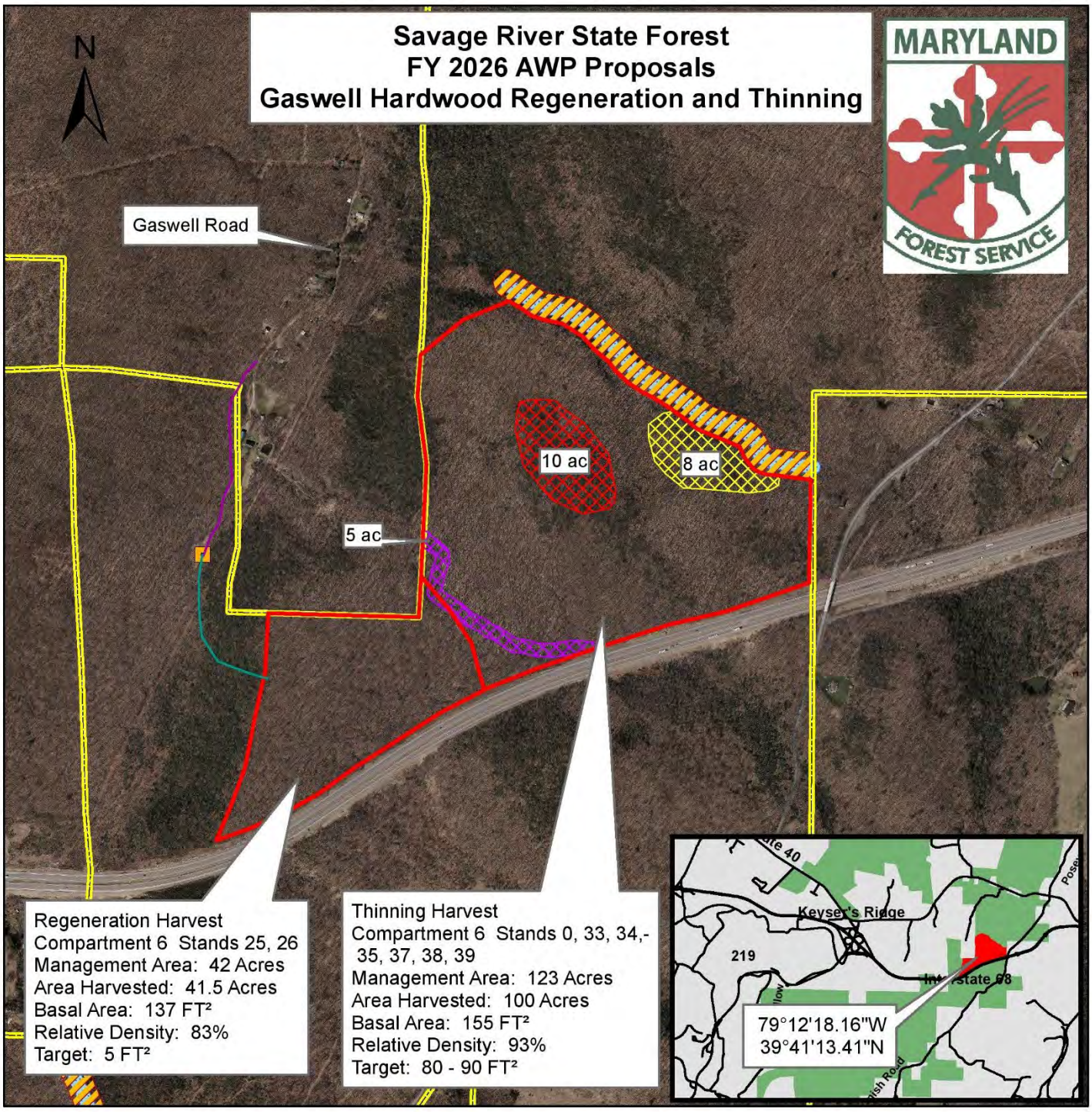
Soil Resources: The predominant soil types within this proposal are Very Stony Land, rolling (VsD) and Cookport and Ernst very stony silt loams, 8-25% slopes (CuD). These soils are moderately deep, well-drained and potentially highly erodible to highly erodible. The site has good productivity for woodland management, with an average site index of 65 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.

Management and Silvicultural Recommendations:

The proposed silvicultural treatment for this site is a regeneration harvest removing the majority of the overstory and at the same time removing any undesirable stems (striped maple and sweet birch) within the mid story. The abundance of established acceptable regeneration throughout this stand makes regenerating this stand a high priority. Desirable regeneration in the present size class and quantity will only persist while post thinning light conditions exist, as the overstory in this stand grows closer to closed canopy conditions the lower light conditions will lead to desirable regeneration mortality. The goal is to conduct a regeneration harvest on this while high quality regeneration is still present at adequate levels. The harvest should remove 7,000 board feet per acre while retaining 4-8 trees per acre to serve as wildlife habitat and a supplemental seed source. The targeted trees to be retained will primarily be oak species of good form coupled with stems that have cavities and habitat potential. The current mid-story will limit growth and establishment of desirable regeneration through competition and excess shade. The regeneration harvest should address this issue by cutting and/or smashing the birch and striped maple poles while removing the residual trees and at the same time retaining much of this pole material on the ground as shelter for seedling establishment.

Savage River State Forest
FY 2026 AWP Proposals
Gaswell Hardwood Regeneration and Thinning



Legend

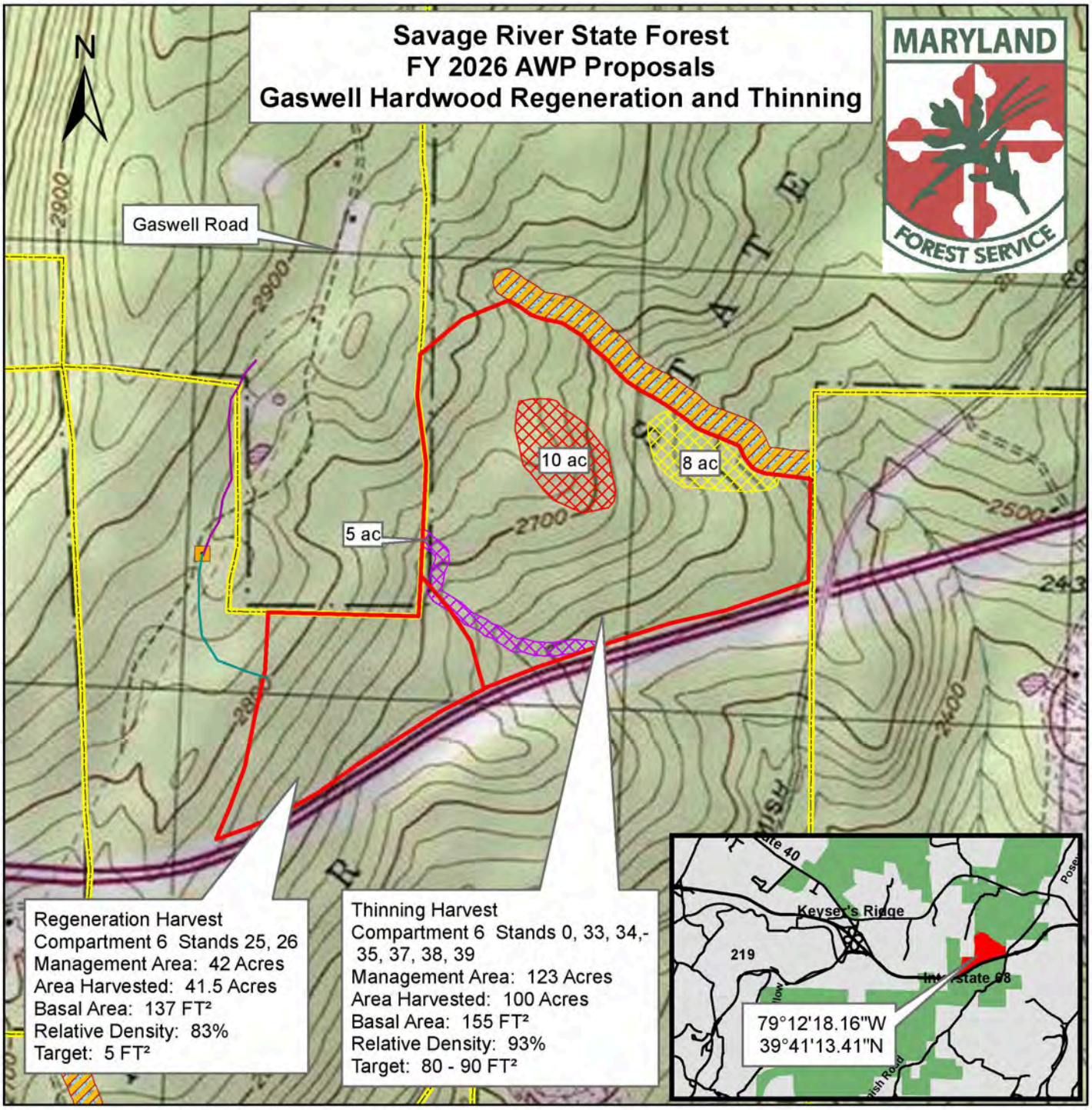
- Skid Road
- Haul Road
- Gaswell Road Harvests
- No Harvest
- Landing
- 50 Foot Buffer
- Shrew Habitat No Cut
- Savage River SF Boundary
- Irreplaceable_Natural_Areas
- Old Growth Ecosystem Area
- Ecologically Significant Areas
- Old Growth
- SRSF Wildlands
- streams and 50' buffers
- Wetlands of State Concern

MARYLAND DEPARTMENT OF NATURAL RESOURCES

1 inch = 1,000 feet

1:12,000

0 500 1,000 2,000 3,000 4,000 Feet



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MARYLAND DEPARTMENT OF NATURAL RESOURCES

1 inch = 1,000 feet

1:12,000

0 500 1,000 2,000 3,000 4,000 Feet

COMPARTMENT 9 – Stand 72, 39 and 66 **FY-26**

Bowman Hill North Regeneration

Description / Resource Impact Assessment

Location: This proposal is located approximately .87 miles north of Bowman Hill Road in Compartment 9 of Savage River State Forest. The harvest area is accessed by an established haul road known as Bowman Hill North. The haul road entrance is approximately 1.25 miles east of the intersection of Bowman Hill Road with Rabbit Hollow Road.

Forest Community Type and Condition: This 32-acre site contains a large sawtimber mesic oak stand that is approximately 90 years old with an average merchantable diameter of 17.4 inches. The overstory consists of northern red oak (80%), red maple (9%), sugar maple (3%) and black cherry (2%). The stocking in this stand is at 52% relative density with a basal area of 97 ft^2/acre. The stand was thinned in 2013 leaving a residual overstory of northern red oak, red maple and black cherry. Desirable regeneration is adequately stocked throughout this stand resulting from the post thinning light conditions which were conducive to the growth and development of yellow poplar and mixed oaks.

Interfering Elements: Interfering understory plant competition is sufficient to cause complications in desirable regeneration efforts with the majority of the site containing some form of significant interference. Tall woody interference occupies approximately 98% of the stand, consisting primarily of sweet birch, striped maple and witch hazel. Low woody interference occupies approximately 14% of the site, consisting primarily of sweet birch and greenbrier. Rhizomatous fern interference was noted to be a moderate issue affecting 48% of the site, but an adequate amount of desirable regeneration (>7,600tpa) has already surpassed the height of ferns in the understory.

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 shift in species composition dominated by undesirable tree species. Field evaluations of the site estimated deer browse impact to be moderate. Monitoring of deer browse impacts will coincide with regeneration inventories to determine if additional measures need to be implemented to reduce deer herbivory and promote the advanced regeneration into the sapling stage. Forest harvests have recently occurred around and near this proposed harvest area, the widespread browse and cover created by these other harvests should reduce deer browse impacts to this stand by expanding suitable browse across the landscape.

Historic Conditions: State Forest records indicate that the proposal area was thinned in 2013. The adjacent stand to the east was thinned in 2023. A stand to the northeast was thinned in 2020. The stand to the south was regenerated in 2020. No evidence of forest fire was observed during the stand inventory.

A canker worm outbreak in the late spring of 2024 led to the complete defoliation of this stand and portions of the surrounding stands. While this defoliation event is caused by a native forest pest, the complete defoliation will cause a tremendous stress on the effected trees and likely lead to mortality in trees with declining health. Trees that survive this stressor event will be more

susceptible to other forest pests and diseases leaving the future health of this stand in question. Immediately following this event, western Maryland experienced a severe drought that lasted through most of July. This drought stress coupled with the preceding canker worm defoliation resulted in only 60% of trees in this stand leafing out for the second time in 2024.

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: The management proposal does not directly border any areas that have been designated as High Conservation Value Forest. The closest area of concern would be the Little Bear Creek INA consisting of the riparian area encompassing Little Bear Creek located 730 feet west of the sale boundary.

Water Resources: This stand drains west 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 Forest Management Plan.

Soil Resources: The predominant soil types within this proposal are Dekalb and Gilpin, very stony loams 15-25% (DgD) and Dekalb-Calvin-Lehew, very stony loams 15-25% (DCD). These soils are well-drained and have a high potential for erosion on steeper slopes. Degree of slope ranges from 5-20% throughout the site. The site has good productivity for woodland management, with a site index of 65-75 for upland oaks. The productivity of the site will be protected by minimizing the haul roads and skid trails as per the Department's Best Management Practices and rutting guidelines.

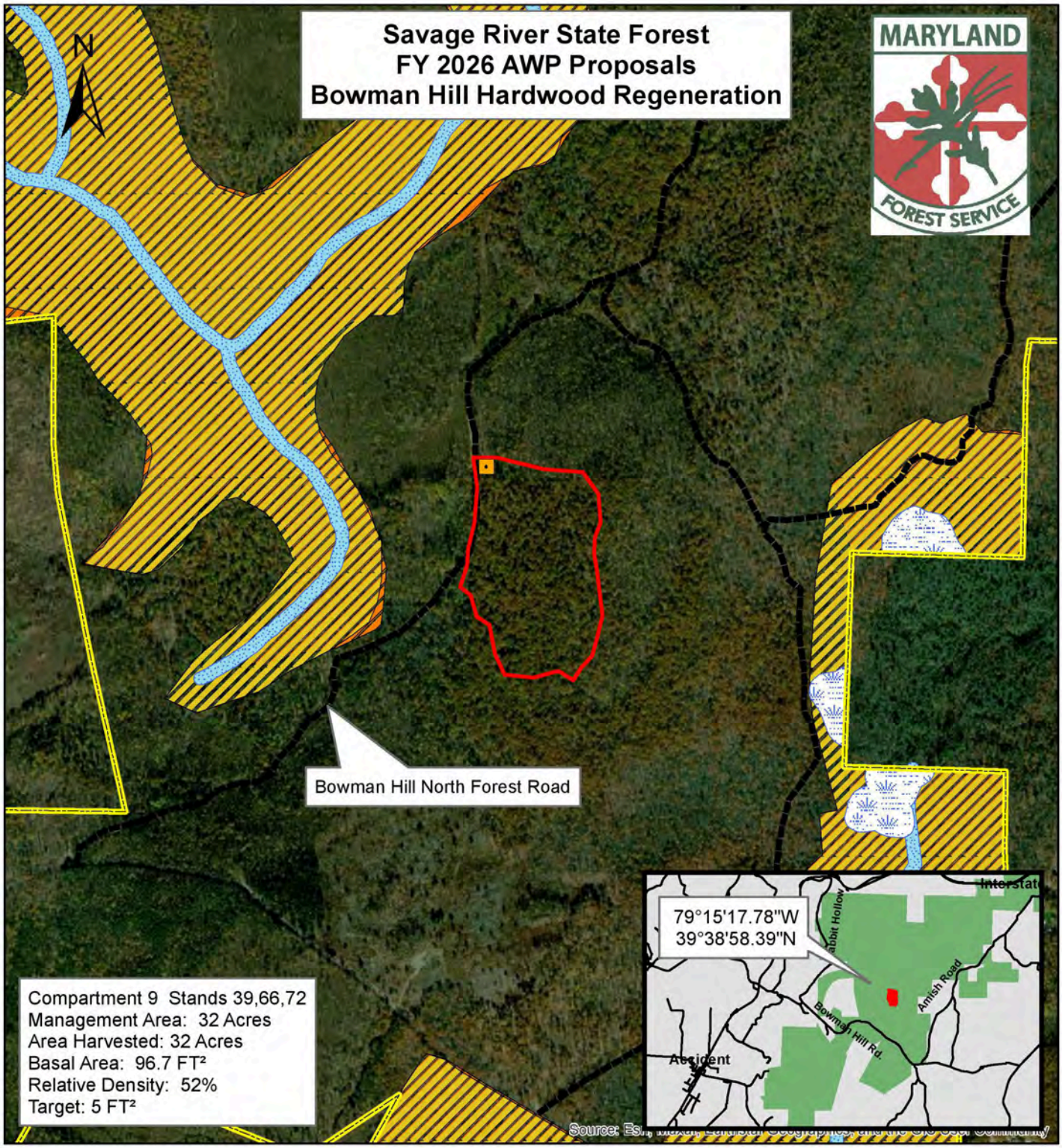
Recreation Resources: No developed recreational resources are located within the stand. The access road for the stand is primarily utilized for hunting access but also serves as part of the Bowman Hill Trail which can experience horseback and snowmobile users. It is unlikely the sale will be active in conjunction with snowmobile activities due to the distance to the county road. Signs alerting trail users will be posted along the haul road and at the trail parking lot to ensure the public's awareness of the harvest and associated truck traffic. Hunting opportunities may be disrupted for the duration of the harvest and access to the site may be limited depending on the timing of the harvest.

Management and Silvicultural Recommendations:

The proposed silvicultural treatment for this site is a regeneration harvest removing the majority of the overstory and at the same time removing any undesirable stems (striped maple and sweet birch) within the mid story. The abundance of established acceptable regeneration throughout this stand and recent forest health concerns makes regenerating this stand a high priority. Desirable regeneration in the present size class and quantity will only persist while post thinning light conditions exist, as the overstory in this stand grows closer to closed canopy conditions the lower light conditions will lead to yellow poplar and oak regeneration mortality. The goal is to harvest while these stressed trees still retain their value and while high quality oak and yellow poplar regeneration are still present at adequate levels. The harvest should remove 8,500 board feet per acre while retaining 4-8 trees per acre to serve as wildlife

habitat and a supplemental seed source. The targeted trees to be retained will primarily be oak and yellow poplar stems of good form coupled with stems that have cavities and habitat potential. The current mid-story will limit growth and establishment of desirable regeneration through competition and excess shade. The regeneration harvest should address this issue by cutting and/or smashing the birch and striped maple poles while removing the residual trees and at the same time retaining much of this pole material on the ground as shelter for seedling establishment.

Savage River State Forest
FY 2026 AWP Proposals
Bowman Hill Hardwood Regeneration



Compartment 9 Stands 39,66,72
Management Area: 32 Acres
Area Harvested: 32 Acres
Basal Area: 96.7 FT²
Relative Density: 52%
Target: 5 FT²

Legend

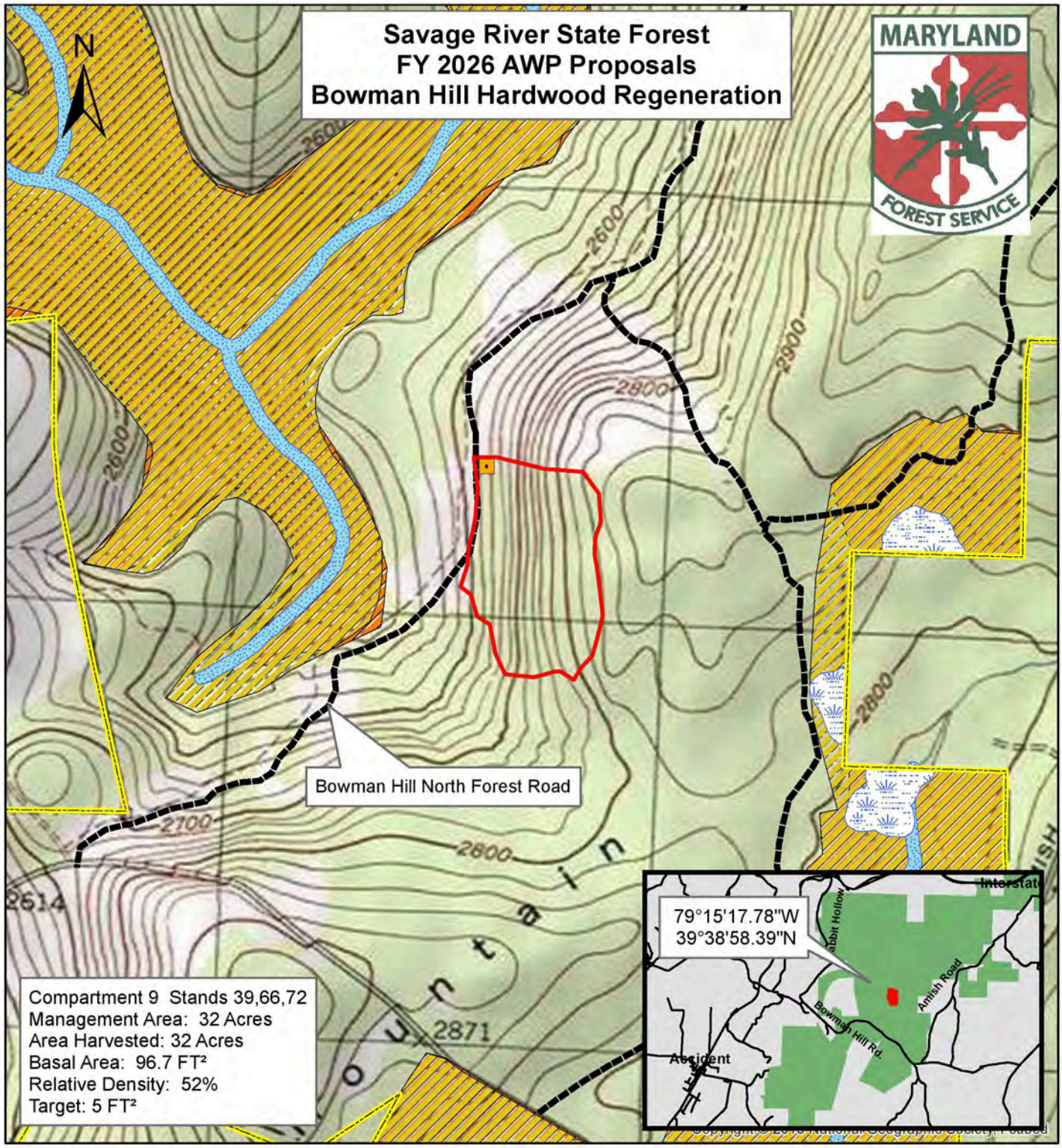
- Bowman Hill North Regen
- Landing
- Forest Roads
- Savage River SF Boundary
- Wetlands of State Concern
- streams and 50' buffers
- Irreplaceable_Natural_Areas
- Old Growth Ecosystem Area
- Ecologically Significant Areas
- Old Growth
- SRSF Wildlands

MARYLAND DEPARTMENT OF NATURAL RESOURCES

1 inch = 1,000 feet

1:12,000

0 500 1,000 2,000 3,000 4,000 Feet



MARYLAND DEPARTMENT OF NATURAL RESOURCES

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1:12,000

COMPARTMENT 16 – Stands 16, 17, 18, 19, 20 and 22 **FY-26**
Wolf Swamp Hardwood Thinning

Description / Resource Impact Assessment

Location: This harvest proposal is located to the east of New Germany road in Compartment 16 of Savage River State Forest approximately 0.2 miles south on New Germany road from the intersection of East Shale road and New Germany road. Access will be by way of an existing haul road running adjacent to New Germany road for a length of 0.4 miles to an existing landing.

Forest Community Type and Condition: This 121-acre site contains a medium sawtimber mesic hardwood stand that is approximately 79 years old with an average merchantable diameter of 14.2 inches. The overstory consists of red maple (40%), northern red oak (24%), Black Cherry (10%), sugar maple (8%), sweet birch (6%) and white oak (4%). The stocking in this stand is at 76% relative density with a basal area of 123 ft^2/acre and 255 trees per acre. The stand is currently overstocked with unacceptable growing stock (UGS) accounting for over 30% of the basal area. Desirable regeneration quantity is lacking due to a dense mid-story layer of undesirable tall-woody interference and the tight canopy of overstory trees.

Interfering Elements: Tall and low woody interference is limiting desirable regeneration across most of this stand. This interference coupled with the dense canopies of overstory and midstory trees is significantly hindering regeneration within the stand. Tall woody interference occupies approximately 93% of the stand consisting primarily of sweet birch, which hazel and striped maple. Low woody interference occupies approximately 49% of the site, consisting primarily of witch hazel, sweet birch and greenbrier. Rhizomatous fern interference was noted to be a smaller issue affecting 30% of the site likely due to the dense canopy of the overstory and mid story.

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 shift in species composition dominated by undesirable tree species. Field evaluations of the site estimated deer browse impact to be moderate. Monitoring of deer browse impacts will coincide with regeneration inventories 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 a 36 acre portion within this unit was salvage harvested in 1995. A 29 acre stand to the northwest was commercially thinned in 1999 and a 38 acre stand to the southwest was commercially thinned in 1995.

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: The management proposal does not contain any HCVF areas. A portion of the eastern boundary of the proposal borders the Poplar Lick Swamp ESA/INA. A 7.5-acre no-harvest buffer (see map) will be installed along the ridgeline at the northern portion of this proposed harvest. The buffer will protect an exposed rock bar which

has characteristics of potential Allegheny woodrat habitat and an associated 50 meter foraging area around the identified potential habitat.

Water Resources: This site drains southeast into Poplar Lick Run within the Savage River Watershed. The proposed silvicultural treatments will be outside of all HCVF 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.

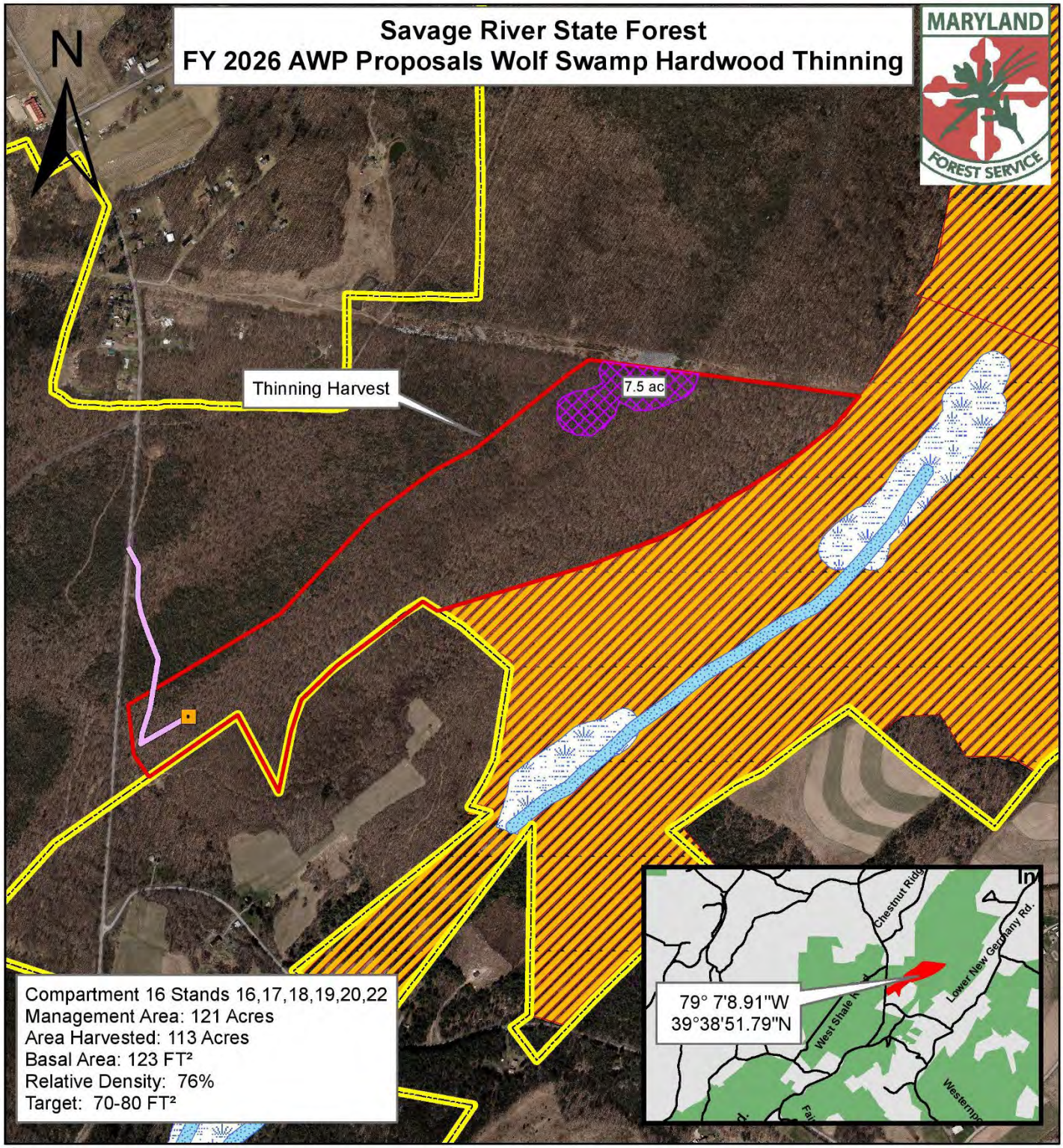
Soil Resources: The predominant soil types of the site are Very stony land, rolling (VsD), Stony land, steep (SrF) and Dekalb-Calvin-Lehew very stony loams, 0-15% slopes (DcD). The soils are composed mainly of sandstone parent material, moderately deep and well drained with high erosion potential The site has good productivity for woodland management, with an average site index of 55-65 for upland oaks. The productivity of the site will be protected by minimizing the haul roads and skid trails 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 and access to the site may be limited depending on the timing of the harvest.

Management and Silvicultural Recommendations:

The proposed silvicultural treatment for this site is a commercial thinning given the overstocked nature of this stand along with the high percentage of unacceptable growing stock. A thinning will be implemented, removing approximately 50 ft^2 of basal area per acre and reducing the residual basal area to 70-80 ft^2. Removals will be concentrated on all undesirable growing stock coupled with half of the acceptable medium sawtimber sized trees. Estimated yield for the thinning is approximately 3,000 board feet per acre. Residual trees will benefit from the improved post-harvest spacing with increased vigor, growth rates and overall stand health. Retention will favor small and medium sawtimber trees of superior form and health to facilitate seedling establishment of the future stand. The process of the timber harvest should break the mid-story canopy of undesirable tall-woody interference and afford additional sunlight to the understory and established regeneration which is currently suppressed. Post-harvest monitoring will be conducted to determine if the present regeneration has responded to the thinning and if additional regeneration has established on the site. The long-term goal for the site is to have a desirable cohort of regeneration occupying the site when a final removal harvest is conducted to release the regeneration as the new stand of trees.

Savage River State Forest
FY 2026 AWP Proposals Wolf Swamp Hardwood Thinning



Legend

- Wolf Swamp Thinning
- Landing
- 50 meter woodrat buffer
- Existing Road
- Savage River SF Boundary
- SRSF Wildlands
- streams and 50' buffers
- Wetlands of State Concern
- Irreplaceable_Natural_Areas
- Ecologically Significant Areas
- Old Growth Ecosystem Area
- Old Growth

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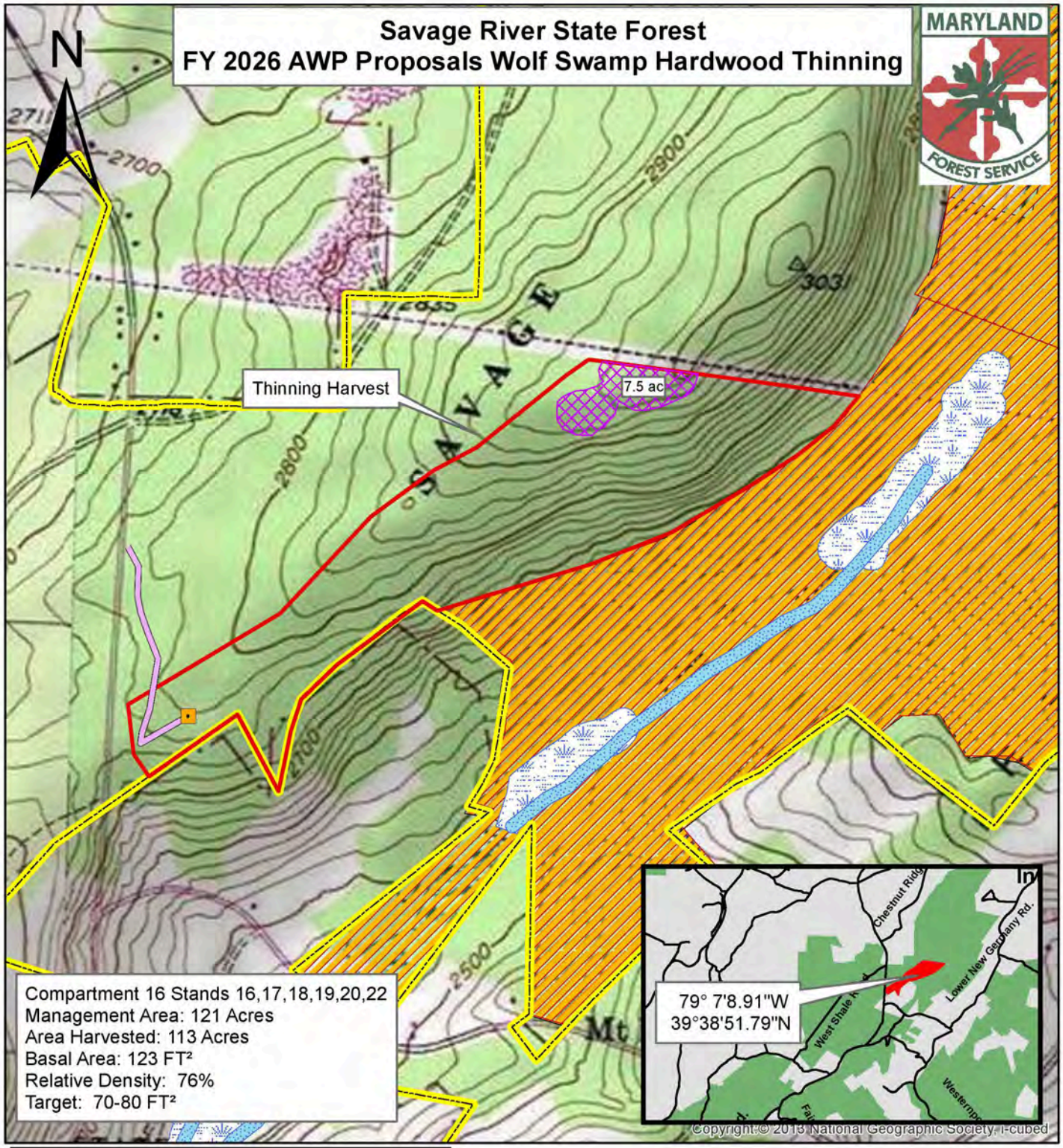
1:12,000

Savage River State Forest
FY 2026 AWP Proposals Wolf Swamp Hardwood Thinning



MARYLAND FOREST SERVICE

Legend

- Wolf Swamp Thinning
- Landing
- 50 meter woodrat buffer
- Existing Road
- Savage River SF Boundary
- SRSF Wildlands
- streams and 50' buffers
- Wetlands of State Concern
- Irreplaceable_Natural_Areas
- Ecologically Significant Areas
- Old Growth Ecosystem Area
- Old Growth

MARYLAND DEPARTMENT OF NATURAL RESOURCES

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0 500 1,000 2,000 3,000 4,000 Feet

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 $704,076.00. Of that amount, $435,717 goes to fund classified salaries and benefits for five employees; $176,820.00 funds four contractual employees and $91,539 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 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-2024.

B. SRSF Funding Sources: Estimated - *$704,076*

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 no active / open Recreational Trail Grant requests for FY25.

C. Operational Cost: Estimated Annual Expenses - *$704,076*

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-2025 budget proposal was prepared in August of 2023.

▪ *Classified Salaries, Wages and Benefits: $435,717*

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 along with our Western Region Trails Planner.

▪ *Contractual Staffing: $176,820*

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: $91,539*

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: 10-Year Timber Harvest Summary Table

Fiscal Year	*Planned Harvest*	*Bd. Ft. Vol. Harvested*	*Gross value*
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**
2020	**1,200,000 BD FT**	**1,161,591**	**$304,172.62**
2021	**1,200,000 BD FT**	**784,520**	**$289,280.00**
2022	**1,200,000 BD FT**	**1,354,237**	**$526,109.00**
2023	**1,200,000 BD FT**	**867,013**	**$271,150.00**
2024	**1,200,000 BD FT**	**1,484,455**	**$463,918.73**

Appendix 2: 2024 SFI / FSC Audit Summary

2024 Audit was held specifically on Chesapeake Forest Lands / Pocomoke State Forest, and conducted by Bureau Veritas Certification, Inc. 2025 will be their 2nd year and focus on western region's state forests.

2024 Audit Summary

Date of Field Evaluation: April 9-11, 2024.
Locations: Chesapeake Forest Lands and Pocomoke State Forest
Certificate Renewal Audit
Audit Team: Jim Colla (lead auditor), Sarah Bros and Raymond Lamberton

Sustainable Forestry Initiative Overview of Audit Findings:

An Observation for Improvement was issued for wood utilization resulting from an "excessive" amount of pulpwood, estimated at four or five loads, that was left on a log landing of an ongoing regeneration harvest:

Program or monitoring system to ensure efficient utilization, which may include provisions to ensure:

a) *management of harvest residue (such as slash, limbs, tops) considers economic, social and environmental factors (such as organic and nutrient value to future forests and the potential of increased fuel build-up) and other utilization needs.*

The area in question was cleaned up by the contractor and the OFI was closed during the 2025 audit.

Forest Stewardship Council Overview of Audit Findings:

A minor nonconformance was issued for herbicide usage without having a completed Environmental and Social Risk Assessment (ESRA) for the chemical Imazomox, an unrestricted selective herbicide used to control weeds and grass in clover plantings:

Before applying any chemical pesticide, incorporate the results of their ESRA to site operational plans, to identify site-specific risks and adapt the generic mitigation and monitoring measures previously identified in the IPM ESRA.
(Clause 4.12.2).

An ESRA was completed for Imazamox and posted to the DNR's pesticide webpage. The Minor Non-conformance was closed during the 2025 audit.

For copies of reports, visit (SFI) https://sfidatabase.org/org/maryland-dnr-forest-service and (FSC) https://search.fsc.org/en/certificate/a0240000005sUTnAAM/?tab=documents