



2018 STATE OF THE FOREST



The future is bright for forest industry in Virginia.

ANNUAL REPORT
ON VIRGINIA'S FORESTS

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FROM THE STATE FORESTER



It is an honor to serve as the eighth state forester of Virginia and to lead the Virginia Department of Forestry (VDOF) as we work to ensure that the forest resource in Virginia remains healthy and continues to provide the wide range of benefits to the commonwealth. This is a great time to be working in forestry in Virginia; there are emerging opportunities to pursue and there are significant challenges to face. It is a pleasure to serve in the administration of Governor Ralph Northam under the new Secretary of Agriculture and Forestry – and previous State Forester – Bettina Ring. Governor Northam is committed to economic development that protects and sustains a healthy environment and that is well-suited to the mission of the VDOF.

As you will see in this report, the forest resource in Virginia is robust and growing and we are working hard to keep it that way. Last year was a record year for the volume of timber harvested in Virginia based on analysis of receipts from the Virginia Forest Products Tax, while at the same time the annual growth of hardwood and softwood trees greatly exceeded the amount harvested. The VDOF water quality inspection program monitors all timber harvesting in the state to ensure that sediment does not enter our streams and rivers. Our annual audit process of randomly selected timber harvests shows that the implementation rate for water quality best management practices (BMPs) was 95 percent statewide and 96.6 percent within the Chesapeake Bay watershed.

Of course, forest products are just one of the benefits that we derive from our trees and forests. Trees help reduce stormwater flows, save energy and improve human health, and the VDOF is working to increase the benefits that trees provide in our communities. Our trees and forests are increasingly being counted on to protect and restore water quality because forest cover, even when timber harvesting is practiced, is the best landcover for reducing nutrient and sediment runoff from the land. Preventing the conversion of forest to other land uses is an ongoing challenge that the VDOF is addressing through land conservation programs such as our working-forest conservation easements (VDOF now holds 170 of these) and the Generation NEXT program, which helps forest landowners plan how their forestlands and their stewardship wishes will be passed to the next generation.

Virginia was fortunately spared this year from significant damage caused by wildfire and hurricanes, but VDOF staff responded to local storm damage throughout the year and traveled to multiple western states to assist with wildfires. The VDOF also continues to work with woodland communities here in Virginia to reduce their potential risk from wildfire. Other threats that we are working to address include exotic pests such as the emerald ash borer and the spotted lanternfly, which has been discovered in Virginia.

At the VDOF, we believe that healthy and sustainable forests depend on sound forest management that addresses the full range of landowner goals. Just in the past year, VDOF foresters provided landowners with plans covering more than 150,000 acres. Getting these plans into practice on the ground relies upon maintaining diverse markets for forest products. Fortunately, wood is a versatile, renewable resource that can play a major role in reducing the world's dependence on fossil fuels. The VDOF is working with the Northam administration to grow existing markets and seek out new ones for Virginia's oldest export product, wood.

We also continue to support forest landowners through our ongoing research programs, educational demonstrations on our state forests and production of more than 30 million seedlings a year at our two nurseries. It is the sum of all of these efforts, in partnership with Virginia's forest landowners, the loggers, our forest products industry, conservation agencies and our many other partners, that will keep Virginia green and wooded and prosperous. Thank you for your interest in Virginia's forests and the work of the VDOF. Please feel free to contact us if you have any questions or if we can provide further information.

Sincerely,

State Forester

VIRGINIA FOREST TRENDS



Forested Land

For 2018, more than 16 million acres – more than 62 percent of the Commonwealth (Figure 1) – qualified as forestland. Of this forestland, 15.3 million acres are categorized as commercial timberland and more than 500,000 acres are categorized as reserved forestland, e.g., Shenandoah National Park, VA State Parks, etc.

Since 1977, an average of more than 16,000 acres of forestland has been converted to non-forest uses annually, a trend that is projected to continue.

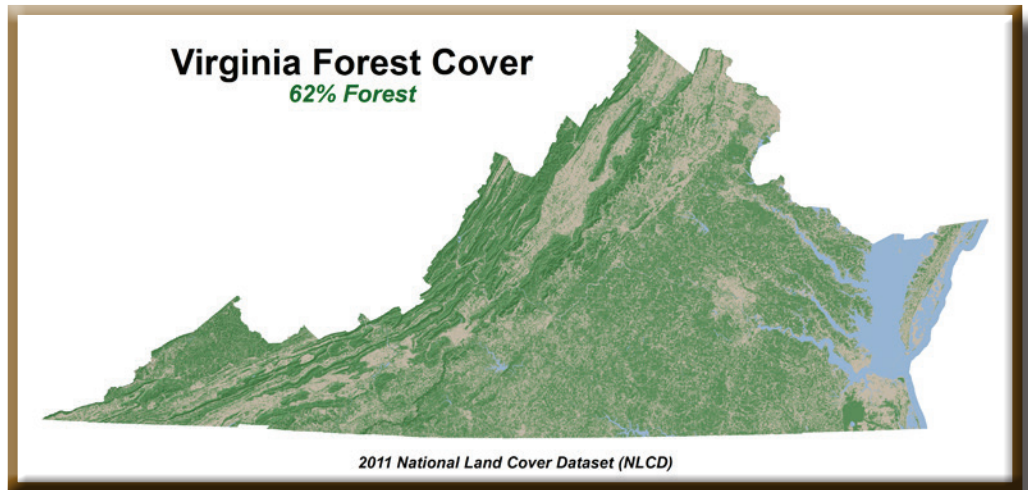


Figure 1 Virginia Forest Cover

Forest Ownership

Most of Virginia's forestland is privately owned (more than 13 million acres). An estimated 521,000 individuals and families in Virginia hold a total of approximately 9.8 million acres.

By 2016, ownership of forestland by forest products firms had declined to slightly more than one percent (183,000 acres) of the total forestland area. This is a reduction from seven percent in 2001, and down from 11 percent in 1992.

The balance of Virginia's forestlands (18 percent) is owned by federal, state and local governments; the largest entity being the USDA Forest Service National Forest System, which holds 1.7 million acres (Figure 2).

The Virginia Department of Forestry, through its 24 state forests, holds 68,858 acres of forestland.

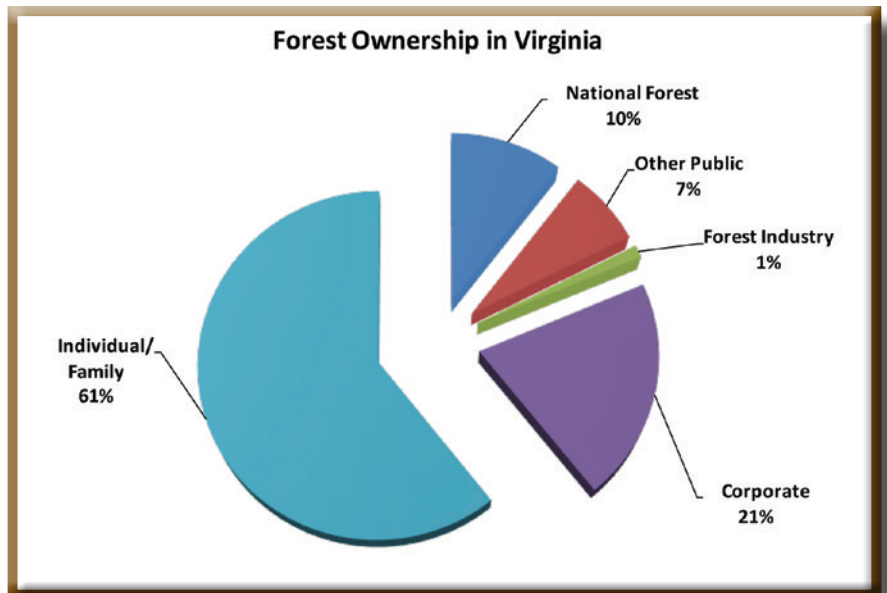


Figure 2 Forest Ownership in Virginia, 2016

VIRGINIA FOREST TRENDS,

continued



Forest Types

The composition of Virginia's forests demonstrate good diversity. Hardwood and hardwood-pine forest types make up more than 12.7 million acres of the Commonwealth's forest – more than 79 percent. The area of hardwood forest types has increased steadily since the first forest inventory in 1940, when 8.1 million acres existed. The hardwood forests of Virginia are maturing, with more than half the hardwood acreage in stands 60 years old or older.

Pine forests represent approximately 3.2 million acres (21 percent) of Virginia's forestland. This is a decline from the 6.2 million acres of pine found during the 1940 inventory. Pine plantations now constitute more than 66 percent of the pine acreage (Figure 3).

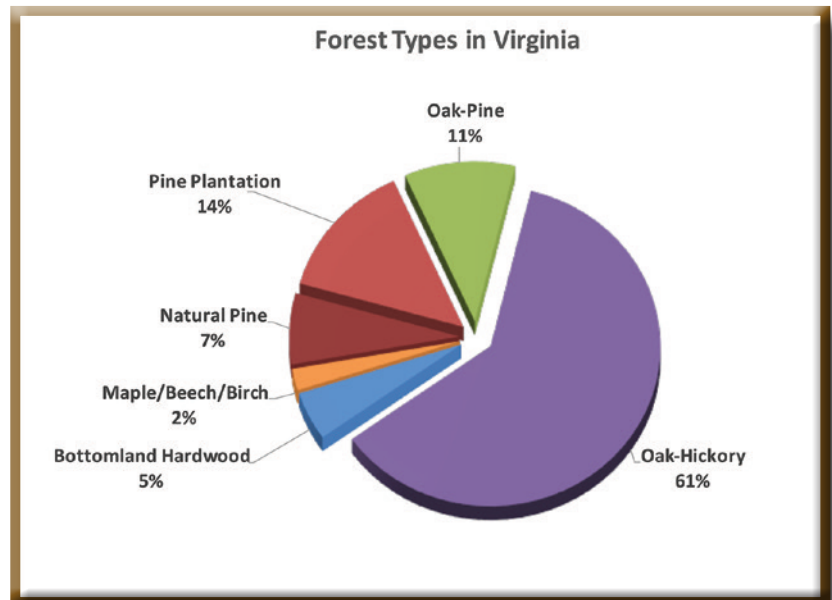


Figure 3 Forest Types in Virginia, 2016

Forest Sustainability

For 2016, the ratio of the forest's annual growth compared to harvest volume (on private and state lands) was more than 2.3:1 for softwood species and 2.6:1 for hardwood species (Figure 4). This amounts to an annual surplus of 10.5 million tons of softwood and 17.6 million tons of hardwood statewide on commercial timberland.

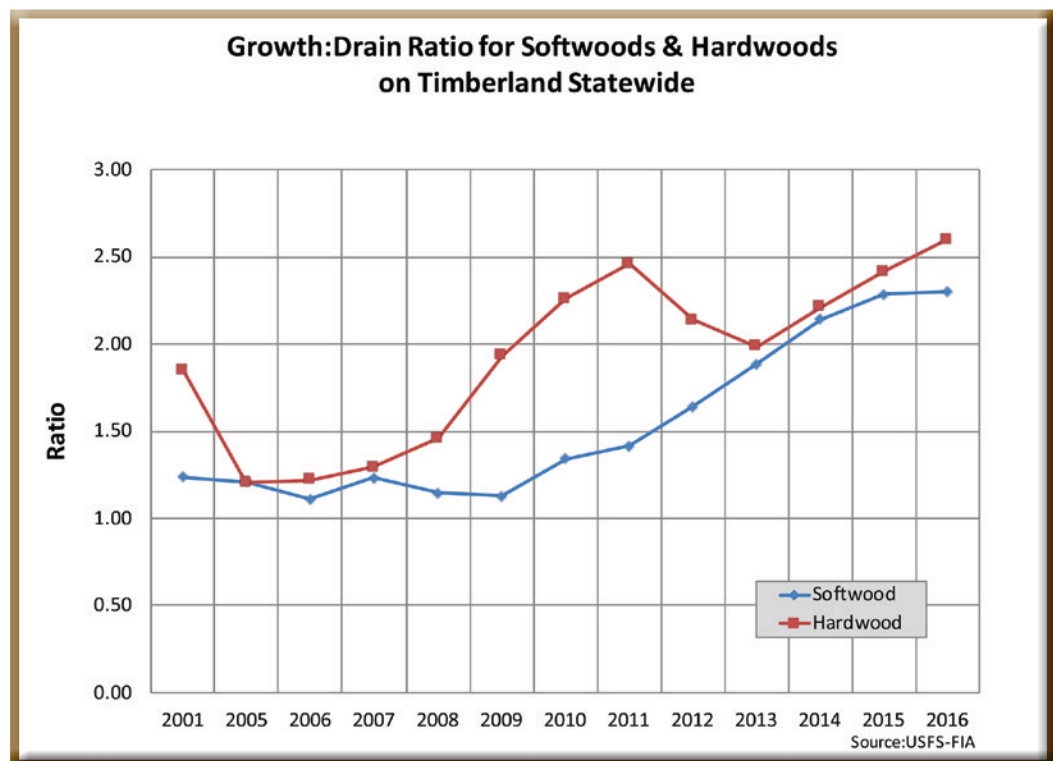


Figure 4 Growth:Drain Ratio for Softwoods and Hardwoods, 2016

FORESTLAND CONSERVATION



The VDOF Forestland Conservation Program focuses on keeping family woodlands intact, in forest and, where desired, in family ownership. The three pillars of the program are conservation easements, inter-generational land transfer outreach and the Century Forest Program. 2017-2018 proved to be highly successful in all three areas.

Conservation Easements

The VDOF Conservation Easement Program enables forest landowners to make certain their lands are available for forest management in perpetuity, with a focus on forests that provide the greatest range of natural functions and values.

Since larger blocks of working forest provide the greatest range of benefits, VDOF conservation easements emphasize keeping the forest land base intact and undivided, enabling landowners to manage their forestland for timber products and environmental values. In FY2018, the VDOF permanently protected 8,395 acres of open space and nearly 49 miles of water courses through 24 conservation easements.

The agency now holds 170 easements in 57 counties and the City of Suffolk, covering 52,180 acres. VDOF easements continue to reflect the goal of conserving large blocks of forestland – perpetually preserving the sustainable flow of products, functions and values from our woodlands and serving as the backbone for a \$21.5 billion economic engine. In addition to protecting more than 47,000 acres of the working forest land base and drinking water sources for millions of Virginians, collectively, they also help maintain viewsheds from state designated scenic rivers, thoroughfares and rural communities; preserve habitat for rare species and natural communities, and are directly adjacent and provide effective buffers to federal and state public lands and other conserved lands.

Generation NEXT



The consideration by a family forest landowner to keep their woodland intact, in forest and in family ownership may be the most fundamental decision they can make. Once they do so, then planning for the orderly inter-generational transfer of their property is perhaps the most important conservation action they can take.

Generation NEXT is designed to inform and inspire these landowners, equipping them to make informed and intentional decisions regarding passing their land forward to future generations.

VDOF and Virginia Cooperative Extension (VCE) continued to offer the award-winning short course "Focusing on Land Transfer to Generation NEXT," hosting workshops in Chatham,

New Kent and Radford. The program uses a public/private/non-governmental-organization collaboration of legal, financial and conservation professionals to focus on issues related to the transfer of forestland and its management from one generation to the next, thus providing family woodland owners information on the tools needed to keep their forestlands intact and in family ownership.

For the first time in its nine-year existence, Generation NEXT workshops were held statewide in 2017. The short courses in Chatham, New Kent and Radford were collectively attended by members of 29 families who own 24,255 acres. Participants indicated the program would increase the likelihood of their property staying intact (86 percent), in forest (79 percent) and in the family (82 percent). By the end of this two-part workshop, more than 95 percent of the participants had already initiated or enhanced their estate planning.



Generation NEXT Workshop in Chatham, VA.

FORESTLAND CONSERVATION,

continued



Since 2009, a total of eight workshops have been held involving 283 individuals representing 192 families. Following participation, landowners indicated the program would increase the likelihood of their property staying intact (84 percent), in forest (80 percent) and in the family (79 percent). Follow-up surveys reveal that in the six months following the short course, 85 percent of families have begun succession planning. As these families continue executing their plans, more than 98,500 acres of land are expected to remain intact and family-owned.

In a continued effort to expand the program's influence and visibility, the Generation NEXT logo successfully received registration by the United States Patent and Trademark Office. The program was highlighted during the Virginia United Land Trusts (VaULT) Conference and was presented to fellow natural resource professionals at the 2017 Chesapeake Watershed Forum. A fourth "You-Tube"-style video spotlighting "Your Land, Your Legacy" was completed and is available on the VDOF Forestry, VCE and Virginia Tech Natural Resources channels.

Century Forests

Virginia launched the nation's first and only Century Forest Program on July 1, 2016. The program honors and recognizes those Virginia landowners whose families have owned working forestlands for more than 100 years, acknowledging their long-term commitment to enhancing the environment and protecting the quality of life for their fellow Virginians through forestry. This commitment in the past, and going forward, not only determines what Virginia's forests look like today, but will play a critical role in defining their future.

To date, 39 families holding 14,446 acres with a combined tenure of 6,159 years have been recognized. The properties range in size from 40 acres to 2,833 acres, with an average size of 370 acres. These families' ownerships ranged from 105 years to 277 years, with an average tenure of 158 years – an ownership that spans more than six generations.

The Century Forest designation taps into the deep connection that family forest landowners have with their land. These families have attained a significant milestone for forest landowners and set the standard for preservation of the Commonwealth's woodland heritage. They recognize their woodland legacy is longer than their tenure, and it is important to them that their forestland, along with the associated family stories and memories, are passed forward intact to future generations.

To qualify for Century Forest designation, the property must have been owned by the same family for at least 100 consecutive years; include at least 20 contiguous acres of managed forest; be lived on or managed by a descendant of the original owners, and have a history of timber harvests or forest management activities.



Headquarters Building Dedicated and Named the James W. Garner Building

VDOF named and dedicated its headquarters building to former State Forester Jim Garner on April 26.

In addition to Jim's family and friends, former Governor Gerald Baliles, Secretary of Agriculture and Forestry Bettina Ring, former State Forester Carl Garrison, former Board of Forestry member Nelson Flippo and current Board of Forestry members Beth Flippo Hutchins, Dr. David Smith, Ken Morgan, Glen Worrell and John Burke III, attended a ceremony and reception to honor Jim and present the building's new sign, designed and created by Acting Deputy Western Regional Forester Brad Carico.

STATE FORESTS



Virginia's 24 state forests, totaling 68,858 acres, are unique in their purpose, funding and use by the public. State forestlands have multiple objectives and are managed to provide the greatest range of benefits to the citizens of Virginia while remaining self-supporting and protecting or improving the forest ecosystem.

Our state forests are managed to demonstrate scientific forest management, applied forest research, development of diverse wildlife habitat, watershed protection, forest management to develop diverse timber stands that support biological diversity and to provide for passive outdoor recreation.

Virginia State Forests were certified under the Sustainable Forestry Initiative SFI 2015-2019 Forest Management Standard and the American Forest Foundation Tree Farm System 2015-2020 Standards of Sustainability. Certification in these programs ensures that forestry is practiced in an environmentally responsible and socially beneficial manner.

The state forests are well distributed around the Commonwealth and vary in size from 121 acres to 19,808 acres. The large state forests in central Virginia and southeastern Virginia are the core of the working-forest concept and provide the majority of the income to fund the forest system.

Recreational opportunities on these lands are focused on self-directed activities that are not available on many other state lands. These activities include hiking, bike riding, horseback riding, orienteering, hunting, fishing and wildlife viewing. The central Virginia state forests offer a unique opportunity to enjoy the outdoors due to their large size, which provides for an outdoor experience far removed from many of the distractions found in more densely populated areas. State forest resources are limited, however, and recreational usage must be balanced with good forest management to protect the integrity of the state forest purpose.

In recent years, forest users have become more diverse as have their expectations of forest accessibility and usage. Traditional uses, such as hunting and fishing, remain popular uses of the forest, while new interests, such as hiking, horseback riding, mountain biking, adventure races, orienteering, bird watching and enjoying solitude, are becoming popular uses.

As the areas surrounding the state forests continue to grow in population, recreational uses of the land will change along with the expectations of the general public. VDOF continues to be conscious of the changing expectations of the public and works towards providing recreational opportunities compatible with state forest timber management objectives while providing a rewarding outdoor recreation experience for the public. .

State Forests are also increasingly used for educational efforts including landowner education, youth education programs,; soil and water conservation district programs, demonstrations and continuing education credits for loggers, outdoor laboratories by various college disciplines, several Extension programs as well as ecotourism.

To address the increasing use of state forests for such activities, VDOF embarked on the establishment of a forest conservation and education center located at the Matthews State Forest in Grayson County. Construction on this facility is primarily funded through a trust established by the late Judge Jack and Clare Matthews. Completion of this project and a new three-mile trail on Cumberland State Forest is anticipated for 2019. Vegetation to enhance pollinating insect populations has been planted on Cumberland and Appomattox Buckingham State Forests.

In 2019, the Virginia State Forest System will be 100 years old. The Virginia Forest Service established the State Forest System in 1919 with a gift of 588 acres through the will of Mr. Emmet D. Gallion in Prince Edward County. This has come to be known as the Prince Edward-Gallion State Forest. It was Mr. Gallion's intention to advance the cause of forestry in Virginia.

FOREST MANAGEMENT



It's remarkable that Virginia has more than 8 million citizens, yet has 16 million acres of forestland. The large majority of this land (13 million acres) is privately owned. VDOF works closely with private landowners to meet their specific objectives, and to help assure that their forests are well-managed and provide natural resource benefits to the Commonwealth.

The best way to meet individual and resource goals is through forest management planning. A forest management plan is an essential first step for landowners, as actions taken today will affect the forest over many years. VDOF has foresters across Virginia who meet with landowners, walk the land, observe conditions, gather data and then prepare customized forest management plans to help owners meet their goals. The Forest Stewardship Plan is a comprehensive plan that considers many of the natural resources on the property including timber, soil, water, wildlife and recreation. VDOF's Forest Stewardship Program operates in cooperation with, and support of the USDA Forest Service's Cooperative State and Private Forestry section. The Stewardship Coordinating Committee, a group of diverse partners, helps to advise VDOF on these efforts.

Forest management planning can also take the form of evaluating parts of a tract of land, making recommendations prior to a timber harvest, creating brief plans for use-value taxation qualification or outlining steps for a specific forest management practice. In 2017-18, VDOF foresters prepared more than 3,300 plans on 157,459 acres.

Plans lead to action! All plans contain recommendations for action to reach a desired outcome. "Action" could mean many things, from thinning trees to improved growth on the best trees, controlling unwanted trees or plants, harvesting mature trees, planting new trees or simply fostering and monitoring the growth of young forests. The actions are also designed to have multiple benefits, like creating habitat for specific birds or animals, creating conditions where bees and other pollinators will thrive, addressing runoff or erosion issues or opening up a trail to access a scenic spot. Landowners, working with VDOF staff, private consulting foresters, loggers, forest industry personnel and other state and federal conservation agencies, accomplish great things on their land. A tangible outcome of this in the 2017-18 season was tree planting on 53,706 acres.

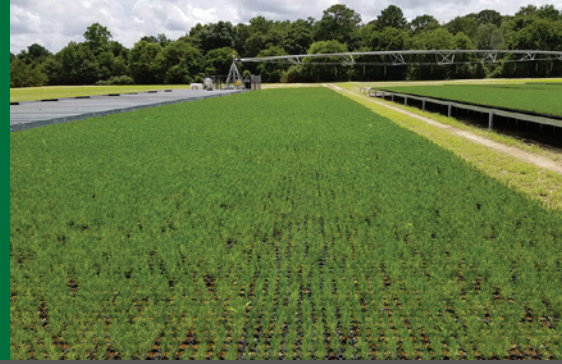
Virginia is very fortunate to have tools to assist landowners with forest management. One of these tools is the Reforestation of Timberlands (RT) Program. Begun in 1970, this flagship program combines funds from forest industry and the Commonwealth to support planting and improvement of pine trees on private land. Pines support a vibrant forest economy, capture and store vast quantities of carbon as they grow and add diversity to Virginia's forests. While they make up only 20 percent of the forests, they grow fast and produce approximately 45 percent of the annual wood volume harvested.

Recognizing the importance of sustaining this pine resource, VDOF has recently added two pine sustainability foresters and an additional field forester to concentrate on these efforts. The RT program is delivered to

landowners by VDOF foresters and staff, but is guided by an active subcommittee of the Board of Forestry. The program emphasizes increasing productivity and quality by focusing on preparing land prior to planting, deploying seedlings of high genetic quality and careful planting. In the 2017-18 season, the RT program provided assistance on 43,115 acres.

Virginia is actually a hardwood state, with deciduous (leaf-dropping) trees making up 80 percent of Virginia's forests. These diverse forests of oaks, maples, poplars, gums, locusts, ash and many other species provide benefits ranging from timber to wildlife food and habitat and beautiful fall color. Recognizing the importance of hardwood, VDOF has prepared a hardwood sustainability plan to assure that we will continue to enjoy these benefits. Vast, stable and growing, hardwood forests need attention to promote quality tree growth, and insect and disease monitoring and management, control of any invasive plants, and to assure regeneration of new forests. Elements of the plan include working with a wide variety of partners and stakeholders in planning, training, communicating, demonstrating and implementing practices. Virginia is also cooperating with neighboring states to maintain and improve hardwood forests, particularly oaks. Planning and action result in managed forests for Virginians.

NURSERIES



VDOF has been growing seedlings since 1916, and currently operates two nurseries to produce softwood and hardwood seedlings for reforestation needs in Virginia. The Garland Gray Forestry Center (GGFC), located in Sussex County, produces approximately 30 million bare-root loblolly pine seedlings annually. The Augusta Forestry Center (AFC), located in Crimora on the western side of the Shenandoah National Park, produces 2 million bare-root hardwood and conifer species annually.

The nurseries are self-supporting – meaning they receive no tax dollars – and their operating funds are generated from the sale of tree seedlings. Additionally, the nursery program funds the agency's seed orchard, tree improvement and research budgets. The North Carolina State University (NCSU) Tree Improvement Cooperative compiles data on each member's pine progeny test measurements and ranks the pine families according to their productivity (P), rust resistance (R) and straightness (S) to determine a PRS value. As a member of the Cooperative, VDOF's loblolly pine seedlings produced at the GGFC have PRS values for each of its seedling offerings. They are categorized in four "family" lots based upon their PRS values. These families out-perform unimproved loblolly stocking by 50 percent to 90 percent when managed properly. This increased productivity helps to keep Virginia's forests sustainable and producing more fiber each year for our forest product needs. The economic value of planting VDOF seedlings is well documented and is promoted to landowners and contractors to educate them on the benefits of our Virginia seedlings.

The nursery undertook a significant new project in 2018 to start producing containerized longleaf pine seedlings at GGFC. The \$400,000 project will ultimately produce up to 500,000 longleaf seedlings annually to help restore this diminished species to the landscape of Virginia. In the spring of 2018, longleaf pine seeds were sown in 173,824 containerized tray cells. To meet the needs of specific customers and to evaluate the containerized market for loblolly pine, 367,360 cells were sown with loblolly pine seed. The operation will have additional capacity to grow grass species, which complement the longleaf ecosystem.

Demand for loblolly pine seedlings has risen slightly over the last few years, and GGFC has made modest increases in its production to meet customer needs.

Loblolly and Longleaf Pine Containerized Seedlings

Hardwood seedling demand has declined during the last decade, as fewer acres of coal mining reclamation lands are being planted. AFC has adjusted to customer preferences and offers a variety of specialty seedling packages, such as those for quail habitat, riparian buffers and wildlife food plots. A pollinator seedling pack offering was added for the 2017-18 season and will continue for those customers interested in planting species beneficial to pollinators.

The VDOF nurseries will continue to improve seedling productivity and species offerings to meet the needs of Virginia landowners.



Mechanized Production Line for Containerized Seeding

FIRE AND EMERGENCY RESPONSE



Fire

The Virginia Department of Forestry responds to nearly 800 wildland fires that burn approximately 12,000 acres annually (based on a 10-year average, 2008-2017).

Although on average, 69 homes and other structures are damaged or destroyed by wildland fire each year, agency efforts protect more than 1,600 others at a value of more than \$115 million.

From July 1, 2017 through June 30, 2018:

- ▲ 727 fires burned 6,683 acres.
- ▲ Nearly \$2.7 million of timber was damaged.
- ▲ Damage to homes and other buildings amounted to more than \$845,058.
- ▲ An astounding 688 homes, worth more than \$98.6 million, along with an additional 8,533 other structures, worth an estimated \$15.9 million, were protected, thanks to VDOF efforts.

VDOF relies on highly-trained and experienced personnel operating a fleet of 160 4x4 engines, including 14 specially-equipped wildland brush trucks and 89 bulldozer/wildland fire plow suppression units for quick response to any reported wildland fire or other weather-related emergency. The assistance of Virginia's 768 fire departments and close working relationships with federal land management agencies and other public and private landholders in the Commonwealth ensure that wildland fire response in Virginia is both efficient and effective.

VDOF personnel also volunteer to provide incident management expertise to support other all-risk incidents when the need exists. VDOF also support other states during emergencies, having responded to incidents in California, Colorado, Idaho, Montana, Oregon, Texas, Utah and Washington. The practical experience gained during these events equips agency employees with a broad base of expertise to handle any emergency in Virginia.

Law Enforcement

VDOF personnel are the only responder group in the state who are both firefighters and law enforcement personnel. Agency law enforcement duties focus on forestry and fire-related laws, wildfire arson investigations and fire suppression cost collections throughout the state. In Fiscal Year 2018, agency officers issued 53 summons/warrants and handled 203 court actions.

Training Program

VDOF is a recognized national leader in its delivery of wildfire suppression, incident management and personnel development training for emergency responders. In June 2018, the VDOF held its 18th annual statewide Interagency Wildfire Academy, which is one of the four largest in the

nation. During the 2018 fiscal year, the VDOF provided training to 707 firefighter students representing more than 9,000 hours of total training. Agency training events hosted responders from various state and federal agencies across the state, responders from six surrounding states and from more than 131 Virginia volunteer fire departments.

Dry Hydrant Program

The Virginia Dry Hydrant Grant Program is funded by the Virginia General Assembly using money from the Virginia Fire Programs Fund and administered by the VDOF. The objectives of the program are to:

- ▲ Conserve energy by reducing losses from fire;
- ▲ Conserve energy by reducing miles traveled to shuttle water;
- ▲ Fund the installation of dry hydrants that otherwise would not be installed, and
- ▲ Conserve processed domestic water supplies in urban and urbanizing areas.

Fire departments listed with the Department of Fire Programs are eligible to apply for dry hydrant grants. A total of 27 new dry hydrants were installed through the program last year. Additionally, nine others that were already in the program were repaired. The Virginia Dry Hydrant program has now installed a total of 1,764 dry hydrants throughout the state.

FIRE AND EMERGENCY RESPONSE

continued



Volunteer Fire Assistance Program (VFA)

The Volunteer Fire Assistance Program continues to increase the fire protection capability in Virginia. This is accomplished through financial assistance to rural volunteer fire companies to provide additional training and the acquisition of small equipment and wildland personal protective equipment (PPE). Since the 1975 inception of this program, 5,857 grants have been made, providing a total of \$4,427,927 in matching grant funds.

The VDOF program is part of a grant that improves the capability and effectiveness of America's 26,000 rural volunteer fire departments – 580 of them in Virginia – to protect lives and other rural investments. The purpose of this program is to provide financial, technical and other assistance to State Foresters and other appropriate officials to organize, train and equip fire departments in rural communities. In 2018, 133 rural volunteer fire departments in the Commonwealth received \$221,739 in VFA funds. Requests for support continue to greatly exceed the available funding; last year's assistance requests totaled \$1,200,000.

Wildfire Prevention

In Virginia, 96 percent of wildfires are human-caused; the most prevalent cause being debris burning. This makes fire prevention efforts in Virginia critical to the VDOF forest protection program. From the strong industrial base worth \$21.5 billion in annual economic output to 108,000 forest-related jobs, forests in Virginia are healthy and diverse. Virginia has 16 million acres of forestland. Private individuals own 61 percent of Virginia's timberland and the VDOF is responsible for protecting these lands from damage by wildfire. The easiest and most economic way to suppress a fire is to do so before it starts. VDOF maintains a multi-faceted fire prevention program, which includes person-to-person contacts, media outreach, exhibits and fire prevention programs to schools, talks and presentation to civic organizations and other groups to constantly keep the public "fire prevention conscious." The programs encourage cooperation with public agencies with similar goals and inform the public of current and potential forest fire danger.

FireWise

Firefighters in the wildland/urban interface (any area where wildland fuels threaten to ignite combustible homes and structures) must overcome significant challenges. Everyone in the vicinity of such a fire is at risk, and the risk is greatly increased in areas that aren't prepared. FireWise educates homeowners in the wildland/urban interface to design, construct, landscape and maintain their homes and property to avoid destruction during a wildfire.

Virginia has an expanding wildland/urban interface posing unique wildfire challenges. The VDOF has been a leader nationally in the promotion and expansion of the FireWise Program. Virginia has 56 nationally recognized FireWise USA communities, making Virginia one of the top 15 states with communities recognized under the program. The challenge of high-risk homes in a woodland environment is expanding, and the VDOF is aggressively working to reduce the total threat to Virginia's communities. To learn more, visit www.firewisevirginia.org.



WATER QUALITY PROTECTION



Water quality is important for all Virginians. Studies have shown that the cleanest water comes from forested watersheds. These watersheds are critical sources of pure drinking water, habitat for important fisheries and areas that are treasured for their recreational value. This is especially important when considering the Total Maximum Daily Load (TMDL) and Watershed Implementation Plan (WIP) that has been developed for the Chesapeake Bay. Two of VDOF's important measures involve water quality. One focuses on Best Management Practices (BMPs) for forest harvesting operations and protecting streams from sediment. The other focuses on improving and protecting watersheds through management and land conservation.

VDOF has been involved with the protection of forested watersheds since the early 1970s, with the development of the first set of Forestry BMPs for Water Quality. VDOF utilizes the fifth edition of those guidelines, published in 2011. The backbone for VDOF's water quality effort is the harvest inspection program, which began in the mid-'80s. This program has provided for one-on-one contact between VDOF and the harvest operators and is welcomed opportunity to educate the operators on BMPs and the latest in water quality protection techniques. In fiscal year 2018, VDOF field personnel inspected 4,774 timber harvest sites consisting of a total of 18,086 site visits (an average of 3.8 visits per site) across Virginia on 216,077 acres – a slight decrease in the number of acres harvested in FY2017.

Logger education is another main focus of the VDOF water quality program. Since the development of the first BMP Manual for Virginia, the VDOF has been involved in training harvesting contractors in water quality protection techniques, ranging from harvest planning, map reading and the use of GPS units, to BMP implementation. This occurred through agency-sponsored training and, more recently, through VDOF participation in the SFI® SHARP (Sustainable Harvesting and Resource Professional) Logger Training Program. Since 1997, this program has enabled VDOF to assist in training 9,272 harvesting professionals in 304 programs relating

to water quality protection. For fiscal year 2018, there were 20 training programs offered with a total of 606 participants. Six of these courses were in the core area (148 attendees), and the remaining 14 courses were for logger continuing education (458 attendees). VDOF has also been involved in several wetland initiatives this past year related to bottomland hardwood sustainability and the wood pellet industry. These will continue for the next several years.

In July 1993, the General Assembly of Virginia – with the support of the forest industry – enacted the Virginia Silvicultural Water Quality Law, §10-1-1181.1 through §10.1-1181.7. The law grants the authority to the State Forester to assess civil penalties to

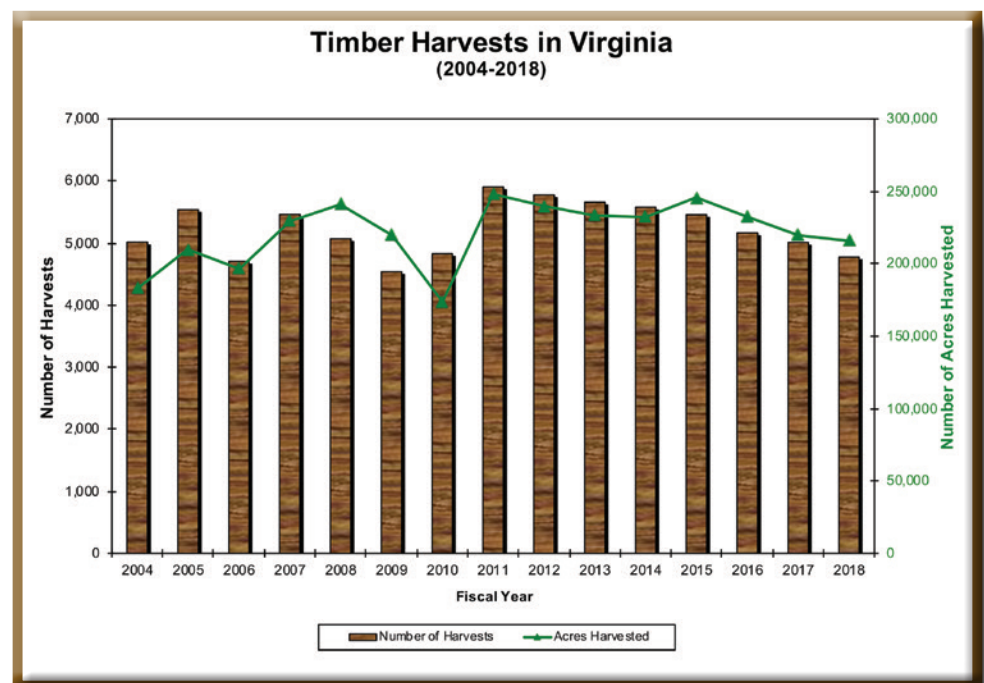


Figure 8 Timber Harvests in Virginia



those owners and operators who fail to protect water quality on their forestry operations. Virginia continues to be the only state in the southeastern United States that grants enforcement authority under such a law to the state's forestry agency. In fiscal year 2018, the VDOF was involved with 192 water quality actions initiated under the Silvicultural Law. This is a slight increase of three percent from FY2017. Of these actions, two resulted in special orders being issued for violations of the law.

A statewide audit system has been in place since 1993 to track trends in BMP implementation and effectiveness. Results from calendar year 2017 data show that the BMP harvest median implementation rate on 240 randomly selected tracts is 95 percent statewide, the harvest median score is the best judge of central tendency of the tract score. The audit results also showed that 100 percent of the sites visited had no active sedimentation present after the close-out of the operation. The information compiled using this audit process will be the basis of reporting for the Watershed Implementation Plan (WIP) that is in response to the TMDL for the Chesapeake Bay. Since the information is captured through GIS technology, this information can be compiled spatially for reporting on those forestry operations that occur within the boundaries of the Bay watershed. For calendar year 2017, the BMP implementation rate harvest median score for forest harvesting within the Bay Watershed was 96.6 percent. The 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).

VDOF offers cost-share assistance to timber harvest operators through a unique program that utilizes funding from the state's Water Quality Improvement Fund. This program shares the cost of the installation of forestry BMPs on timber harvest sites by harvest contractors. In FY2016-2017, this program funded 30 stream protection projects incorporating the use of portable bridges to provide stream crossing protection for the site for which they were funded and continue to provide stream protection for years to come. No additional funding was provided for this program in FY2018.

Watershed Protection

Because forests provide the best protection for watersheds, one of VDOF's goals is to increase the amount of forestland protected and established in Virginia's watersheds. VDOF focuses is on practices that will have a high benefit to water quality, specifically protecting water quality on land that is permanently protected by a conservation easement; establishing and maintaining riparian buffer zones; planting trees on non-forested open land, and increasing urban forest canopy by planting trees. All of these activities are closely related to meeting water quality goals associated with the Chesapeake Bay restoration and watersheds for Virginia's southern rivers. FY2018 proved to be one of the most active years in the young history of the VDOF easement program; the agency reviewed harvest plans

and inspected for BMP compliance on six 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 ground cover near the stream; shade for the water, and 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 2017 was 65, a slight increase in number of applications over the previous year. This watershed protection option provided a tax credit of \$416,549 on timber valued at \$1,750,212 that was retained in the streamside areas of their property.

Forests provide superior watershed benefits over nearly every other land use. Because of this, VDOF encourages planting open land with trees, establishing new riparian forested buffers where none previously existed and providing protection of existing riparian forests through a tax credit.

FOREST HEALTH



Spotted lanternfly adult

The VDOF Forest Health Program monitors the Commonwealth for major forest pests, pathogens, non-native invasive plants and other disturbances. A variety of forest health threats were identified in 2018.

Outbreaks of gypsy moth in Virginia have historically been cyclical with years of heavy activity and severe defoliation followed by years with virtually no noticeable damage. For the past three years, gypsy moth activity has been concentrated in southwest Virginia, particularly Bland and Giles counties. Aerial surveys in 2018 revealed approximately 12,000 acres of defoliation due to gypsy moth in the southwest, as well as some areas of patchy defoliation in the Shenandoah Mountains. In total, roughly 20,000 acres with moderate defoliation and 3,900 acres with heavy defoliation were mapped in 2018. A single defoliation event will likely not cause tree mortality, but since this is the third consecutive year of gypsy moth damage in Bland and Giles counties, tree mortality may increase especially in mature oaks. Oak decline, a disease complex associated with an aging cohort of oaks that results from a combination of abiotic and biotic factors, is one of the largest mortality factors for mature hardwoods in Virginia. Declining oaks are common and widespread throughout the state, and increased pressure by defoliators such as the gypsy moth only exacerbates the issue.

Native defoliators are always present in low numbers throughout the state but rarely cause long-term damage. However, a few species reached high numbers this year and affected a significant amount of forestland. Oak button gall, caused by a tiny wasp in the genus *Neuroterus*, was observed on white oaks in the Piedmont region and caused leaf browning, leaf curling and premature leaf drop. The oak sawfly caused noticeable damage in southwest Virginia, mainly on red oaks. Populations of these native pests are expected to crash over the next couple of years and trees should recover.

The most destructive insect pest of pines in Virginia is a native insect, the southern pine beetle. However, despite causing millions of dollars' worth of damage throughout the southeast since the 1980s, this insect has been relatively quiet the last 15 years. Even a recent outbreak on the Eastern Shore of Virginia that had been active since 2012 seems to be slowing in 2018. Thinning has long been accepted as an effective strategy to reduce a stand's susceptibility to the southern pine beetle; VDOF offers financial assistance to landowners who preform pre-commercial thinning on their pine stands, and to loggers who preform first commercial thinning on small tracts of land. Federal funds from the USDA Forest Service, Forest Health Protection, Southern Pine Beetle Prevention Program support these cost-share programs for landowners and loggers.

Exotic pests continue to spread throughout the state. The emerald ash borer, first discovered in Virginia in 2008, has now been confirmed in more than 70 Virginia counties. This insect is one of the most destructive forest insects to invade Virginia and is causing widespread ash mortality across the state. The emerald ash borer attacks all species of ash and

will greatly impact the approximately 187 million ash trees across the commonwealth. Other invasive pests that continue to negatively affect forest health include the hemlock woolly adelgid and beech bark disease. Monitoring efforts continue for the Asian longhorned beetle and laurel wilt disease, both of which have the potential to cause detrimental effects to Virginia's forest if they become established.

Spotlight on the Spotted Lanternfly

The spotted lanternfly is an invasive insect from Asia that has been wreaking havoc on agricultural crops in Pennsylvania since 2014. In January 2018, this insect was found in Virginia for the first time in Frederick County. It has a strong preference for tree-of-heaven, attacks fruit trees, grapes, hops and a variety of other crops, and is known to feed on commercially-important forest species such as oak, walnut, poplar and pine. The spotted lanternfly is a serious economic threat to the country's grape, orchard and logging industries. Treatments are underway to eradicate the pest from the area of infestation in Virginia.

APPLIED FOREST RESEARCH



VDOF's Forest Research Program strives to develop and communicate timely, relevant information to help landowners better understand, protect and sustain Virginia's forests. This effort has been ongoing for 63 years. The cornerstone of our efforts is collaboration. We leverage our modest resources by building relationships and partnering with universities, other agencies, local and regional groups and private landowners to establish studies across a wide range of Virginia's forest types and collect detailed data. Our studies are science based, structured, controlled and statistically valid to ensure that the results can be interpreted and applied with confidence.

Over the years, this program has contributed significantly to the advancement of forestry practices not only within Virginia, but across the range of our native forest types. Our studies – either alone or in combination with others – have developed techniques for selecting the best species or families of pines and hardwoods to re-establish following disturbances; altering the competing vegetation communities to favor desired crop plants; projecting yields to assist in long-term decision making; restoring diminished species such as longleaf pine and American chestnut; and applying fertilizers to areas where soils are nutrient deficient.

There are 57 active studies at 90 locations scattered across the Commonwealth; nearly 57,000 individual trees on over 950 plots are being periodically monitored for vigor and growth. These efforts can be categorized in five broad subject areas:

Pine Forests

Pine plantations are important to Virginia's ecology and economy and are therefore a high priority for research. In the past year we have collected data that will help us to quantify the value of controlled-release urea fertilizer for application to forest soils; estimate the effects (if any) of thinning and fertilization on the wood quality properties of crop trees; and determine how long after application nitrogen and phosphorus fertilizers remain available to trees.

Several new studies are being initiated this year. One will evaluate the relative performance of our nursery's new containerized pine seedlings compared to the traditional "bare-root" seedlings in plots on several of our state forests. We will collaborate with a PhD student from the Forest Modeling Research Co-op at Virginia Tech to evaluate the use of unmanned aerial vehicles (i.e. drones) to assess the stand conditions (survival, competing vegetation) in young plantations. A third study will involve beta-testing a system developed by scientists with the Forest Productivity Co-op at NC State to interpret soil and geology maps so they are more directly applicable to forest and tree growth conditions. Another trial will test the effects of different levels of competing hardwood competition on the fate of fertilizer applied to pine stands at the time of thinning.

Hardwood Forests

The sustainability of our hardwood resource is another top priority. Our study plots comparing different harvest systems' effect on future forest composition are ongoing, as are our white oak crop tree release plots. A new area of interest lies in the potential for developing desirable hardwood regeneration (particularly oak species) in the understory of thinned (or lower-density) pine stands. The agency's hardwood initiative will begin accelerating in the coming year, calling for new efforts to communicate the accumulated research results from years of study. In an entirely new subject area, we have embarked in the last year on an effort to test the compatibility of honey production with public land management and to determine the value of various native tree species as a food source for pollinators (particularly honey bees). Hives are currently installed and monitored on our Lesesne and Cumberland State Forests and there are plans to place hives on the Channels State Forest next year.



Pine Tree Improvement

Insuring the supply of high quality loblolly pine seedlings for regenerating harvested plantations is a critical effort. Studies have shown that every 0.1 percent increase in growth achieved by tree improvement has an impact of approximately \$14 million on Virginia's economy. As one of the longest-serving and most active members of North Carolina State Cooperative Tree Improvement Program, we installed two new progeny tests again this year. These tests support ongoing selections of the best pine families to plant in Virginia, and bring the total number of active tree improvement test sites to 19. We will continue to evaluate these trees and select those with the fastest growth, best form and most disease resistance for inclusion in our seed production orchards.

Diminished Species Restoration

A large effort was made this year in conserving the remaining native Virginia longleaf pine genotype, as over 265 branch cuttings from 48 of the last parent trees were collected and grafted onto archive trees at the New Kent Forestry Center. Successful grafts will be used to provide future grafting material to complete our seed production orchard. Our American chestnut blight resistance breeding effort also made substantial progress, as 15 crosses including over 560 flowers were control-pollinated. Nuts from these crosses will be planted at our Matthews State Forest and evaluated for possible inclusion in future breeding work based on their blight resistance and appearance.

Growth and Yield Modeling

Tree measurements were collected for five of our 16 active loblolly pine growth and yield studies in 2018. The data from these tests are compiled by the Forest Modeling Cooperative at Virginia Tech and serve as the foundation for the predictive models we use to project the effects of different site conditions and activities on the future of our pine forests. Plans are underway for a large effort by multiple partners to harvest, mill and test the lumber quality produced by 120 mature loblolly pines grown under different thinning, pruning and fertilization regimes. Individual trees will need to be harvested, carefully tracked and transported to a mill in Georgia and then to a laboratory for testing of wood chemistry and strength. VDOF will host the Forest Modeling Research Cooperative's annual meeting this December, including a day-long field tour of many of our research sites on the Appomattox-Buckingham State Forest. The attendees will include our partners and scientists from across the southeastern United States.

More details and results from all of VDOF's Applied Forest Research Program activities can be found on our website at <http://dof.virginia.gov/infopubs/index-research.htm>.



Virginia Hosts Southern State Foresters

Virginia Department of Forestry hosted the Southern Group of State Foresters (SGSF) in our state capital in June 2018. Approximately 200 forestry and natural resource professionals from the southeast states attended this gathering to discuss issues facing forestry and forest industry.

This is an excellent opportunity for several working committees to share information, concerns and ideas about specific areas of forestry: forest health, forest management, forest protection & fire, urban and community forestry and water resources.



FOREST INDUSTRY AND MARKETS



Dubai Wood 2018, Dubai

Record Year for Timber Harvested

Last year was a record year for the volume of timber harvested in Virginia based on analysis of receipts from the Virginia Forest Products Tax:

- ▲ Volume of softwood increased 20 percent – from 7.9 billion to 9.5 billion cubic feet
- ▲ Volume of hardwood increased 9 percent – from 25.7 billion to 28.0 billion cubic feet
- ▲ Growth/drain ratio on commercial timberland improved from 2011 to 2016:
 - Softwoods was 1.4:1, improved to 2.3:1
 - Hardwoods was 2.2:1, improved to 2.6:1

Virginia's forest industry continues to adapt to changes in resources, the economy and world events that have affected the growth and decline of markets both domestically and internationally. The best news is that we continue to attract new businesses, even as some have closed or changed owners, and every indication points to a forest industry that is continuing to increase beyond the \$21.5 billion annual economic contribution and 108,000 related jobs reported in last year's "The Economic Impact of Virginia's Agriculture and Forest Industries" report.

As the economy continues to improve and we see both domestic and international markets for Virginia's forest products grow, we still need to be aware of challenges and issues that impact our forests and forest industries. While some international markets are improving, the strong U.S. dollar and weak economies in other countries continue to change product demands and where products go. Trade, tariff and phytosanitation issues are also affecting a number of international markets. Low energy prices, while beneficial to many, have had a significant impact on biomass energy and fuel use, which is a major market for low-quality wood and residues. On the domestic side, housing (a key indicator of wood demand) continues to recover more slowly than expected; at the same time, changes in demographics, forestland ownership, forestland loss and fragmentation, and changing product demands are increasing concerns on forest resource sustainability.

Based on the latest Forest Products Tax data for fiscal year 2017, we show record harvest volumes overall in Virginia. Although most of the increase was due to the recent addition of mixed chips used mostly for bioenergy and fuel production, there was a general increase in harvest for all products. Other significant changes have to do with hardwood sawtimber, mostly due to increased exports to China. Recent tariff and phytosanitation issues with the Chinese have reduced these exports. Two areas of concern are lack of markets for low quality wood and biomass, and larger pine timber. A combination of low energy prices, increased chip production capacity and improving sawtimber harvests has led to excess production in various areas, while the lack of pine sawtimber markets during the recession led to large volumes of mature pine forests. We are working with state agencies and forest-related associations to identify new markets and opportunities for these products.

Since a prosperous and diverse forest industry depends on healthy, sustainable, working forests, we continue to work with various partners and forestry related-groups to monitor Virginia's forests, engage with private landowners on forest management and implement programs to maintain their health and growth. Some of these activities include implementing parts of the VDOF Forest Sustainability Initiative; working with other state agencies, VA Tech, forest associations and other partners with economic development and educational projects; working with the USDA Forest Service on Forest Inventory and Analysis (FIA) and Timber Products Output (TPO) work, and participating in the Southern Group of State Foresters'

(SGSF) Services, Utilization and Marketing (SUM) Committee.

The VDOF continues to work to obtain new resources to identify and promote emerging markets as well as opportunities to enhance the traditional markets that have been the backbone of the industry. Maintaining diverse markets, cutting-edge technology and a trained workforce are necessary for all forest-related businesses to remain prosperous and relevant in today's world. Working with VDACS' International Marketing Division, we are increasing our efforts to promote

FOREST INDUSTRY AND MARKETS, *continued*



Virginia's forest industry and products around the world to maximize opportunities to participate with and improve access to international customers. In the last year, we have assisted with trade promotions in the Middle East and the International Wood Fair in Atlanta, Georgia. We continue our efforts to expand the Virginia Grown Forest Products program to increase demand for local forest products and to try to increase other Virginians' awareness of the important role that forest products have in their lives. A display on forest products at the 2018 East Coast Sawmill and Logging Equipment Exposition is an example of this work. We continue to work with counties, companies and agencies to utilize state programs – like the Agriculture and Forestry Industries Development (AFID) Fund – to improve opportunities for new or expanding business. Close cooperation with state and local economic development agencies is also important in our efforts to expand forest industry in Virginia. These efforts have led to recent new or expanding industry announcements, including Homestead Building Systems, Speyside stave and cooperage plants and Mountain Top Timber Products.

2018 East Coast Sawmill and Logging Equipment Exposition



International Wood Fair, Atlanta, Georgia, 2018

Working with various agencies, partners and stakeholders, VDOF continues to seek and leverage resources for programs and activities to ensure that forest landowners and industry continue to have markets for their products now and in the future. As part of our efforts to maintain sustainable working forests, we continue to work with partners to improve landowner access to forest certification programs and certified wood markets. Virginia is also working with regional and national partners to educate other countries on the health and sustainability of our forests through articles, meetings and tours. As demands for documenting the sustainability of forest products increase, it is important that our landowners and industry can provide those assurances.

VDOF continues to work with the Center for Natural Capital and other partners on the community wood energy program in Virginia and with the USDA Forest Service-funded State Wood Energy Team (SWET). The goal of the program is to help local schools, communities and industry reduce energy costs and improve job and economic opportunities by converting to biomass energy systems that use local resources and producers, while developing markets for low-quality and waste wood that can improve forest management and health and waste reduction. Several resources, including the website <http://www.woodenergyva.org/>, education materials, project ranking and evaluation tools and technical assistance, have been developed. A new related area that we are looking at is the increased interest in aviation biofuels. Virginia's location and the predicted demand for renewable aviation fuels could lead to a new market for biomass, residues and other low grade wood.

agencies and partners to identify issues that affect the competitiveness of our industry and the sustainable utilization of our forests and begin to address them. Part of this effort will be the development of a State Wood Utilization Team to provide technical, educational and other assistance and resources to address needs.

The third grant will help expand our program on developing uses for urban wood and increasing service providers that can deliver management assistance on small forestland acres and forests in more populated areas. Several workshops and trainings for service providers (including forest operators, municipalities, private and public foresters and arborists) have taken place this past year and more are planned. We have recently developed the Virginia Urban Wood Group in association with Trees Virginia with a website at www.vaurbanwood.org; held

As part of VDOF efforts to improve forests and identify new market opportunities, VDOF applied for and was recently awarded three separate grants. Two of the grant projects will focus on working with forest industry, educational institutes,

FOREST INDUSTRY AND MARKETS,

continued



a Mid-Atlantic Urban Wood Forum in Richmond, and developed additional educational materials, workshops and demonstrations for landowners, service providers, municipalities and other stakeholders. An online Urban and Small Woodlot Forestry Business Directory for interface and small-scale forest landowners has also been created. One of the main efforts of this new grant will be to work with municipalities and tree services to develop a model to better track and quantify urban wood to assist with better management and marketing of wood. These efforts should lead to better small woodlot or community forest management, increasing urban wood use and better ability to address impacts of invasive species and natural disasters in these areas.

VDOF is also working with some regions that have identified forestry and forest products as a significant sector for their local economy to provide resource analysis and other assistance for economic development. We continue to explore additional new markets for Virginia's forest, like cross-laminated timber (CLT) that is increasingly being used in building construction as an alternative to concrete and steel. These large panels can be made from softwoods or hardwoods and offer a great opportunity for additional uses of low-quality lumber. VDOF is working with Virginia Tech, Southern Virginia Higher Education Center, state agencies, forest-related associations and others to increase awareness of this opportunity and to bring the manufacturing and use of CLT to Virginia. Efforts are underway to identify and document Virginia's advantages.

VDOF and the Department of Taxation worked with Virginia's forest industry, associations and stakeholders on changes to the Virginia Forest Products Tax to better reflect current timber harvesting and processing activities. The revenue-neutral changes that took effect in July 2015 contained a new category called mixed chips, which was an effort to better account for in-woods chipping and biomass fuels. The new category accounted for more than 1.8 million tons produced and a tax collection of more than \$90,000. For fiscal year 2017, the Forest Products Tax collected a record \$2,578,047 of tax for use in protecting and reforesting private forestlands in Virginia. With matching funds from the General Assembly, these funds will provide needed resources in our efforts to maintain healthy, sustainable forests and prosperous forest industries.

To be able to provide the needed assistance on forest markets and other forest benefits that landowners, industry and other stakeholders require, the VDOF maintains or has access to information on forest inventory and values, forest industries, new technologies, technical consultants, service providers, agencies and other organizations and other technical support services.

The VDOF Utilization and Marketing Program continues working with partners and other VDOF offices to keep Virginia at the forefront of assisting our forest landowners,



Governor Northam and Secretary Ring celebrate the announcement of the new Speyside Bourbon barrel Cooperage that will be operating in the old Merrillat cabinet factory in Smyth County as well as Speyside's second new barrel stave mill that will be built in Washington County. This is more great news for forestry in Virginia and for the economy in Southwest Virginia in particular.

industry and other stakeholders in being able to take advantage of both the traditional and emerging market opportunities and other forest values, both domestically and internationally. To have healthy, sustainable forests, we need healthy, sustainable forest industries and markets.

URBAN AND COMMUNITY FORESTRY



Community forests provide multiple benefits to Virginia's cities and towns. The Urban and Community Forestry (U&CF) Program helps Virginia communities maintain and enhance their community forests, and raise citizen awareness as of the multiple benefits these forests provide: clean air, clean water, storm water management, community revitalization, community health and wellbeing, business district enhancement, aesthetics and the all-important contact with nature.

The Urban and Community Forestry Program works with communities of all sizes, providing project coordination and networking, technical assistance, educational opportunities, professional development, academic program support and grants for specific projects. Technical assistance such as tree selection and maintenance, riparian planting and restoration, tree/utility issues, urban tree canopy assessment and green infrastructure planning are provided across the Commonwealth. Educational opportunities include workshops around the state as well professional forums in Northern Virginia and Tidewater. The program also provides scholarship opportunities to statewide, regional and national educational events, such as the Mid-Atlantic Horticulture Short Course, the Municipal Foresters Institute, and the Arbor Day Foundation Partner's Conference. VDOF continues to oversee the Tree City USA® program in which 57 communities are currently certified. There are now seven college campuses in the Tree Campus USA® program and three utility companies continue to participate in the Tree Line USA® program. Through the Urban and Community Forestry Assistance Program, VDOF has supported projects in 129 cities and towns, 57 counties and 10 military bases, with 112 non-profit organizations and multiple educational institutions, Planning District Commissions and Soil and Water Conservation Districts since the program's inception. Funding for the program continues to be modest, supported by funds from the USDA Forest Service, but the program is very popular and shows definite positive results.

The Virginia Trees for Clean Water (VTCW) grant program continues to gain popularity.

Through funds from the USFS Chesapeake Watershed Forestry Program and Virginia Department of Conservation and Recreation Water Quality Improvement Funds, VDOF has developed the Virginia Trees for Clean Water program which is designed to improve water quality across the Commonwealth through on-the-ground efforts to plant trees where they are needed most.

Projects include tree planting activities of all types: riparian buffer tree planting, community and neighborhood tree plantings, etc. Grants are awarded through this program to encourage local government and citizen involvement in creating and supporting long-term and sustained canopy cover. There have been 146 active projects with funds totaling \$606,608 being awarded. To date, this has resulted in over 49,657 trees being planted, and over 17,837 volunteer hours logged across the state.

Wallops Island, Tree City USA

Urban Forest Management

Utilization of urban trees removed due to development, storm damage, landscape renewal or any other reason has traditionally been restricted to firewood, mulch or the landfill. This is a major source of woody material that could often be utilized in a more sustainable manner. We have been working with Marketing and Utilization personnel to promote the use of this resource. Some communities have made the effort to develop contracts for the wood to be chipped and sent for biofuel. The Virginia Urban Wood Utilization Group has been developed to raise awareness of urban wood and spearhead the higher use of some of the quality wood. Potential products include boards, custom-made furniture, and crafted items such as bowls, spoons and cutting boards. These resources are waiting to be more sustainably used and we are working to develop the interests and markets for urban wood. With USFS funds for an Urban Wood Utilization project, we are producing promotional videos that follow a tree from removal to finished project in both Harrisonburg and Roanoke. These videos will not only highlight the stories of these trees but also different techniques for drying and processing the wood.

The Urban Forest Strike Teams (UFST) are comprised of specially trained

URBAN AND COMMUNITY FORESTRY,

continued



ISA Certified arborists who assist communities with the classification of damaged urban trees based on FEMA 325 guidelines for the purpose of reimbursement under Public Assistance during the recovery phase of a federally declared disaster. At the same time they provide on-site rapid individual evaluation of trees damaged during a natural disaster that pose a risk to the community. UFSTs are stand-alone resources that use an ICS structure with a UFST Team Leader and UFST Team Leader Assistant directly supervising crews of UFST Task Specialists. Arborists can provide disaster planning assistance, risk assessment, and FEMA Public Assistance information to communities following natural disasters to develop in-state and regional capacity to respond to disasters by providing effective, practical and comprehensive urban tree assessment training to state agency arborists. Virginia currently has eight personnel trained as UFST Leaders and 32 as UFST Task Specialists. Virginia personnel have been deployed to assist communities in Oklahoma, Arkansas and Kentucky after ice storms, in Louisiana after a hurricane, and in-state after a tornado. The UFST hosted a mock disaster in Richmond, this year, which provided opportunities to newly trained UFST collaborators both in-state and from the northeast, to practice rapid tree assessments and to utilize new technologies for data collection.

An emerald ash borer (EAB) treatment program was developed in collaboration with the Forest Health Program. Currently, 56 VDOF staff have been trained on both the soil drench and systemic tree injection treatment options for EAB. VDOF, led by Forest Health, also received federal Landscape Scale Restoration (LSR) grant funding to support a cost-share program for treatment of ash trees. To date, over 112 applications and 609 trees have been approved for funding through the first year of the program. Some of the funded projects include the cities of Waynesboro, Fredericksburg, Alexandria and Roanoke. University of Mary Washington, Hollins University, Montpelier and many private residents also received support.

Partnerships With Universities

Our partnership with Virginia Tech supports the urban and community forestry curriculum in the School of Forest Resources and Environmental Conservation (FREC) and VDOF continues to have representation on the FREC Advisory Board. VDOF also continued its long and productive partnership with the Community Design Assistance Center (CDAC). CDAC continues to provide landscape and environmental planning assistance to communities statewide. Projects completed this year included: Warm Hearth Krootje Healthcare Center Conceptual Courtyard Redesign, Pocahontas Town Park Conceptual Design and Trail Linkage Plan, Hungry Mother Lutheran Retreat Center Expansion Master Plan and the Abijah Thomas House Conceptual Site Master Plan in Marion. At the University of Virginia, the U&CF program continues to provide support to the Virginia Natural Resources Leadership Institute (VNRLI), which focuses on critical natural resource issues, new skills in conflict resolution and collaborative problem solving.

ISA Continuing Education

The U&CF program also supports the Green Lands class dealing with green infrastructure planning on a community or county scale. VDOF also continues to provide assistance to an evolving urban forestry program at Virginia State University.

Green Infrastructure

VDOF continued a strong partnership with the Green Infrastructure Center (GIC) including networking GIC with other state forestry agencies, resulting in green infrastructure initiatives in both the South and Northeast. VDOF received LSR grant funding which currently supports green infrastructure planning and stormwater code audits in Norfolk, Harrisonburg and Lynchburg. The project has worked closely with three communities to show how tree canopy protection and restoration can help with issues such as stormwater compliance, reducing flooding and meeting TMDL targets for impaired waters by linking current and future canopy to goals for water quality. VDOF has provided support for the development of these plans, and these communities are benefiting, not only by receiving these plans, but also from up-to-date urban tree canopy or land cover analyses and comprehensive GIS data to use for planning purposes, and comprehensive planning strategies to help conserve natural assets.



Clinch River Valley Initiative (CRVI)

VDOF, as the initial funder of the Clinch River Valley Initiative (CRVI), remains a long-term partner in this collaborative, grassroots initiative working to make the Clinch River Valley a global destination based on its biodiversity, natural beauty and outdoor recreation opportunities.

This year, with VDOF support, CRVI hosted the Clinch River Youth Summit and awarded four mini-grants to local public schools. All projects had to include an environmentally-focused project to be implemented by the grant winners. Each project included an educational component for younger students, tangible environmental improvements and collaboration with an outside agency. Results were presented at the Environmental Education Symposium hosted in St. Paul. Roughly 80 classroom teachers, non-formal educators and students attended the symposium. In addition, the Save our Streams Coordinator hosted several river clean ups, two training sessions and is recruiting schools for the Adopt-a-Stream Program. More detail about CRVI is provided at: <https://clinchriverva.wordpress.com>

Working With The International Society Of Arboriculture

VDOF has had a long partnership with the Mid-Atlantic Chapter of the International Society of Arboriculture (MAC-ISA) in promoting the Certified Arborist Program. VDOF has more ISA Certified Arborists than any other state forestry agency in the nation. In addition, VDOF hosts an annual training at its Headquarters for prospective certified arborists. This training has resulted in over 500 individuals passing the certified arborist exam since the training was first offered in 2000. VDOF also provides continuing education units (CEUs) for ISA certified arborists at all of its education events. VDOF provides scholarship funding to MAC-ISA for the ISA certification study course and the tree risk assessment qualification course.

Each year MAC-ISA presents its Gold Leaf Award to deserving landscape beautification and Arbor Day projects. In 2018, one VDOF assisted project was the recipient of the award:

- ▲ Town of Purcellville for their continuing outstanding Arbor Day activities and outreach in the community through tree walks and other outdoor activities.

Trees Virginia (Virginia Urban Forest Council)

VDOF continues its strong and longstanding partnership with Trees Virginia (the non-profit Virginia Urban Forest Council). Together with Trees Virginia, VDOF hosts triannual roundtables in northern Virginia and biannual roundtables in southeast Virginia attended by local urban forestry professionals from municipalities, as well as interested citizens and Tree Stewards. These roundtables have been tremendously successful and

Waynesboro Urban Tree Health Care Workshop

continue to draw a sizable audience for both education and networking. Again in 2018, Trees Virginia and VDOF made major contributions to the Mid-Atlantic Horticulture Short Course (Virginia's major conference for green industry professionals), providing both speaker contacts and numerous scholarships for participants. The partnership with Trees Virginia also continued with the very successful and long-running Waynesboro and Roanoke workshops. Proceeds from these workshops are used to fund scholarships in both urban forestry and horticulture programs and \$4,000 was awarded in 2018. Trees Virginia also continued its practice of offering a scholarship to the national Municipal Forest Institute. The volunteer Tree Steward component of Trees Virginia continued to grow with several groups seeing significant increases in membership. Trees Virginia also sent representatives from local municipalities and Tree Steward groups to the Arbor Day Foundation Partners in Community Forestry Conference in Tulsa, Oklahoma.

ACCOMPLISHMENT REPORT

July 2017 - June 2018



Objectives	Target Goal	Accomplished
Goal 1: Protect the citizens, their property and the forest resource from wildfire.		
Measure 1.1.1: Percentage of wildfire responses that are 30 minutes or less	86%	84%
Measure 1.2.1: Percentage of eligible rural volunteer fire departments receiving available state and federal financial assistance	27%	26%
Goal 2: Protect, promote and enhance forested watersheds, non-tidal wetlands and riparian areas.		
Measure 2.1.2: Percentage of harvest sites with sediment not reaching streams	95%	100%
Measure 2.2.1: Cost to conduct a forest harvest water quality inspection	\$4.50/acre	\$5.75/acre
Measure 2.2.2: Percentage of Best Management Practices properly installed on timber harvesting operations statewide	90%	95%
Goal 3: Improve the stewardship, health and diversity of the forest resource.		
Measure 3.1.1: Number of acres of trees planted in Virginia	44,500 acres	53,706 acres
Measure 3.1.2: Number of acres funded by Reforestation of Timberlands Act financial incentives	50,000 acres	43,115 acres
Measure 3.3.1: Number of acres of all forest management plan types achieved on private and appropriate public forestland	193,764 acres	157,459 acres
Measure 3.2.1: Number of communities assisted with forest and/or tree resource management	120 communities	129 communities
Goal 4: Conserve the forest land base.		
Measure 4.1.1: Number of acres protected from conversion to development	5,250 acres	7,018 acres
Goal 5: Promote forest industry and diversified markets for forest landowners including ecosystem service markets.		
Measure 5.1.1: Number of new and/or expanding forest-related businesses or markets	4 markets/businesses	3 markets/businesses
Measure 5.3.1: Percentage of customers who rate the quality of VDOF's seedlings as satisfactory	96%	98%



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