

# State of the Forest

## Annual Report on Virginia's Forests


### 2021





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*Welcome to our State of the Forest annual report. It’s interactive! Follow the links to videos, more stories and additional information. The four categories shown below represent the VDOF mission priorities; stories are tabbed with applicable categories to provide additional context.*



*Published by the VDOF Public Information Office.*

*Janet Muncy, integrated media manager; Corydon Swift-Turner, public information specialist; Michelle Stoll, director of public information; Ellen Powell, conservation education coordinator; Cindy Frenzel, Project Learning Tree Coordinator; Jennifer Leach, programs coordinator*



## *From the State Forester*

After twenty years working at the Virginia Department of Forestry (VDOF), I am clearly biased in my impression of the work that we do. That being said, I think the accomplishments and the impact of the work done by the VDOF over the past year has been remarkable. Our highly qualified Incident Management Team (IMT) members continued to provide their unique skillset to the Commonwealth in response to COVID by helping to establish mass vaccination sites. Many of these same individuals also lent their talents to other states to fight wildfires and respond to other natural disasters. Throughout all the turmoil of the last year, VDOF staff have continued our important work here in Virginia helping landowners manage their forest, helping loggers protect water quality, helping partners plant trees, and all the other critical services we provide to ensure that Virginia’s trees and forests continue to provide all the benefits we rely on.

This year, we celebrated a milestone with the 50th anniversary of the Reforestation of Timberlands (RT) program. Virginia provided a model for other states with this innovative partnership between forest industry, government, and landowners that has ensured a sustainable pine resource. This year, Virginia launched another, even more ambitious partnership to improve the management of our hardwood forests and create much needed habitat for wildlife. We have also significantly increased our efforts to plant trees and establish forested riparian buffers to improve water quality and ultimately the health of the Chesapeake Bay. This includes more agency resources dedicated to tree planting in urban areas to protect water quality as well as addressing urban heat islands and the health impacts that come from the lack of trees in dense urban areas.

You can learn more about these efforts, and lots more, on the new agency website we also launched this year. I think VDOF launched everything but a rocket this year. We did launch a bunch of drones which are greatly increasing our productivity and safety. Thank you for reading this year’s State of the Forest report and please reach out if you would like to learn more.

Rob Farrell, State Forester of Virginia



Pause  
Plan  
Act



VDOF  
Website

## Focus on Hardwoods

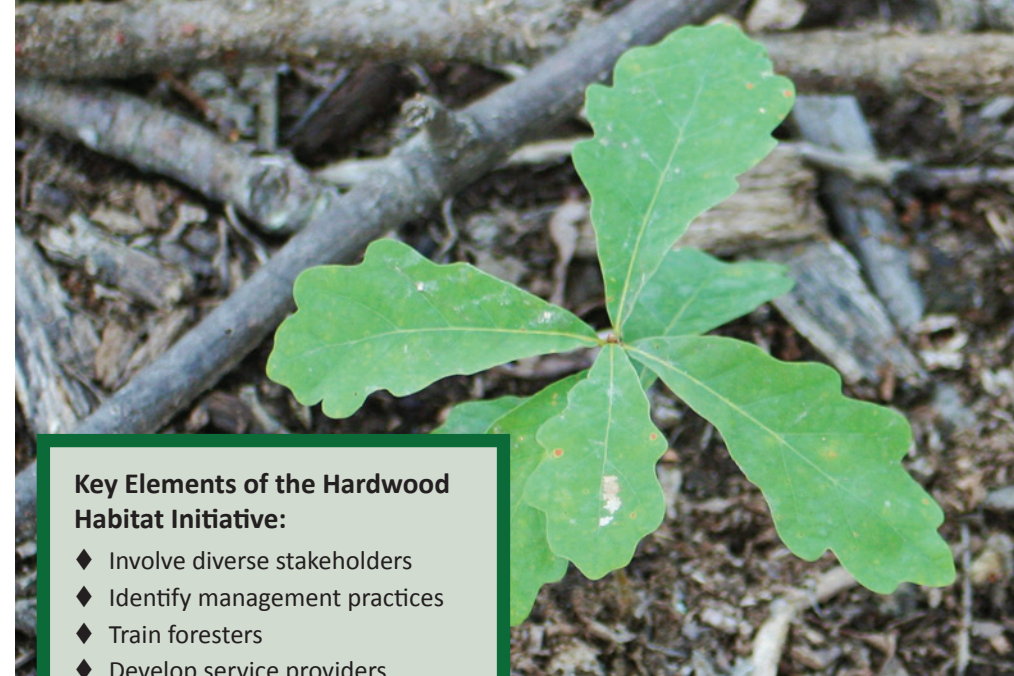
Virginia's forests are in a constant state of change. VDOF wants to make sure they change for the better. Hardwoods make up 79% of Virginia's forestland, providing raw material for an array of products, critical habitat for many plant and animal species, clean air and water, recreational spaces, and aesthetic beauty. But our hardwood forests are facing some challenges. Many forests are about the same age, and several factors – including heavy shade, deer, fire suppression, and invasive plants – are preventing them from regenerating desirable seedlings in the understory. Over time, the oaks and hickories we prize for their economic and ecological benefits are being replaced with other species.

Hardwood management involves many variables, and the regeneration and development of productive, valuable hardwood forests takes time and intentional management. VDOF, recognizing the need to act now to restore forest health, habitat, and future economic sustainability, embarked on its Hardwood Forest Habitat Initiative. A cornerstone of the initiative is the Hardwood Assessment Tool (HAT). The HAT is a process to evaluate and quantify hardwood stand conditions and recommend management practices that will improve them, while providing a consistent approach to support forest management decision making.

More than 30 VDOF foresters have attended HAT training to learn the assessment methodology. Eleven key practices have been developed, ranging from harvest and thinning recommendations to prescribed burning and invasive species control. To guide the agency's hardwood management efforts, VDOF recently hired a hardwood forest habitat initiative coordinator and is forming a steering committee.

To make sound practices economically feasible for both landowners and service providers, the agency proposed the Hardwood Habitat Incentive Program, and the Commonwealth dedicated \$350,000 this year. The new program is a cost-share opportunity that assists landowners in implementing beneficial hardwood management practices, and creates demand for contractors to do management work in hardwoods. The program is modeled after the Reforestation of Timberlands Cost-Share Program for pines, now celebrating its 50th year of successful pine management assistance.

The agency is working to establish demonstration sites on state lands to support future education and outreach efforts in support of resilient, productive, and sustainable hardwood forests.



### Key Elements of the Hardwood Habitat Initiative:

- ◆ Involve diverse stakeholders
- ◆ Identify management practices
- ◆ Train foresters
- ◆ Develop service providers
- ◆ Inform policies and incentives
- ◆ Educate landowners
- ◆ Build markets





Photo credit: Jack Mayer, Office of the Governor.

## Historic Stewardship Agreement Recognizes the Power of Collaboration

On September 24, Governor Ralph Northam, Natural Resources Conservation Service Regional Conservationist James E. Tillman, Sr., and USDA Forest Service Associate Chief Angela Coleman signed the Shared Stewardship Agreement at the newly dedicated Green Pastures Recreation Area in Clifton Forge, Virginia. Shared Stewardship creates a framework for state and federal agencies to work across boundaries and implement appropriate practices for healthy wildlife, sustainable forests, and clean water.

Shared stewardship promotes accountability with our partners to manage natural resources that are entrusted to us. These partnerships help us leverage resources to protect and develop healthy, sustainable forest resources for Virginians. Through collaboration and shared visioning, our forests will be more productive, healthy, and resilient on the landscape.

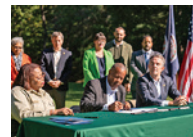
Virginia agencies like VDOF, the Department of Wildlife Resources, and the Department of Conservation and Recreation work together with federal partners to set landscape-scale priorities, implement projects at the appropriate scale, co-manage risks, share resources, learn from each other, and build capacity to improve forest conditions.

The USDA and VDOF have collaborated on the Virginia Interagency Coordination Center, forest health initiatives, water quality protection, urban and community forestry, and longleaf pine restoration. Working with and through each other helps ensure Virginia has healthy forests, healthy people, and healthy communities.

### Good Neighbor Authority Continues to Evolve

Modifications were added to the Good Neighbor Authority (GNA) – a part of the Shared Stewardship Agreement – to include project development on the Mount Rogers National Recreation Area and Warm Springs Ranger District.

These projects will involve additional timber sale layout and administration.



Governor Signs Shared Stewardship Agreement

## Reforestation of Timberlands Program Turns 50

Virginia's Reforestation of Timberlands (RT) program celebrated its 50th anniversary this year. The RT program is credited with ensuring a sustainable pine resource in the Commonwealth.

The RT program began in reaction to the 1966 Forest Survey, which documented that we were harvesting pine timber at a rate 15% higher than it was growing. In 1970, the state forester, pine industry leaders, and the Virginia General Assembly agreed on a plan to reverse this alarming trend. Forest industry agreed to pay a tax on timber harvested, and the tax revenue was matched by the Virginia General Assembly. Adopted in 1971, this funding formula established a statewide system to provide landowners with incentive payments to offset some of the cost of reforesting their pine timberland.

Since its inception, the RT program has provided nearly \$100 million to pine reforestation efforts. Virginia now grows nearly twice as much timber as is harvested each year, with much of that increase attributed to the RT program. Today's pines grow faster and produce better quality lumber. As they grow, they capture and store large amounts of carbon from the atmosphere, protect and improve water quality, and provide important wildlife habitat.

Conservation-minded landowners are a key to the RT program's success. In 1926, George Charles Beals purchased a Spotsylvania County property known as Oakley Farm. Mr. Beals had a love for trees, and he managed his property using the most modern forestry practices available. He passed along his dedication to conservation to successive generations. The Beals family participated the first year the RT program was available (1971), and have since planted and improved many acres of pine with the help of this program. This July, VDOF harvested an 86-foot loblolly pine from the first plantings, now a part of Oakley Forest Wildlife Management Area. The tree was hauled to a mobile sawmill where it was cut into boards to use for items commemorating the program's 50th anniversary.

The RT program continues to be one of Virginia's greatest forestry success stories. It also serves as a reminder of the value of public-private collaboration for the good of the Commonwealth's forests.



*Three generations of the Beals family and Department of Wildlife Resources staff.*



*Pine logs harvested from the 1971 RT project on Oakley Wildlife Management Area.*



*Phil Walker, Stanley Lumber and Land Corporation, speaks about the property.*



*Charlotte State Forest features more than 800 acres of wetlands.*

## Introducing Our Newest State Forest

In November, Governor Ralph Northam and Secretary of Agriculture and Forestry Bettina Ring joined VDOF and partners to officially open Charlotte State Forest, the most recent addition to the state forest system and Charlotte County’s first publicly-accessible land. The new state forest, which spans approximately 5,005 acres, will help maintain a stable local economy, provide recreational opportunities for the public, maintain wildlife habitats, and preserve water quality.

Charlotte State Forest also features 800 acres of wetlands, creating a biodiverse ecosystem that has been utilized for game hunting for decades. The land drains into Kerr Lake, which provides drinking water to nearly 500,000 residents in Virginia and North Carolina.

Located within the state’s highest timber producing region, the land that is now Charlotte State Forest was once owned by Thomas B. Stanley, who served as Virginia’s Governor from 1954 to 1958. Stanley Lumber and Land Corporation used the forest for the sustainable harvesting of shortleaf and Virginia pine, as well as white oak and hickory, which went to local mills for furniture.

In 2019, The Conservation Fund purchased the property. Subsequently, the Virginia Department of Forestry leveraged federal, state, and private funding through the USDA Forest Legacy Program, the federal Land and Water Conservation Fund, agency mitigation funds, the Virginia Land Conservation Foundation, and Virginia Outdoors Foundation.

The Virginia Department of Forestry (VDOF) manages approximately 74,286 acres across its 26 state forests. Virginia’s state forests are certified sustainable under the Sustainable Forestry Initiative (SFI) and American Tree Farm standards, and serve as models to demonstrate how sustainably managed forestlands can provide economic, environmental, and recreational benefits.



Charlotte State Forest Dedication Event



Learn About Virginia’s State Forests

# Planning for Generation NEXT

Most woodland owners hope their land will stay intact, in forest, and in the family. Unfortunately, land is most vulnerable to subdivision, sale, or land use change when it passes from one generation to the next. Fortunately, with proper planning and communication, families can realize better outcomes for the future of their land. Since 2008, Generation NEXT workshops have been helping owners protect their woodland legacy. Generation NEXT is a collaborative program of the Virginia Department of Forestry (VDOF) and Virginia Cooperative Extension (VCE). The program has won awards from VCE, Southern Wildland-Urban Interface Council, Southern Regional Extension Forestry, and Association of Natural Resource Professionals, as well as a Chesapeake Forest Champion Innovation Award from the USDA Forest Service and the Alliance for the Chesapeake Bay.

In 2020, the program launched a new resource to help families plan for the future of their forestland. [Legacy Planning, A Guide for Virginia Landowners](#), provides Virginia-specific support material for the Generation NEXT Legacy Planning Workshops. This guidebook gives woodland owners manageable steps to move through the legacy planning process, and it leads families through a 9-step process to help ensure everyone’s wishes for the land are met. The publication is designed specifically for private woodland owners and natural resource professionals.

Due to the Covid-19 pandemic, Generation NEXT workshops were not held in person last year, but VDOF and VCE partnered to offer the program virtually in April and September. The two-webinar series each consisted of four 1.5-hour sessions. At least 78 individuals participated, representing 44 families and 9,700 acres of farm and forest land. Participants indicated the program would increase the likelihood of their property staying intact (85%), in the family (73%), and in woodland (70%). In addition to the landowner sessions, training webinars were held for resource professionals from the Virginia Association of Soil and Water Conservation Districts, Virginia United Land Trusts (VaULT), and Southern Regional Extension Forestry (SREF).

VCE also created YouTube videos on Landowner Legacy Planning and Generation NEXT. The Landowner Legacy Planning videos are case studies on properties throughout Virginia, with the families that own them sharing their legacy planning stories. These videos are made to guide and inspire other landowners in planning the future of their land.



## Generation NEXT... An Award-Winning Program

- ◆ 2021 Southern Region Publication Award Winner from Association of County Agricultural Agents – Legacy Planning: A Guide for Virginia Landowners.
- ◆ 2021 Silver Award from Association of Natural Resource Extension Professionals. Book – Comprehensive Program Curriculum – Legacy Planning: A Guide for Virginia Landowners.

*Jennifer Gagnon, Virginia Forest Landowner Education Program Coordinator, shares how her family’s legacy planning fits into their overall goals in the video linked below.*



Legacy Planning, A Guide for VA Landowners



Determining Management Goals & Objectives





*Dead and declining sassafras trees along a field edge.*



*VDOF staff at laurel wilt disease training.*

## Laurel Wilt Disease

In June, Forest Health and Urban and Community Forestry staff held a training just across the state line in Sullivan, County Tennessee at a location where Laurel Wilt Disease (LWD) had been confirmed. Six VDOF foresters from surrounding counties as well as four Tennessee Division of Forestry staff attended this event, fostering collaboration across state lines. Attendees were able to learn about LWD biology, discuss how it spreads, observe symptoms on a number of impacted sassafras trees and see the treatment technique demonstrated in person. Shortly after this field day, LWD was confirmed on a sassafras tree in Scott County, the first detection in Virginia.

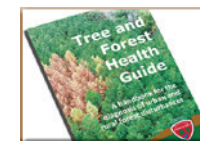
Laurel wilt disease (LWD) involves a pathogenic fungus that is spread by an ambrosia beetle. Both beetle and pathogen are non-native and are devastating species in the Lauraceae family throughout the Southeastern United States. In Virginia, species at risk are redbay, sassafras, and spicebush. Beetles carry the fungus within specialized mouthparts as they enter a healthy host species. The fungus colonizes xylem tissue, or water conducting cells, which causes a reaction that disrupts water movement in the tree. This causes tree decline and eventually tree death.



*Vascular streaking on an impacted sassafras tree.*

In deciduous hosts, symptoms include wilted, discolored leaves that drop shortly after infection. In evergreen hosts, foliage will turn brown but leaves will be retained by the trees. In all hosts, peeling back the bark will show brown streaking in the sapwood running with the grain of the wood.

If you think you have observed LWD in other areas of Virginia, please reach out to VDOF Forest Health staff for information on collecting samples for confirmation.



Tree and Forest Health Guide

## Emergency Management During a Pandemic

VDOF's Incident Management Team (IMT) personnel once again proved their success in the management of a statewide emergency incident through their coordination, oversight, and logistical support of the Commonwealth's Community Vaccination Centers (CVCs). This effort, now more formally named the Commonwealth of Virginia Incident Management Team (COVIMT), has provided a mechanism for the training and development of other Virginia response agencies in advanced emergency incident management. The VDOF team of incident managers, totaling 31 different individuals, provided more than 7,000 hours of assistance while maintaining their normal agency workload.

The adaptability and professionalism of VDOF personnel represents the finest in Virginia state government and a key foundational element in the success of Virginia's overall vaccination effort. A VDEM Planning Staff member stated: "We're very grateful for their support. Quite literally from day one of the COVIMT's formation and activation, they've (VDOF has) been an unwavering partner to the program. They provided the first six people in March 2020 who promptly put the team and response on a positive path forward. I like to share the story of Dave Milby, PSC, who facilitated a call in the morning, went and fought a fire throughout the day, and then facilitated the 1700 call that night. That's just one example of VDOF's adaptability as first responders and their concurrent desire to support the greater Commonwealth. I look forward to partnering with VDOF in future endeavors."

The success of VDOF's IMT highlights the impact that the specialized skills of one state agency can have in collaboratively sparking the success of numerous other state agencies, working toward a common mission, for the greater good of the Commonwealth. As the Commonwealth's primary agency responsible for wildfire control, VDOF employees have extensive experience managing large emergency incidents to protect our forest resources. VDOF's unique incident management skillset has expanded greatly over the years as the agency providing incident management experience to other state and federal forestry cooperators across the nation for all types of natural disasters. When confronted with the challenges that VDH and VDEM faced in managing the Commonwealth's vaccination effort, VDOF incident managers immediately stepped into action and adapted a proven skillset for use in managing state-level operations. The IMT's commitment and adaptability to an unfamiliar situation is nothing short of astounding.

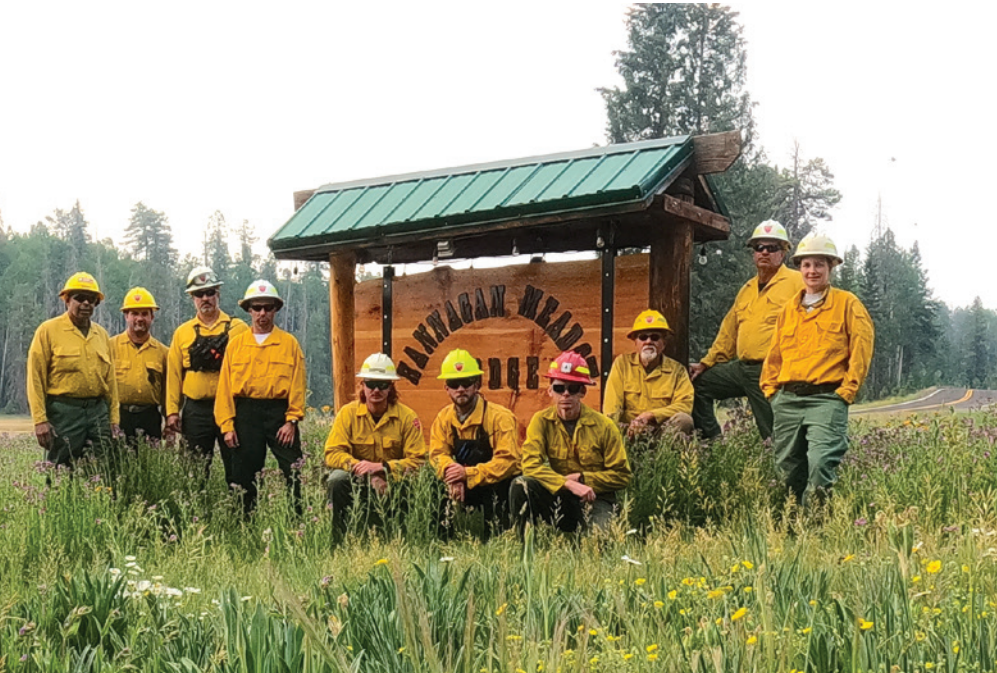


### Key Contributions of the VDOF IMT:

- ◆ Established 12 large Community Vaccination Centers (CVCs) and 106 Mobile Vaccination Sites.
- ◆ Developed 17 weekly Incident Action Plans (30+ page written documents outlining the overall vaccination work plan and operational assignments.)
- ◆ Completed 43 written Action Trackers (basically this is a multi-page "to-do" listing of action items needing to be accomplished to ensure critical item completion in support of the entire effort.)
- ◆ Created the CVC site tracker (Used to track the identification, vetting and certification of large CVC sites across the Commonwealth.)
- ◆ Developed the Concept of Operations (CONOPS) documents for VDEM's support of the statewide vaccination effort.
- ◆ Facilitated more than 100 planning and operation conference calls.
- ◆ Development of survey tool using Qualtrics software for initial vaccination site assessments.
- ◆ Provided operational support and follow-up site visits with local health districts.
- ◆ Developed functional job aides to support other agencies stepping in to fill similar IMT responsibilities during future statewide emergencies.



*Virginia crew deployed to Minnesota and Michigan took a boat to the fire each shift.*



*Virginia crew deployed to Arizona.*

## National Deployments

A primary mission of the Virginia Department of Forestry is to prevent and suppress wildfires throughout Virginia. In the last twenty years, VDOF response personnel have assisted with wildfire suppression in twenty-nine other states, coordinated hurricane response across the southeastern U.S. on nine different occasions, assisted with flooding response, downed aircraft incidents, and even helped to manage Space Shuttle debris collection following the Columbia disaster in 2003.

As a National Wildfire Coordinating Group (NWCG) member agency, the VDOF follows NWCG national guidance for the training and credentialing of VDOF wildland firefighters and incident managers. Following these guidelines helps to ensure that VDOF response personnel meet rigorous standards to not only help tackle any emergency here in the Commonwealth, but this level of expertise allows VDOF responders to volunteer for all-hazard response assignments across the United States.

National-level emergency response of wildfire resources is coordinated by the National Interagency Fire Center (NIFC). NIFC uses a system of regional coordination centers which are supported by state level coordination centers throughout the nation. The VDOF maintains a unique relationship with the Virginia Interagency Coordination Center (VICC), co-located in VDOF's Headquarters Command Center in Charlottesville. Having this close tie to national level response provides unique opportunities for VDOF responders with the interest to serve in the response to some of the nation's largest disasters.

In most cases, VDOF incident managers use their available vacation time to take out of state deployments through the VICC, with an interest to build their emergency credentials while also earning some additional income. For the VDOF, employees are allowed to take these assignments outside of Virginia's normal spring and fall wildfire seasons and are managed so as not to place an undue burden on the local work area in terms of maintaining the normal VDOF agency business. Any agency-related expenses that might occur to the VDOF are fully reimbursed as part of the process.

# VDOF Launches New Website

VDOF is beyond excited about its new website launched in May 2020!

Throughout the development of this new website, the agency focus was always you – our audience – the landowners, partners, loggers, educators, firefighters, agencies, organizations, forest lovers, and citizens of the Commonwealth. The agency aimed for a much-improved site with the most important forestry information available and easily navigated.

This new website provides the agency a useful tool for outreach and sharing information with the public, as well as allowing visitors to find needed information more easily. Special care was given to provide many helpful features and tools, among which are:

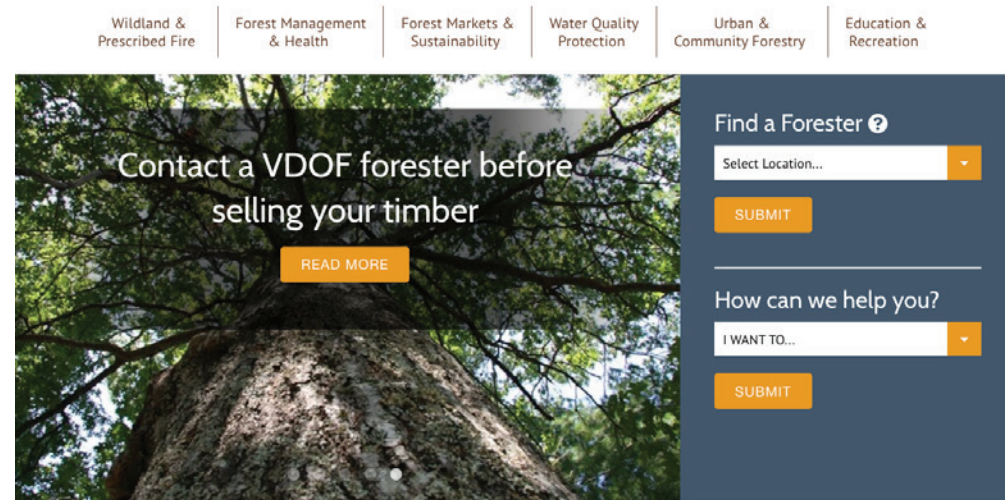
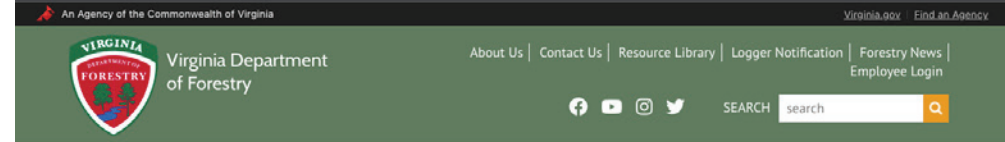
- ◆ An organized [home page](#) with our most needed information easily found and navigated;
- ◆ Robust menus to facilitate navigation to needed information;
- ◆ A [“Find a Forester”](#) search to help connect landowners directly with their local VDOF forester;
- ◆ A robust, searchable [resource library](#) of all publications, forms, templates, maps, and more – accessible from throughout the website;
- ◆ A searchable [agency directory](#) to help connect the public with appropriate VDOF staff;
- ◆ A searchable, self-service [business directory](#) for consulting foresters, loggers, and other forestry service providers to help connect landowners with forestry businesses;
- ◆ An interactive [State Forest](#) map offering consistent and complete state forest information;
- ◆ An integrated blog to help visitors keep up with [forestry news](#); and
- ◆ A robust Search engine to help visitors find needed information.

Along with the information for the public, we’ve also integrated our employee Intranet within the site making internal resources more readily accessible to VDOF employees in accomplishing their daily tasks in serving the public.

Thank you to all who assisted in building and testing the site, and for the continued feedback to help our site remain relevant and current. All indications are that the new website is a resounding success! The first month of launch indicated 5,650 visitors and by October, visitors reached 41,146 and growing.



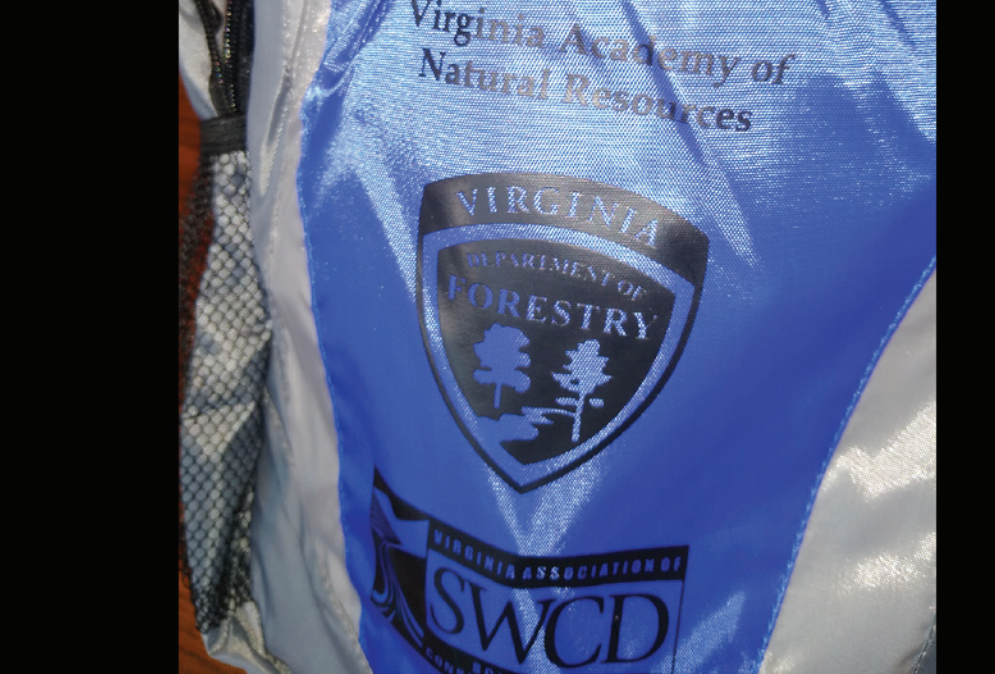
VDOF Website



## Forest Health Team ComBATS Emerald Ash Borer

Ash wood – traditionally used in the making of baseball bats – are threatened by the emerald ash borer. Our best defense against the emerald ash borer is education and outreach – getting the word out to landowners about how they can help protect their ash trees.

All in the name of saving our ash trees – VDOF partnered with three minor league baseball teams: the Salem Red Sox, Norfolk Tides, and Richmond Flying Squirrels. VDOF staff and Smokey Bear attended one Red Sox game to distribute outreach material to the 2,445 fans. Social media posts on team accounts reached 108,404 people throughout the season, with 46,413 engagements. Ash bat giveaways via the Flying Squirrels social media accounts are ongoing, but graphics were displayed on their video board during home games at which there were a total of 275,000 attendees throughout the season.



## Summer Camp Goes Virtual

Last winter, the state of the pandemic made planning an in-person summer camp risky. But for VDOF conservation education coordinator Ellen Powell, a second year without Camp Woods and Wildlife was tough to swallow. Over at the Virginia Association of Soil and Water Conservation Districts, education coordinator Bonnie Mahl was having the same qualms about missing Youth Conservation Camp. The solution was a partnership. The result was the Virginia Academy of Natural Resources (VANR).

A team of VDOF and SWCD staff worked together over several months to create a virtual week of natural resources education for high school students. The goal of VANR was to build teens' knowledge of Virginia's natural resources and introduce them to career paths, through online learning, interaction, and independent study.

Twenty-eight enthusiastic "campers" from around the state participated in this hybrid learning opportunity in July. From Monday through Thursday, students attended online morning presentations related to a daily theme: aquatics, forestry, soils, or wildlife. In the afternoons, they had a choice of additional videos and readings, plus a field assignment related to the day's theme. Each participant received a backpack full of field study materials and instructions for completing daily individual assignments. These activities ranged from soil analysis to tree identification, and from water testing to wildlife observation. Students completed their studies in their location of choice - backyard, woods, or local park.

Students were grouped by region and met each morning with "counselors," consisting of VDOF and SWCD staff. These adult facilitators led the students in debriefing the previous day's at-home field studies. For a week-long project, the groups also discussed natural resource challenges in their area of the state and put together a slide show to present on Friday. And, just for fun, students finished the week with a mock Envirothon competition.

The Virginia Academy of Natural Resources was a hit with the students, who not only learned a great deal, but also formed friendships within their groups – just as they would have at an in-person camp. The top three descriptive words generated in a word cloud at the end of the week were fun, informative, and inspiring! The event also served as a model for interagency collaboration, demonstrating the success of agencies working together toward a common goal of teaching the next generation of environmental stewards.



## Urban Forestry Heats Up

When it comes to mitigating the effects of climate change, trees are a big part of the answer. Among other benefits, trees provide cooling shade and act as filters to improve air quality. Nowhere is this truer than in cities, where heat-absorbing concrete and asphalt can make temperatures soar ten or more degrees higher than surrounding areas, and where engine exhaust releases air pollutants hazardous to human health. To make matters worse, past urban planning decisions often left predominately working class and minority neighborhoods with fewer trees and green spaces.

This year, VDOF's Urban and Community Program (U&CF) both participated in and partially funded a study of urban heat islands across the state. This project was led by the Virginia Foundation of Independent Colleges (VFIC). Other partners included the Science Museum of Virginia and Capital One, in addition to VDOF. "Heat Watch," conducted on the same day in eleven Virginia cities, was the largest study of its kind in the country.

On July 15, college students, faculty, and other volunteers attached temperature sensors to their cars and drove predetermined routes through the cities, covering an area of more than 300 square miles. Temperature readings were taken at 6 AM, 3 PM, and 7 PM, to reveal variations throughout the day and allow comparisons among different parts of the cities. In the Richmond study area, the sensors also measured concentrations of an airborne pollutant known as particulate matter, a mixture of microscopic particles that has been linked with cardiovascular and respiratory diseases.

The Heat Watch project gave students an experiential learning experience with real-world applications. The data the volunteers collected will help determine which sections of the cities are most vulnerable to heat. This information will be used by the cities to inform future policy, planning, and tree planting projects. University faculty will use the data in future classes and student projects. The project also serves as a model for other states wishing to complete surveys of this magnitude. Perhaps most importantly, it raises community awareness of the urban heat island effect and encourages the creation and maintenance of green spaces in cities.



Citizen Scientists Map Extreme Heat



*Many partners (Virginia Department of Forestry, Virginia Foundation of Independent Colleges, Science Museum of Virginia and Capital One) and hundreds of volunteers came together to make this Heat Watch project a success.*



Richmond Participates in Heat Mapping



UR Student Research - Heat Mapping



## Eleventh Forest Inventory Underway in Virginia

*More than 80 years of research to help manage our forests*

When you read the forest statistics found in the State of the Forest report, do you ever wonder where information such as the number of acres of forestland and the most common forest type comes from? In many cases, the source is the Forest Inventory and Analysis (FIA) program. FIA field crews put boots on the ground to collect forest resource information.

### A Bit of History

By the early 20th century, much of the virgin forestland of the Upper Midwest, Southern Appalachians and southern longleaf pine forests had been harvested. Nationally, there was concern that a “timber famine” might be coming.

In 1928, Congress passed the McSweeney-McNary Act, creating a national Forest Survey to assess the condition of the forest resource. The USDA Forest Service’s research branch was tasked with conducting these surveys. The first Forest Survey of Virginia was published in 1940, with subsequent reports in 1957, 1966, 1985, 1992, 2001, 2007, 2011, and 2016.

Some of these reports had a significant impact on forestry in Virginia. For example, the 1966 Forest Survey report identified the issue of the pine resource being over-harvested in the Commonwealth. This concern directly led to the creation of the Reforestation of Timberlands Act – which has had a tremendous impact on increased pine planting and management in the Commonwealth over the past 50 years.

In the late 1990s, there was a significant shift in the way the Forest Survey – now called Forest Inventory and Analysis – operated. Needing more current information to make resource management decisions, the state forestry agencies in the South began partnering with the USDA Forest Service Forest Inventory and Analysis program (VDOF was one of the first), with the states providing the field personnel and the USDA Forest Service providing the structure, processing and reporting. Now, rather than a published report every 7-9 years, there is an annual update posted online, with a more comprehensive report – such as [Virginia’s Forests, 2016](#) – published every 5 years.



Virginia’s Forests, 2016

The FIA program's scientific data collection provides much more than a snapshot in time. Forest data illuminates trends and issues that inform forest management and policy decisions.

### How does FIA collect data?

The FIA program monitors approximately one plot per 6,000 acres (roughly 3 miles apart), with around 5,000 total plots in the state. The plots run the gamut of Virginia's landscape: public- and privately-owned lands; backyards and remote wilderness areas; young pine plantations and older hardwoods; open park-like stands and brush-choked understories; swamps and steep slopes; recent cut-overs and mature stands. Twenty percent of the plots in each county are re-measured annually, to provide an update on the condition of the forest resource.

FIA field crews are typically made up of one or two people. For each plot, they collect data on land use, ownership type, forest type, stand age, any disturbances or harvesting, invasive plant species, site productivity, and other factors. For individual trees on tally, they record information such as location, species, diameter, crown characteristics, bole quality, tree grade, length of trunk, and damages.

The use of GPS is a huge help in locating these forest inventory plots. While most plots are simply accessed by driving into the vicinity and hiking in, reaching others can be more complicated. For example, some Great Dismal Swamp National Wildlife Refuge plots require the use of a boat or canoe, and other parts of the state require extensive off-road driving or an ATV. In addition to the typical brush and steep slopes, crews accessing plots in western VA may have to navigate around cliffs, as well as strip mine high walls on the Cumberland Plateau.

### Employee Spotlight

Ryan Hewitt, one of VDOF's FIA specialists, offered his perspective on field work:

"I often get asked by other forestry professionals what it's like being an FIA forester and "doing the same thing, day after day." The truth is, it is the same every day but your office is constantly changing. One day I might be driving 3 miles behind a gated Forest Service road and having to cut trees out of the road to reach a stand of 150-year-old chestnut oaks, while the next day I could be digging around stumps in a fresh cutover trying to locate tagged stumps in order to find the metal pin that marks our plot center location. It's that change in scenery that



*Working FIA means getting to the plot by any means necessary.*

keeps my job fresh and fun. Yes, the measurements are the same from plot to plot, but the different areas you see and the people you meet have kept me in this position for a little more than 13 years now.

Some of us FIA "ninjas," as we are called by some other VDOF employees, joke that a normal day in the woods for us is something that people working in a big city high rise would pay to be able to do on a weekend. Driving rough, rocky roads, navigating rock outcrops, and crossing streams only to park the truck and then hike through the woods is something we do on a daily basis for work, while others long to do the same thing on a weekend excursion. Plenty of times, I have found myself on ridgetops with amazing views, and I think to myself, "This is a pretty good job, getting paid to do and see these things that most people never get to experience."





## Protecting Water Quality

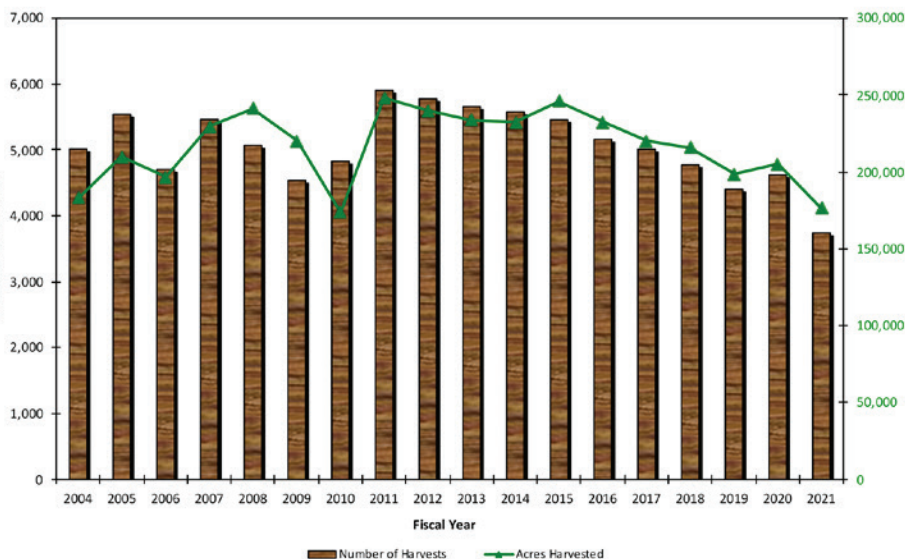
Forests are vital for preserving and improving water quality; in fact, forest conservation is one of the most effective measures to protect our water resources. The Virginia Department of Forestry (VDOF) is tasked with promoting and enforcing the Virginia Silvicultural Water Quality Law (Code of Virginia §10.1-1181.1 through §10.1-1181.7), as well as developing best management practices (BMPs) for forest harvesting operations, and working cooperatively with agencies and landowners throughout the Commonwealth to manage and preserve riparian buffers and protect water quality.

Studies have shown that the cleanest water comes from forested watersheds. These watersheds are critical sources of pure drinking water, they provide habitat for important fisheries and wildlife and are treasured for their recreational value and contributions to our quality of life. This is especially important when considering the Total Maximum Daily Load (TMDL) and Watershed Improvement Plan (WIP) developed for the Chesapeake Bay. Two of the Virginia Department of Forestry's (VDOF) performance measures involve water quality. One focuses on Best Management Practices (BMP's) of forest harvesting operations and protecting streams from sediment. The other focuses on protecting and improving watersheds through forest management and land conservation.

VDOF has played an important role in the protection of our forested watersheds since the early 1970s when the first set of Forestry BMPs for Water Quality were developed. The Department utilizes the fifth edition of those guidelines that was published in 2011. The backbone of the Department's water quality efforts is the harvest inspection program that began in the mid-1980s. This program provides one-on-one contact between VDOF staff and the harvest operators and offers unique opportunities to educate the operators about BMPs and the latest

techniques in water quality protection. During FY21, VDOF field personnel inspected 3,742 timber harvest sites across Virginia. These inspections included 16,667 site visits (an average of 4.5 visits per site) on 176,213 acres – a decrease in both the number of harvests and the number of acres harvested from the previous year likely due to the Covid-19 pandemic.

**Timber Harvests in Virginia  
(2004-2021)**



**16,667  
Site Visits**

**on 3,742 Harvests**

## Logger Education

Logger education is another key focus area of the VDOF water quality program. Since the development of the first BMP Manual for Virginia, VDOF staff have helped provide harvesting contractors with water quality protection training ranging from harvest planning and map reading, to using GPS units to implement forestry BMPs. This training is offered through agency-sponsored events as well as through the agency's participation in the Sustainable Forest Initiative SHARP (Sustainable Harvesting and Resource Professional) Logger Training Program. Since 1997, the SHARP Logger program has allowed VDOF to help train 10,689 harvesting professionals who have participated in 355 programs related to water quality protection. During FY21, 8 training programs were offered with a total of 372 participants. This is extraordinary given the constraints working around the Covid-19 pandemic.

In July 1993, the General Assembly, with the support of the forest industry, enacted the Virginia Silvicultural Water Quality Law, Va. Code §10-1-1181.1 et seq. The law authorizes the State Forester to assess civil penalties to those owners and operators who fail to protect water quality on their forestry operations. Virginia is the only state in the southeastern United States that grants such enforcement authority to the state's forestry agency. During FY21, the VDOF handled 108 water quality actions initiated under the law; a decrease of 10% from FY20. Of these actions, two resulted in a Special Order being issued and no Emergency Special Orders (Stop Work Orders) were issued for violations of the law. There were also 15 Failure to Notify violations.

A statewide audit system has been in place since 1993 to track trends in BMP implementation and effectiveness. Results from calendar year 2020 data showed that the statewide BMP harvest median implementation rate of 240 randomly selected tracts was 95%; the harvest median score is the best judge of central tendency of the tract score. The audit results also showed that one site (0.42%) of the sites visited had active sedimentation present after operation close-out. The information compiled using this audit process forms the basis of reporting for the Watershed Implementation Plan in response to the TMDL for the Chesapeake Bay. Since the information is captured through GIS technology, this information is compiled spatially for reporting those forestry operations occurring within the Bay watershed boundaries. For calendar year 2020, the BMP implementation



rate harvest median score for forest harvesting within the Bay watershed was 95.5%. The entire BMP implementation monitoring effort has been automated over the past several years to be compatible with VDOF's enterprise database system known as IFRIS (Integrated Forest Resource Information System), and field data collection tablets are used to facilitate accurate data entry.

## Watershed Protection

Because forests provide the best protection for watersheds, increasing the amount of forestland conserved, protected and established in Virginia's watersheds is one of the Department's goals. This goal focuses on practices that will benefit water quality the most; specifically, guarding water quality on land that is permanently protected by a conservation easement; establishing and maintaining riparian buffer zones; planting trees on non-



Clean Water  
Grows on these  
Trees

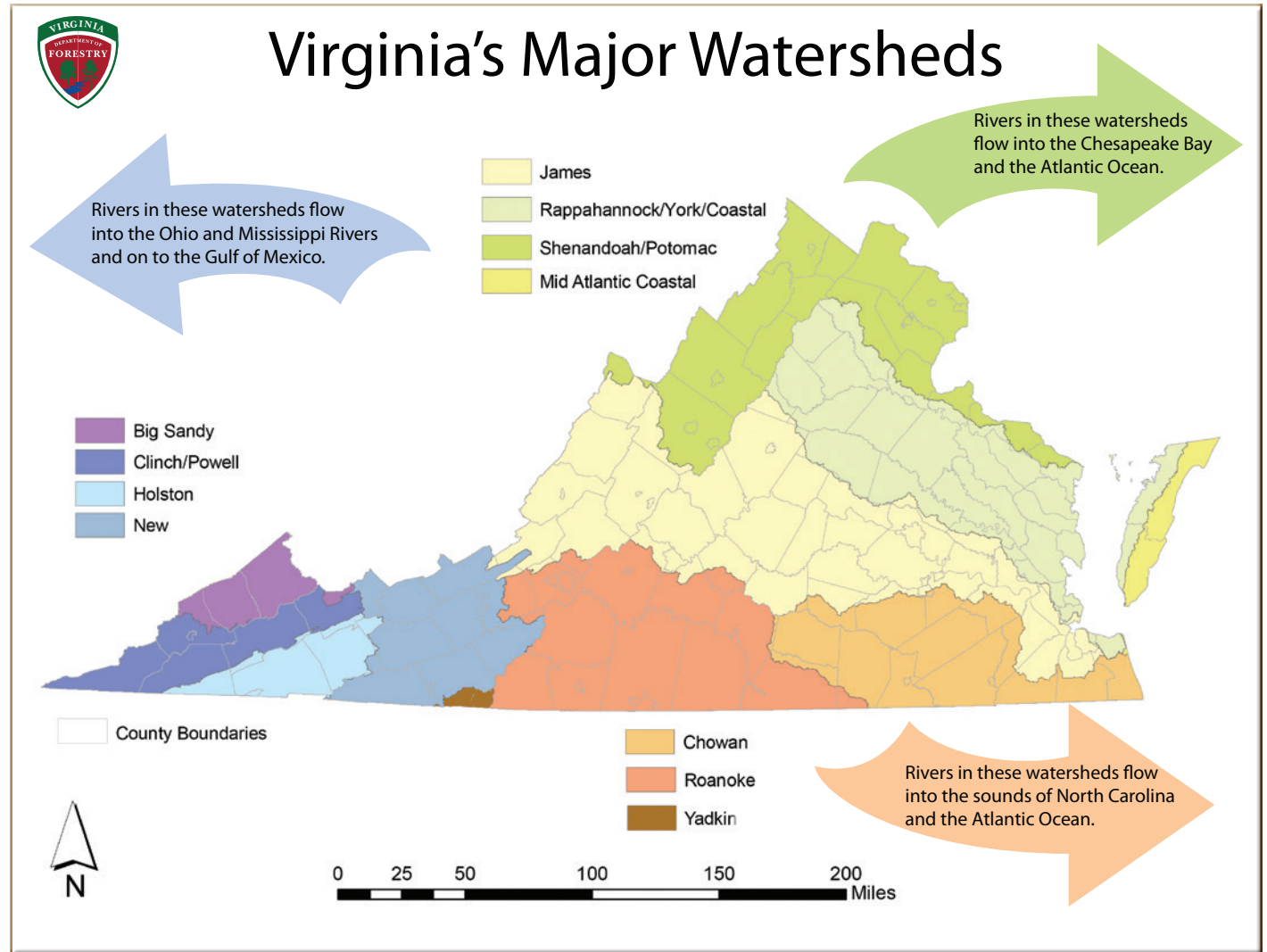


BMP  
Implementation  
Report

*Protecting Water Quality, continued...*

forested open land; and increasing the urban forest canopy by planting trees. All of these activities are closely related to meeting water quality goals associated with Virginia's southern river watersheds and the Chesapeake Bay restoration. FY21 proved to be an active year for the VDOF easement program, as the agency reviewed harvest plans and inspected for BMP compliance on 17 VDOF-held easements.

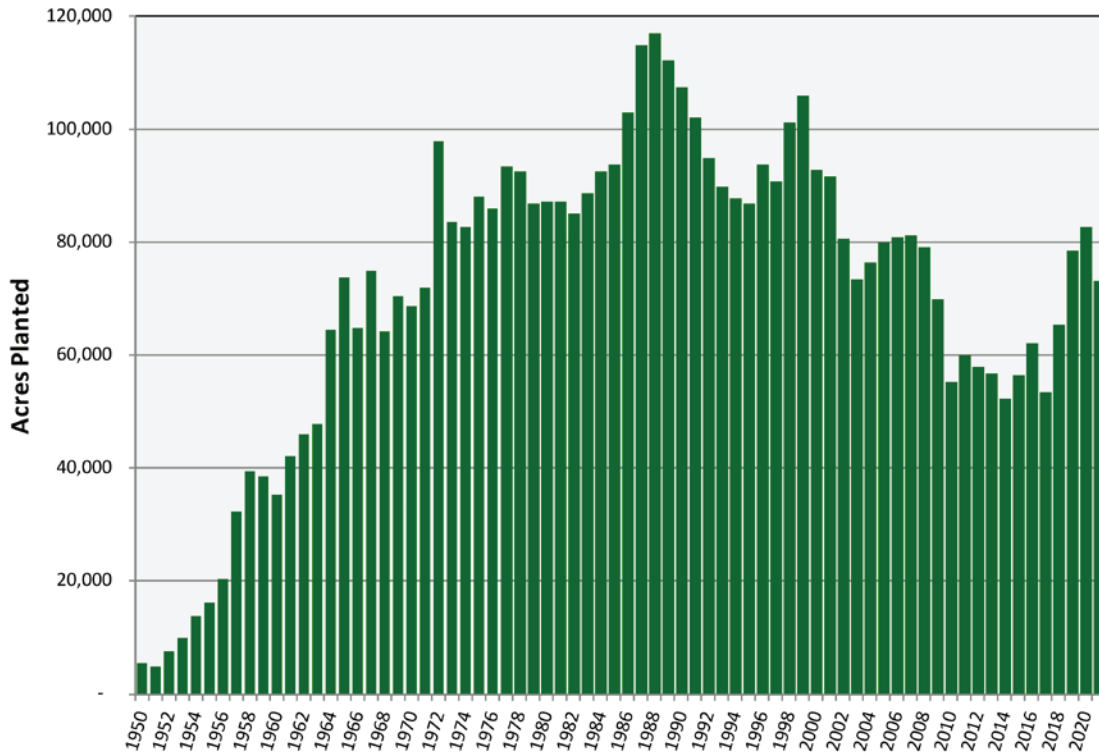
Virginia's forestry BMPs that address harvesting have been highly successful. One of the most valuable BMPs for water quality is the uncut or partially cut streamside management zone. This voluntary measure assures an unbroken forest groundcover near the stream, provides shade for water and preserves wildlife corridors. Landowners can elect to receive a state tax credit for a portion of the value of the uncut trees in the buffer. By doing so, they agree to leave the buffer undisturbed for 15 years. The number of landowners electing this option in Tax Year 2020 was 88, providing protection on 1,388 acres of riparian forest. This watershed protection option provided a tax credit of \$599,041.63 on timber retained in the streamside riparian areas and valued at \$2,628,839.31.



VDOF also provided assistance to the USDA Farm Service Agency in promotion of the Pandemic Assistance to Timber Harvesters and Haulers program (PATHH). This program provides financial assistance to harvest operators and haulers that were impacted during the Covid-19 pandemic in terms of a reduction in gross receipts.

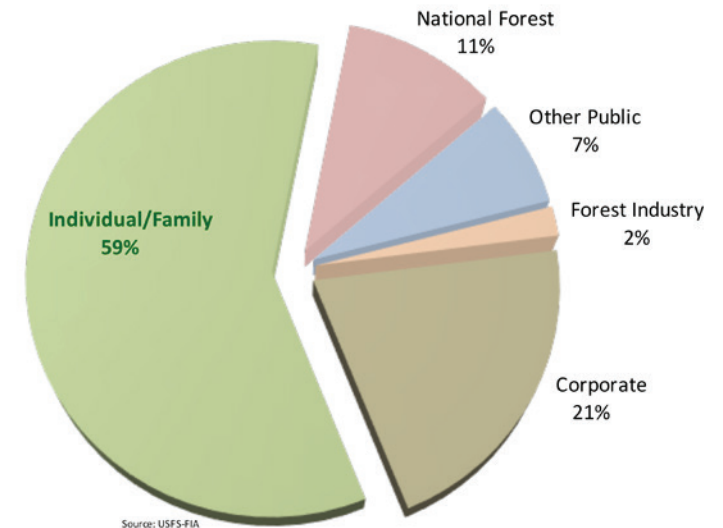
# Virginia's Reforestation History and Forest Ownership in Virginia

Virginia's Historic Planting Acres



Virginia continues to maintain a strong reforestation effort while meeting the economic needs of the state. As the *Forest Ownership in Virginia* chart indicates, the majority of forestland in Virginia is privately owned so it is thanks to the cooperative efforts of Virginia landowners, organizations, assistance programs and VDOF, our forest resource continues to be managed for sustainability.

Forest Ownership in Virginia



## Forest Inventory Analysis Program

VDOF maintains an ongoing inventory program to ensure that our forests are being managed sustainably. VDOF, in cooperation with the USDA Forest Service, conducts a forest inventory analysis (FIA) which is a primary source of statistics for the forestland in Virginia. The inventory collects and analyzes information on forest growth, forestland area, land use changes, ownership trends, and natural and human impacts to the forest.

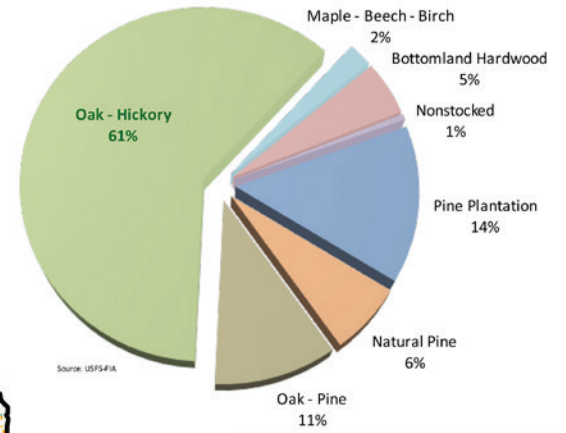
# Virginia Forest Cover and Types

**62%**  
**Forestland**  
16 million+ Acres

**20%**  
Pine

**80%**  
Hardwood/  
Hardwood-Pine

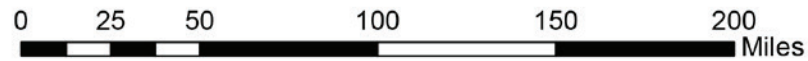
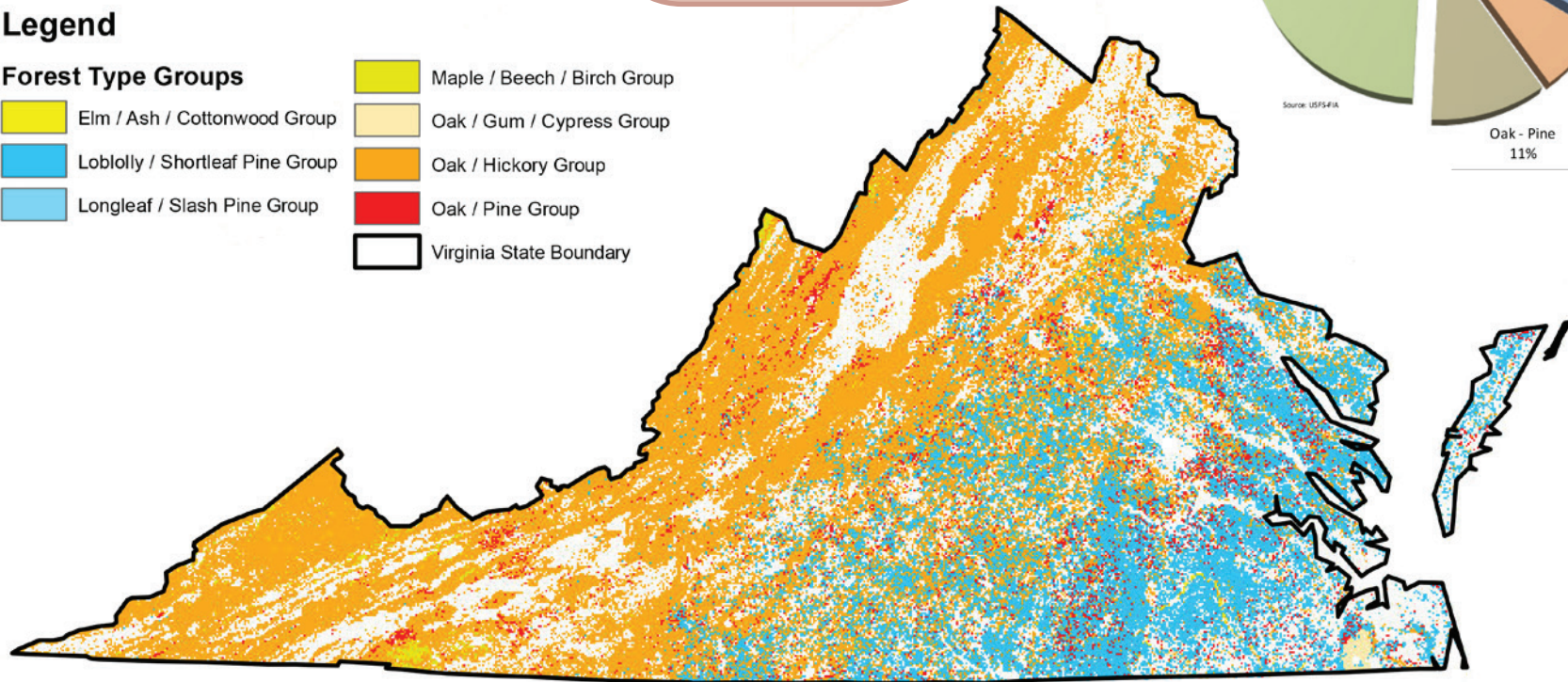
Forest Types in Virginia



## Legend

### Forest Type Groups

- Maple / Beech / Birch Group
- Elm / Ash / Cottonwood Group
- Loblolly / Shortleaf Pine Group
- Longleaf / Slash Pine Group
- Oak / Gum / Cypress Group
- Oak / Hickory Group
- Oak / Pine Group
- Virginia State Boundary



USDA Forest Service, FIA Program

Manage

# Facts at a Glance



## Forest Health

### Fiscal Year 2021

- ◆ 150 ash trees were treated by 34 applicants through the Emerald Ash Borer Treatment Program.
- ◆ VDOF staff treated 68 ash trees on state lands.
- ◆ 2,180 acres of pine were thinned via the Pine Bark Beetle Prevention Pre-commercial Thinning Cost-Share Program.
- ◆ Invasive plants were removed on 1,283 acres of state forests and state-owned lands through the USDA Forest Service Non-Native Invasive Plant Program (target plants included tree-of-heaven, Japanese stiltgrass, multi-flora rose, and autumn olive).

### Program Statistics

- ◆ Since inception in 2018, 410 applications have been approved and 1,721 ash trees have been treated through the Emerald Ash Borer Treatment Program. Additionally, 472 ash trees have been treated by VDOF staff on state lands.
- ◆ Since inception in 2004, more than 66,000 acres have been thinned via the Pine Bark Beetle Prevention Pre-commercial Thinning Cost-Share Program.



## Forest Products & Marketing

### Fiscal Year 2021

- ◆ \$2,399,527 in Forest Products Tax collected.



## Fire & Emergency Response

### Fiscal Year 2021

- ◆ 418 wildfires burned 6749 acres.
  - Damaged or destroyed \$4.2 million in timber and 53 homes/other buildings with an estimated value of \$1.4 million.
  - VDOF suppression efforts protected 841 homes/other buildings with an estimated value protected of \$66 million.
- ◆ VDOF conducted 272 prescribed burns on 4,736 acres.
- ◆ VDOF provided more than 3,800 hours of training to 237 firefighters.
- ◆ 28 new dry hydrants were installed and 15 were repaired.
- ◆ 140 volunteer fire departments received \$247,150 in Volunteer Fire Assistance funds.

### Program Statistics

- ◆ 96% of wildfires in Virginia are human-caused, most commonly from debris burning.
- ◆ VDOF responds to nearly just over 600 wildland fires that burn approximately 9,200 acres annually (based on a 10-year average, 2011 – 2020).
- ◆ VDOF's wildfire response fleet is comprised of 160 4x4 engines, 14 specially-equipped wildland brush trucks, and 89 bulldozer/wildland fire plow suppression units.
- ◆ With 45 nationally recognized Firewise USA communities, Virginia is one of the top 15 states nationally.
- ◆ Since inception in 1975, the Volunteer Fire Assistance program has provided 6,231 grants for a total of \$5,117,798 in matching grant funds.
- ◆ The Dry Hydrant program has now installed a total of 1,868 dry hydrants.



## Forest Management

### Fiscal Year 2021

- ◆ 41 riparian buffer establishment projects took place on 153 acres in the Chesapeake Bay watershed.
- ◆ 1,023 landowners with 44,461 acres participated in the Reforestation of Timberlands Program.
- ◆ 73,120 acres were planted with trees.
- ◆ VDOF staff wrote:
  - 247 Stewardship Plans on 47,516 acres
  - 110 Other Tract-Based Management Plans on 16,422 acres

### Program Statistics

- ◆ Since inception in 1971, 52,346 landowners managing 2,013,312 acres participated in the Reforestation of Timberlands Program and invested nearly \$100 million to reforest their harvested timberlands.



## Nurseries

### Fiscal Year 2021

- ◆ VDOF nurseries sold 30,205,369 seedlings of 61 tree species.

# Facts at a Glance



## Urban & Community Forestry

### Fiscal Year 2021

- ◆ The Virginia Trees for Clean Water Program allocated \$355,570 to 68 projects.
- ◆ Virginia added 4 Tree City USA Communities and 1 Tree Line USA Utility.

### Program Statistics

- ◆ Virginia has:
  - 63 Tree City USA Communities (largest in Fairfax Co. – pop. 1,172,398) (smallest in the Village of Bluemont – pop. 250)
  - 8 Tree Campus USA higher education colleges and universities
  - 5 Tree Line USA Utilities
- ◆ VDOF has 36 ISA Certified Arborists on staff.

### *Water Quality Program Statistics, continued*

#### James River Buffer Program

- ◆ 18 buffer projects have been planted on 66.4 acres with 28,801 trees
- ◆ Since inception in 2019, 33 buffer projects were planted with 103,965 trees on 188 acres.

#### Riparian Forest Buffer Tax Credit Program

- ◆ 88 Applications
- ◆ 1,388 acres of buffers retained during timber harvest
- ◆ Tax benefit of \$599,042 on buffers valued at \$2,628,839.



## Water Quality

### BMP Implementation Audit of FY2020

- ◆ BMP Audit results show a 95% BMP implementation rate on harvest operations statewide and a 95.5% rate on harvest operations within the Chesapeake Bay Watershed. One site (0.42%) had an observance of active sedimentation.

### Fiscal Year 2021

- ◆ 176,213 acres were harvested – a 13% reduction from FY20, likely due to the Covid-19 pandemic.
- ◆ VDOF staff performed 16,667 inspections on 3,742 harvest sites – an average of 4.5 inspections per harvest. This inspection rate has remained relatively constant in recent years.
- ◆ 108 Silvicultural Water Quality Law Enforcement Actions were taken – a 10% reduction from FY20. Two of these actions resulted in the issuance of a Special Order.
- ◆ The Logger BMP Cost Share Program funded 54 projects directly related to stream crossings on timber harvest operations.
- ◆ VDOF trained 372 loggers on BMPs and water quality protection techniques via 6 sessions – some sessions were virtual due to the Covid-19 pandemic.
- ◆ VDOF assisted the Farm Service Agency (FSA) to share information about the Pandemic Assistance for Timber Harvesters and Haulers (PATHH) Program.
- ◆ Exhibits related to BMPs were displayed at the East Coast Sawmill and Logging Equipment Expo and the Virginia Loggers Association Annual Meeting.

### Program Statistics

- ◆ 10,689 logging professionals have been trained since 1997 during 355 logger training programs.



## Forestland Conservation

### Fiscal Year 2021

- ◆ VDOF added 2,554 acres of conserved lands through 3 easements, including 13.4 miles of watercourses to the Open-Space Conservation Easement Program.

### Program Statistics

- ◆ VDOF holds 196 easements in 60 counties/cities protecting more than 87,565 acres of forestland. Of these, 125 easements totaling 32,522 acres lie within the Chesapeake Bay watershed.
- ◆ Since inception in 2016, 52 properties have received Century Forest designation, including 16,879 acres.



## State Forests & State Lands

### Fiscal Year 2021

- ◆ Charlotte State Forest, 5,005 acres, added in Charlotte Co.
- ◆ State Forests generated more than \$1,500,000 in timber sale revenue with more than \$200,000 paid to counties where revenues were generated.
- ◆ Management of forested state-owned lands yielded more than \$230,000 in timber sale income and spent more than \$50,000 in the treatment of invasive species such as Kudzu and Ailanthus.

### Program Statistics

- ◆ Virginia has 26 State Forests totaling 74,286 acres, of which 74,152 acres are certified sustainable.