Virginia Department of Forestry

Kinner Ingram

Senior Area Forester

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Who we are?

- State agency dedicated to protecting and developing healthy sustainable forest resources for Virginians.

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How do we get there?

- Wildfire Suppression
- Forest Health
- Legacy & Land Conservation
- Forest Stewardship & Management
- Urban Forestry
- Tree Nursery Program
- State Forest System
- State Own Lands Program
- Forest Inventory Analysis (FIA)
- Water Quality
- Forest Research
- Tree Improvement
- Forest Products Marketing
- Conservation Education
- All other duties as assigned…

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Healthy Forest = Managed?

- Forests are the natural land cover in Virginia.
  - Influenced by:
    - Soil, Weather, Diseases, Fire (Disturbances)
- What elements can we control?

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About Us

- Serve as a local forest management experts, trusted public advisors, and stewards of the Forest to assist landowners, forestry professionals, government agencies, and partner organizations.

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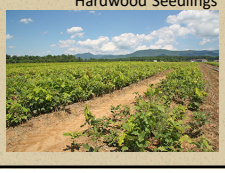
Manage State Lands and Nurseries

Pine Seedlings

Hardwood Seedlings



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Protection from Wildfires

- Primary Goal:
  - Preventing injury or loss of life, minimizing property damage, and protect forest resources.
- Nearly all wildfires are human caused in Virginia. (Intentional or not)

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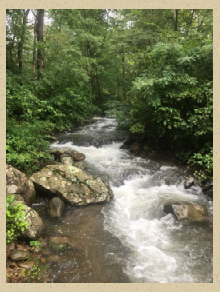
Water Quality



- Forest conservation is one of the most effective measures to protect water quality.
- VDOF has been involved since the 1970's when Forest BMP's for Water Quality were developed.

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Services We Provide to Landowners

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Site Visits

- Most management journeys start with a site visit.
- We will visit properties to walk and talk with landowners to figure out how we can get you what you want from your property.
- From there we can assist in developing a plan(s) for your property.

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Types of Plans

Stewardship Plans

- Our most comprehensive plan that serves as the foundation for connecting landowners with their forestland.
- Address landowner objectives.
- Optimal for landowners with multiple objects and a desire to manage their land for multiple purposes.
- Included a very thorough appendix when plan is delivered.

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Types of Plans

Stewardship Plan

- Elements can include:
  - Soil and Water
  - Bio diversity
  - Agroforestry
  - Aesthetic quality
  - Recreation
  - Wood and fiber production
  - Fish and wildlife
  - Endangered species
  - Forest Health (Invasives)
  - Wetlands
  - Fire
  - Conservation based estate planning
  - Carbon sequestrations
  - And more….

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Types of Plans

Land Use Plan

- Concise 1-2 page plans that include very brief information about the present forest stands, soils, and includes general forest management practice recommendations.
- Developed to meet the planning requirements for taxation purposes in counties.
- Cover all forested acres on a tract.

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Types of Plans

Stand/Practice Plan

- Management plan for a single stand/area of a tract, particular management concern, or landowner area of interest.
- Address a more immediate need, can be the first step to a more comprehensive plan in the future.

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Types of Plans

Pre-Harvest Plan

- Based on standards for BMP's.
- Include Maps
  - Skid Roads, Haul Roads, Crossings, Deck Locations, Concern areas.
- Recommendations for post harvest work as well.

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Types of Plans

Cost-Share Plans

- Make recommendations for specific practices that are covered by state or federal cost-share programs.

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Selling Timber

- Learn the resource, Plan, and Act
- Speak with a forestry representative BEFORE timber sales are made.
- If you start planning after the harvest is complete you are behind.

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Legacy and Estate Planning

- VDOF and its partners offer resources to assist landowners in long-term plans for their properties.
- Generation Next
  - Partnership developed to help family forestland owners make decisions regarding passing their land forward.

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Easements

- Voluntary legal agreement that permanently limits future development.
- Ensures land preservation in perpetuity.
- You can help set terms.

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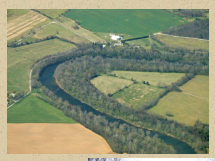
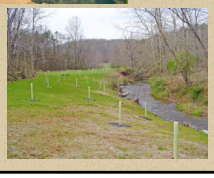
Riparian Buffers

- More than 50% of Virginia's freshwater originates from forests that cover 2/3's of the state.
- One of the best ways to maintain water quality.





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Water Protection on Farms

- What can farmers do?
  - Promote forested buffers.
  - Keep livestock out of stream.
  - Reduce ag runoff and soil erosion.
- Cost-share programs out there to help farmers accomplish some of these goals.

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Hot Topic
(Prescribed Fire)

- Good vs. Bad Fire
  - Some species/ecosystems need fire
  - Historically Virginia burned every few years.
  - Removal of Fuel - Reduces impacts of wildfires.
  - Animals like the shrubby habitat and fruit bearing species that come in after burns.
- Bad Fire
  - Health Concerns
  - Property Concerns
  - Costly (Literally)

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Burning Questions

Thank you all for having me!

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Virginia Department of Forestry

Forest Management and Why It Is Important

Forests are the natural land cover of Virginia, and are influenced by soils, rainfall, storm events, insects, diseases, and wildfire and controlled fire. Forests are essential to our wellbeing. They provide wood for a multitude of products, food, shelter, and cover (habitat) for birds, animals and insects. Forests intercept rainfall, slow it down as it soaks into the layers of leaves on the ground, and prevents soil from washing into creeks, streams, and rivers, keeping water clean. Forests also take in carbon dioxide and release oxygen, in effect cleaning the air, and provide cooling shade on hot days. Finally, forests are beautiful, providing attractive landscapes and settings for outdoor recreation.

Good management can be described as a wise use of one's resources and abilities to accomplish a successful outcome. Forest management – applying practices or treatments to the forest – helps to achieve specific forest benefits for the landowner and in turn can help meet the needs of everyone living in Virginia. Forest management practices are based upon the science of how different types of trees and forests grow. Skillfully applying these practices helps the landowner meet their forest management goals and objectives in ways that are effective and efficient. Professional foresters are trained to help landowners by developing plans and applying forest management practices that will achieve the desired objectives and benefits.

An example of this process is "thinning." Most trees produce an abundance of seeds, so new forests often have lots of young trees growing close together. Naturally, over time, the strongest trees outgrow the weaker ones that eventually die, but it can take a very long time for this to happen. A forest management practice called "thinning" is where the best trees are selected to stay, and the others are removed. By doing this, the best trees have lots of room (sun and moisture) to grow better, faster, and larger than they would without this treatment. The result of management is a healthier forest and one that is likely more valuable.

Who we are?

A state agency dedicated to protecting and developing healthy sustainable forest resources for Virginians.

What we do?

VDOF has a number of program areas, each focused on a specific aspect of forestry. These program areas are administered at the agency headquarters level, with a majority of the projects and activities conducted through our field staff assigned to the three operational regions. Program areas include:

- Wildfire Suppression, Prevention and Public Safety
- Forest Health
- Forest Legacy and Land Conservation
- Forest Stewardship & Management
- Urban & Community Forestry
- Forest Inventory and Analysis (FIA)
- Water Quality Protection
- Forest Research

- Tree Improvement
- Forest Products Marketing and Utilization
- Conservation Education
- Tree Nursery Program
- State Forest System
- State-Owned Lands Program

Agency Priorities

Manage and Conserve Virginia's Forest Resources

The agency's mission is to protect and develop healthy, sustainable forest resources for Virginians. To achieve this mission, VDOF staff work with private landowners, forest industry professionals, government agencies and partner organizations to manage, conserve, and grow Virginia's forests and tree canopy. Our staff members serve as forest management experts, trusted public advisors, and stewards of Virginia's invaluable forest resources. VDOF is also responsible for administering a number of community grants, landowner incentives, and cost-share programs that support sustainable forest management across the Commonwealth.

Manage State Lands and Nurseries

Virginia's state forest system serves as a demonstration of sustainable forestry management. All of Virginia's state forests are certified to the standards of the Sustainable Forestry Initiative (SFI) and American Tree Farm System (ATFS). These certified forests cover more than 68,000 acres.
Read more about Virginia's commitment to practicing sustainable forestry with our state forests.
VDOF forestry centers house orchards and nurseries where VDOF cultivates, grows, and sells the best seedling stock for Virginia's climate and landscape.

Protect Virginia's Forests from Wildfire

VDOF is charged with the protection of the forest resources from wildfire. The primary goals of the agency's forest protection program are preventing injury or loss of human life, minimizing property damage, and protecting forest resources.

In Virginia, nearly all wildfires are caused by people, whether it's intentional (arson) or unintentional (e.g., escaped debris burning). Through proactive wildfire prevention programs, such as youth education and homeowner outreach, the agency is able to mitigate the leading causes of wildfire.

Early detection, well-trained personnel, and modern equipment are key elements in the agency's suppression efforts. The training and equipment required of VDOF's field staff for emergency fire response can be equally applied to non-fire disasters and emergency situations, such as storms, flooding and ice damage.

Protect Virginia's Waters

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. VDOF has played an important role in the protection of our forested watersheds since the early 1970s when the first set of Forestry Best Management Practices (BMPs) for Water Quality were developed.

The agency is tasked with promoting and enforcing the Virginia Silvicultural Water Quality Law (Code of Virginia *§10.1-1181.1 – 1181.7*), developing BMPs for forest harvesting operations, and working

cooperatively with agencies and landowners throughout the Commonwealth to preserve riparian buffers and protect water quality –from rivers and streams to the Chesapeake Bay.
Two of VDOF's performance measures involve water quality. One focuses on BMPs on forest harvesting operations and protecting streams from sediment. The other focuses on protecting and improving watersheds through forest management and land conservation.

Site Visits
Most journeys with landowners start with a site visit. A forester will come to your property, walk the property with you, discuss management goals, and figure out where to go from there. Often times a site visit gets followed up by a plan. We have many different types of plans, some being Stewardship, Land Use, Pre-Harvest, Planting, and Cost-Share Plan.

Plans

Stewardship Plan

A Forest Stewardship Management Plan serves as the foundation for connecting forest landowners with their forestland through a comprehensive plan that addresses individual landowner objectives for their entire property. This plan type is the most comprehensive and takes a holistic approach to forest management for a landowner's entire property, and is highly recommended for landowners wishing to address all resource aspects of their land. Forest Stewardship Management Plans are optimal for landowners with multiple objectives and a desire to successfully manage their land for multiple purposes. These plans must adhere to National and State Forest Stewardship Management Plan guidelines. Forest Stewardship Management Plans developed by VDOF staff incur a nominal fee, which is dependent upon the size of the property.

Plan Criteria
All Forest Stewardship Management Plans must:

- Be prepared or verified by a professional resource manager, and be approved by the State Forester or a representative of the State Forester.
- Document authorship and landowner information, as well as contact information.
- Include detailed location, plan and soils maps.
- Clearly state landowner goals and objectives.
- Describe current forest condition.
- Describe desired forest condition.
- Include practices and activities aimed at reaching the desired forest condition or condition class.
- Include detailed recommendations and a timeline for practice implementation.
- Describe any suggested monitoring activities to be done by the forester or landowner.
- Be developed for a specified management period that adequately allows for progress with the landowner's long-term stewardship objectives.
- Be reviewed, renewed, revised, or rewritten at the end of the specified management period or sooner as needed, to be considered current.

Plan Elements
The plan preparer will consider, describe, and evaluate plan elements and their importance to the ownership when they are present. Plan elements to be considered include:

- Soil and water
- Biological diversity

- Agroforestry
- Aesthetic quality and desired species
- Recreation
- Wood and fiber production
- Fish and wildlife
- Threatened and endangered species
- Forest health and invasive species
- Conservation-based estate planning / legacy planning information
- Archeological, cultural, and historic sites
- Wetlands
- Fire
- Carbon sequestration
- Forests of Recognized Importance (FORI)

May include additional appendices, such as:

- Descriptions of assistance available and financial incentive programs
- Description of Conservation-based estate planning and a list of available resources
- Educational materials
- A glossary of terms
- An explanation of applicable federal, state, and/or county regulatory programs, especially as they apply to: archeological, cultural, and historical sites; wetlands; and threatened and endangered species.

Landowners requesting a Forest Stewardship Management Plan must submit a signed Form 7.10 Forest Stewardship Program Application to the VDOF.

Land Use Plan

Land-Use Plans are concise one- to two-page plans that include very brief information about the present forest stands, the soils, and also include general forest management practice recommendations. They are developed to meet the planning requirements of some counties to participate in use-value taxation programs. The plan will cover all forested acres on a contiguous tract. Land-use plans do not contain sufficient detail to qualify for cost-share programs, and are not equivalent to Tree Farm Plans and Forest Stewardship Management Plans. Land-Use Plans developed by VDOF staff incur a nominal fee.

Plan Criteria

Land-Use Plans may be in narrative format and should:

- Document authorship and landowner information, as well as contact information.
- Briefly describe existing conditions of the forest stand.
- Briefly describe the soils.
- State landowner objectives.
- Include general forest management practice recommendations.
- Include a map of the property.

Pre-Harvest Plan

Pre-harvest plans are specific plans developed to assist landowners and/or logging contractors to minimize the potential impact to soil and water quality when conducting a timber harvesting operation. The plan is based on standards in the Virginia's Forestry Best Management Practices (BMP) for Water Quality – Technical Guide and will identify recommended best management practices. VDOF staff can

develop these pre-harvest plans, while loggers or logging managers generally prepare the actual harvest plan.

All Pre-Harvest Plans should:

- Document authorship and landowner information, as well as contact information.
- Include a detailed harvest site map identifying harvest boundaries, water features, and streamside management zones, as well as recommended logging deck, haul road, and skid trail locations.
- Include recommendations for layout of haul roads, landings, decks, and skid trails.
- Include recommendations for stream crossing structures, design and installation.
- Identify potential problems areas, such as fragile soils or steep slopes, and streamside management zones that may require special treatment during the harvesting operation.
- Include recommendations for post-harvest soil stabilization and revegetation practices, and other best management practices.

Practice/Stand Plan

Practice Plans are management plans for a single stand or area of a tract, particular management concern, or landowner area of interest. These single-resource plans are valuable in addressing more immediate landowner needs and can be a first step to more comprehensive planning in the future. The plan can include small incidental areas (example Special Management Zones) that may be associated with the stand or area of interest. A Practice Plan is not generally developed for an entire tract unless the tract is small and/or supports one timber type that will be managed as a single parcel. Practice Plans are often used to document existing conditions and make management recommendations for federal or state cost-share programs.

Plan Criteria

All Practice Plans should:

- Be prepared by a professional forest resource manager.
- Document authorship and landowner information, as well as contact information.
- Include property identification and location information.
- Clearly state landowner objectives.
- Describe existing site conditions.
- List any recent management activities.
- Include detailed management recommendations.
- Include a detailed map of the property.

Cost Share Plan

Cost-Share Plans are single-resource management plans that state objectives,
current stand characteristics, and make specific practice recommendations for practices that are covered under a state or federal cost-share program. Check the requirements of the specific cost-share program being considered to verify whether a multi-resource Forest Management Plan or a single-resource plan type is required for participation. Check with your local county forester for more information about cost share programs available in your area.

Plan Criteria
Cost-Share Plans may be in narrative format or on a specific program form, and should:

- Document authorship and landowner information, as well as contact information.
- State landowner objective.
- Describe existing conditions.
- Include detailed management recommendations.
- Include a map of the property.

Community Forest Management Plan
This goal is to provide a plan to a total neighborhood, subdivision, community, or part thereof to achieve resource objectives. Numerous individual ownerships may be included. VDOF staff would communicate with a community representative (s) with authority to request the plan and provide objectives. Areas covered could include commonly-owned areas, as well as private land. A field examination is expected, but may or may not extend to the individual tax parcel level. This type of plan could be integrated with woodland home community fire mitigation plans.

Selling Timber

Forests provide many benefits to the Commonwealth and to the thousands of people and businesses that own the land. Timber sales provide revenue for landowners and drive businesses like logging, milling, trucking, and manufacturing. Trees can take a long time to grow and many landowners may sell timber infrequently or only once in their lifetime, so it's important to learn and plan carefully before acting.

Pause and Learn
Selling timber is a business and financial transaction so it is important to apply sound business practices when selling timber. One of the most important steps a landowner can take is using a sales agreement or contract which spells out all of the terms of the transaction and the expectations of both the buyer and the seller. Timber sale terms like length of time; what timber is being sold; how much, what units of measure; amount, method and timing of payment; insurance and liability; access to the timber; care of roads, fences, and condition of land are all very important. It is also essential for the landowner to understand the tax implications of a timber sale.

Plan
A timber sale is an action that should be a part of a larger plan for the forest. Professional foresters are an important resource to landowners in developing plans that will help them meet their objectives. Private consulting foresters can provide an inventory of the forest stand so landowners know what they have before they sell, estimate its value, market and sell the timber, and administer and monitor the timber sale. Consulting foresters are experienced professionals who are involved in these processes daily and can work as an advocate for the landowner. Studies show that landowners that use the services of a professional forester receive higher timber sale revenue. The landowner, timber owner, and buyer all hold responsibility to ensure compliance with Virginia's forest laws.

Act
It takes both a seller and a buyer for a timber sale transaction. Timber buyers can be loggers, brokers, or mills. There are a number of different timber sale business methods which vary depending upon the amount and type of product, as well as the needs of the seller and the buyer. Common types of sales are a lump sum payment, payment by unit of timber cut, or a percentage of the value based on the amount paid by the mill. There can be advantages and disadvantages to each of these types of sales. So, pause and learn more, plan well, and then act.

Forestland Conservation
Virginia is fortunate to have abundant forestland that sustains the Commonwealth's economy, rural communities, and overall environmental health. From the mountains to the Bay, intact managed forests provide substantial benefits to Virginia's people and natural communities.

Unfortunately, rapid population growth and expansion put these forests and their benefits at risk. Each year, significant portions of Virginia's forests are converted to other uses, primarily for development. Conversion of forest acres, as well as the fragmentation of the remaining acres, reduces the potential of the forestland base to provide economic, social, and ecological benefits.

The Virginia Department of Forestry (VDOF) is committed to slowing the loss of valuable forestland to non-forest land uses. Because forest conversion results from the choices of individual landowners, VDOF works with landowners to help them keep their land in forest.

Landowner Options for Forestland Conservation
Across the Commonwealth exists a mosaic of family forest and farmland. Forestland conservation is a landscape-scale effort achieved through the cooperation of the individual landowners that steward the majority of Virginia's forested properties. Your forest can be a critical part of conserving Virginia's beautiful, valuable forestland, but each family or landowner has unique circumstances and visions for their land. You can find a path to forest conservation that works for you. Conservation doesn't happen by chance – it takes planning to protect forests in perpetuity. VDOF and our partners offer resources to help landowners take the first steps toward making long-term plans for their properties.

Legacy and Estate Planning
Managing a healthy, productive forest is inherently a long-term commitment, and most forests will long outlive their current owners. Landowners must consider what will happen to the property that will outlast them. Typically, this involves transferring the land to the next generation, but this requires planning and dedication.

The Virginia Department of Forestry (VDOF) encourages landowners to engage with the ongoing process of legacy planning for their forest properties. Legacy planning involves educating and connecting with the next generation of land stewards for the family property.

As a landowner, you're responsible for passing on the stewardship values associated with your land. These values can inform the decisions made about the property long into the future. Engaging the next generation in your property management builds a strong foundation for the eventual change in ownership.

Legacy planning is not a one-time action. These efforts can – and should – be ongoing and may evolve with the family over time. Legacy planning includes both the practical plans for the land transfer as well as what you hope future generations will prioritize for the property.

Estate planning is a more specific tool within the broader category of "legacy planning". Estate planning typically involves coordinating legal and financial expertise to identify how the property will be transferred and managed in the future. Through estate planning, landowners may engage with attorneys and/or financial advisors to prepare legal documents and accounts for your estate (including all personal assets such as your land). These consultants can best help you apply appropriate legal and financial structures when they understand your goals.

Planning for the long-term future of your forested property goes beyond drafting legal and financial documents – although these are important planning tools, too. Communication and engagement build the values and knowledge necessary to properly manage a forest legacy.

Generation Next

Family forestland is most at risk of parceling and fragmentation, and possibly passing out of forest use or even family hands, at the time of intergenerational transfer. Respondents to a 2018 Benefits and Barriers Analysis in Southside (Virginia) overwhelmingly expressed a desire to keep their family woodlands intact, in forest, and in family ownership; yet 79% of them had not developed a succession plan. The full report is available in additional resources below.

Virginia's Generation NEXT program – a collaboration between Virginia Cooperative Extension and the Virginia Department of Forestry – is an outreach program specifically designed to help family forestland owners make informed and intentional decisions regarding passing their land forward to the next generation. Generation NEXT workshops provide landowners with necessary tools and resources as they begin planning for intergeneration land transfers.

The comprehensive publication Legacy Planning: A Guide for Virginia Landowners was published in 2020 as an invaluable supplementary resource to the workshops provided by the Generation NEXT program. The guide provides a step-by-step overview for planning land transfers and features landowner stories as case studies.

Conservation Easements

Conservation easements are just one of the many tools a landowner may employ to conserve their property long into the future.

A conservation easement is a voluntary legal agreement between a landowner and a government agency or land trust that permanently limits future development of the land to protect its conservation values. When landowners elect to donate an easement on their property, the terms are negotiated between the landowner and the organization that will hold the easement.

Under a conservation easement, landowners continue to own, use, and control their land, and can sell it or pass it on to heirs. Easements allow for and encourage rural land uses, such as forest management, agriculture, hunting and fishing. An easement does not require landowners to provide public access to their land.

A conservation easement protects land primarily by limiting the number of times the property can be subdivided. However, depending on the size and nature of the property, and the conservation values being protected, landowners often can retain the right to exercise one or more subdivisions. Conservation easements also include provisions for building homes, farm buildings and other structures typically found on rural land.

Easements are perpetual in nature – they protect the land forever. The terms of the easement apply to all future landowners, and the organization holding the easement is responsible for ensuring the easement's terms are followed.

Benefits of a Conservation Easement

The primary reason landowners donate a conservation easement is to preserve their land in its natural state, while still allowing their family to live and work on the land. Many want to see their legacy of farm or forest management continued for their children and subsequent generations. Most value the peace of mind knowing that their land will always be protected from development.

In addition, there are significant income tax and estate planning benefits. A gift of a qualified conservation easement in perpetuity may qualify as a non-cash charitable gift, which may yield a deduction for federal income tax purposes, a credit for state income tax purposes, local property tax reductions and federal estate tax exemptions.

Conservation Easements with the Virginia Department of Forestry

The Virginia Department of Forestry (VDOF) holds open-space easements, regularly referred to as "conservation easements", on managed forests across the Commonwealth. Conservation easements are legal agreements, voluntarily entered into by landowners and held in partnership with an easement holder, that limit future development and protect conservation attributes of a property. There are many organizations in the state that can hold conservation easements, including VDOF and other state agencies, the Virginia Outdoors Foundation, and local land trusts. A VDOF forest conservation easement is similar to conservation easements held by other organizations, except that VDOF easement terms are primarily developed to protect forestland, wetlands, and water features and to guide long-term natural resources stewardship.

Most Virginia landowners pursuing conservation easements complete the transaction as a donation, which may qualify as a charitable gift under federal and state tax laws, allowing the grantee to obtain a federal tax donation or Virginia state tax credit. In some cases, the VDOF can work with landowners and/or their representatives to pursue competitive grant-funding opportunities to compensate landowners for a portion of the easement's value.

The VDOF conservation easement program prioritizes larger blocks of working forest that provide the greatest range of benefits. The focus remains on keeping the forestland intact and undivided, enabling landowners to manage their forestland for timber products and environmental values.

Water Quality Protection

Forests Protect Water

Forests play an important role in providing clean water. More than 50% of Virginia's freshwater resources originate from forests that cover about two-thirds of the state. In addition to providing clean water, forests also absorb rainfall, refill groundwater aquifers, slow and filter stormwater runoff, reduce floods, and maintain watershed stability and resilience.

Benefits of Streamside Forests

Forests are highly important and effective at keeping Virginia's waters clean. Trees and forests near streams and waterways are even more important. Tree roots hold tightly to soil, keeping it in place and preventing soil movement or erosion. The tree canopies and the leaves on the ground intercept rainfall and slow it down allowing the excess nutrients or other pollutants to be filtered out of the water. Streamside forests provide shade that keeps water temperatures lower and more suitable for aquatic life in the stream. Leaves that fall in the water provide food for small insects and other organisms that in turn are food for fish and other stream life. Trees along streams and adjacent areas allow a place for floodwaters to dissipate, slow, and drop sediment. Finally, streamside forests provide excellent habitat – food, cover, nesting, and travel corridors – for wildlife.

Two types of streamside forests are of particular importance: streamside management zones and riparian forest buffers.

Streamside Management Zones

Timber harvesting is an important part of Virginia's economy, providing income to landowners, employment for loggers, and wood to support a vibrant forest industry. Best Management Practices (BMPs) are activities utilized by loggers that reduce the chance of soil erosion that may enter waterways. Streamside Management Zones (SMZs) are areas adjacent to streams where all, or a portion of the trees are retained when the surrounding timber is harvested. These uncut or partially-harvested areas provide the benefits of stabilizing soil, capturing sediment, and furnishing shade and cover.

Riparian Forest Buffers

Establishing new riparian forest buffers on open land where they don't currently exist, or expanding existing buffers provide many of these benefits. Examples are streams that flow through farm or pasture land, lawns, or commercial or industrial areas. Converting these open lands to new forests by tree planting or natural seeding will check erosion, soil movement, provide shade and habitat, and slow floodwaters.

Water Protection on Farms

In early settlement days, new Virginia landowners carefully selected their homestead sites where there was a woodlot and a stream somewhere on the property. Water was essential for drinking and agriculture; forest was essential for lumber to build a home and outbuildings on the farm; and cleared areas were needed to sow the crops for the family and cattle. This is when the land use and clean water became unbalanced – it is easy to see how the purity of stream water declined. This is all understandable – streams are important to agricultural landowners as a source of water for the household, the cattle, and for crops. Landowners and farmers strive to be good stewards of the land – their livelihood depends on it.

Forested Buffers

The good news is that we've learned a lot about water quality and how trees can improve water quality since the early settlement days. Without trees, the banks of the streams and rivers are vulnerable to erosion of soil that ends up in the stream. A buffer of trees along a waterway slows down surface flow and filters fertilizers and chemicals through the uptake of these pollutants by their root systems.

Livestock Impact on Streams

Another practice that accelerated the decline of stream/river water quality was to allow livestock free access to the stream for drinking water. As the cattle access the stream, the vegetation on the bank is trampled leading to erosion. Animal waste is concentrated in the water endangering the health of the herd.

Agricultural Impact on Streams

Crop farmers have a different water resource issues to deal with than livestock owners. The pesticides, fertilizers, and soil erosion related to productive cropland are also hazards to clean water for landowners and the community.

How to Improve Water Quality on Your Farm

Through observation and education, landowners have the opportunity to learn best management practices (BMPs) that can improve water quality and lessen the negative influences of the past. Fencing livestock out of the stream to limit or deny access is a good start. Virginia Tech research teams have found that there is less disease when cows and their calves are not drinking stream water contaminated with feces, pesticides, fertilizers, and other pollutants. Planting back trees and other vegetation on the streambank is another BMP. Soil erosion is reduced or eliminated on well-vegetated banks.

The U.S. Department of Agriculture has developed cost-share programs that assist landowners with putting best management practices on their land for the protection of water quality. Forested buffers, cover crops, manure management, and providing alternative water resources for cattle are among 50 such practices. For the specifications to get good BMPs on the ground, visit Soil and Water Conservation District programs and services.

The cost-share programs have alternative water sources associated with the fencing and tree planting programs. There are also modest maintenance payments that help with any damage to fences and equipment from storms and flooding. For landowners that don't have streams, alternative water sources like water stations set up with wells may be an option.

Ponds can also help provide water resources for livestock and irrigation of crops. Help from water resource engineers who can be involved in design and plans for effective ponds will prevent failures in implementation.

For crop farmers, the use of cover crops and terraces as well as crop rotation help reduce soil erosion. No matter what type of agriculture a landowner practices, having a sensitivity to clean water resources is important.

Agencies that assist agricultural landowners realize that incentives to do the right thing are important. While economics are a large part of decisions, often, doing the right thing is a major incentive as well. The Virginia Department of Conservation and Recreation sponsors a ”Virginia Clean Water Farm Award” and the “Bay Friendly Farm Award”, which are presented to landowners in recognition for doing their part to preserve water quality and also encouraging others to do the same. Look for the Clean Water Farm sign as you drive through the rural areas of Virginia and thank the landowners for keeping Virginia’s waterways clean.

Assistance may be available to assist agricultural landowners with their efforts to protect water quality, such as planting riparian buffers, animal-activated watering system connected to a well, fencing, and more.

Riparian Buffer Tax Credit

One of the most effective forestry best management practices to protect water quality is the streamside buffer. Landowners who harvest timber and retain a streamside buffer may be eligible for a tax credit for a portion of the value of the timber retained as a buffer. The amount of the credit is equal to 25% of the value of the timber retained as a buffer up to a maximum of $17,500 in the tax year in which the harvesting operation is completed.

Who is Eligible

- Individuals, partnerships, S-corporations, family partnerships, grantors, trusts, and limited liability corporations. Must be a Virginia tax-paying landowner.
- The tract must be at least 10 acres in size (including contained buffers).
- If the riparian forest buffers belonging to the same landowner cross the state boundary, only the portion contained within the state boundary will qualify for the tax credit.
- The applicant’s harvesting operation must be complete to qualify for the tax credit.
- The applicant is eligible for the tax credit for the tax year in which the harvesting operation was completed. Any unused portion of the tax credit may be carried over for up to five additional years of until completely used.

Buffer Specifications

- The riparian buffer must be at least 35 feet wide and no greater than 300 feet wide.
- At least 50% of the crown cover must remain following the harvest.
- All waterways of the Commonwealth are eligible and must follow the stream designation as identified in the “Forestry Best Management Practices in Virginia” Technical Guide.

To Apply

The applicant must provide the following information to the local Virginia Department of Forestry (VDOF) Forester:

- Completed Application for the Riparian Forest Buffer Tax Credit form (Form 18.8)
- Application fee
- Proof of land ownership (tax bill, copy of a title or deed, etc.). If multiple owners, the percentage of ownership of each landowner
- Copy or proof of a VDOF-approved Forest Stewardship Management Plan for the tract

- The value of the timber retained in the buffer either by a timber cruise of the retained buffer or the average per-acre value of the timber harvested for a prorated timber value based on acreage
- Specific description of the buffer(s), including location and dimensions;
- Map of the riparian forest buffer(s)

Wildland and Prescribed Fire

Fire can be both a good and bad force in the forest. Under controlled conditions, the benefits of fire in forest and ecosystem management are great. Under uncontrolled conditions, fires can be disastrous. Prevention and suppression of wildfires is a key part of the Virginia Department of Forestry's (VDOF) mission; the agency achieves this through education, as well as responding to and suppressing wildfires. VDOF responders suppress more than 700 wildfires each year, protecting forests and property. Fire can be an important component of healthy landscapes, but in developed landscapes, fire can also be devastating, causing loss and harm to people and property. Managing fire in the landscape is critical to maintain healthy forestland and safe communities.

These same individuals who suppress wildfires also use fire as a management tool, completing around 4,000 acres of prescribed or controlled burning to benefit Virginia ecosystems.

VDOF's wildfire prevention program is also going strong. Almost all wildfires in Virginia are caused by humans – therefore, almost all wildfires are preventable. With this in mind, VDOF places much emphasis on preventing wildfires through awareness and educational programs, working with youth, adults, and communities. Prevention is our best defense against wildfires!

Wildfire in Virginia

The Virginia Department of Forestry (VDOF) is charged with the protection of Virginia's forest resources from fire. The principal goals of the agency's resource protection program are to prevent injury or loss of human life, minimize property damage, and protect resources. The VDOF has a well-defined and organized team, with every member of the agency having fire responsibilities.

The ability to adapt to emergencies enables a small formal fire suppression force to limit annual fire losses to an average of 700 fires which burn just under 9,500 acres (10-year average). Each year in Virginia, more than 60 homes and other structures are damaged or destroyed by wildland fire, although agency suppression efforts are credited with directly protecting more than 460 homes and 280 other structures, collectively worth more than 60 million dollars.

Virginia's leading cause of wildfire is escaped debris burning. VDOF's focus on safe outdoor burning, fire prevention, and forest fire law enforcement is specifically focused to minimize the annual threats caused by careless outdoor burning.

Although wildfires occur throughout the year, Virginia's heaviest period of wildfire activity is in the spring and fall. In the spring, vegetation still dormant from the winter provides a ready fuel source. As temperatures rise, conditions become more favorable for fires to start and spread. The opposite occurs in the fall. Frost-killed vegetation and fallen leaves increase the availability of forest fuels. Combined with warmer temperatures and breezy days, Virginia again sees conditions ripe for wildfire spread, at least until temperatures finally cool down with the onset of winter.

Virginia's 4 PM Burning Law is specifically designed to limit outdoor burning in the spring. In effect from February 15 through April 30, the law prohibits burning each day, until after 4:00 p.m. Postponing outdoor burning until the late afternoon means decreasing potential for a fire to spread – temperature is lower, humidity is higher, and winds are typically calmer. Virginia's 4 PM Burning Law is credited with the prevention of numerous wildfires each year.

Finally, it is also very important to note that the VDOF's wildfire suppression success is only possible through close coordination with local fire departments, forest industry and both federal and state response agencies. The agency works closely with wildland fire suppression cooperators throughout the Commonwealth, providing training, support, and cooperation to ensure the safety of Virginia's citizens and natural resources.

Prescribed Burning

Fires play a vital role in keeping certain types of forests, grasslands, and other landscapes healthy. Most forest ecosystems evolved to tolerate semi-regular fires of lower intensity and flourish in their aftermath; however, societal norms, which often viewed all fire as bad, led a push during much of the 20th century to prevent fire at all costs. But without fires, forest health and diversity has suffered.

In an effort to reverse this trend, land managers have emphasized the increased use of prescribed fire, for the multiple benefits "good fire" brings to the forest.

In recent years, land managers have embraced prescribed fire – setting intentional, controlled fires in a specific area with a specific goal – as a necessary and useful tool to prevent dangerous wildfires and manage certain landscapes for long-term ecological health.

Benefits of Prescribed Fire

By removing dead and overgrown vegetation, prescribed fires help prevent large, intense wildfires that claim lives, destroy communities, and cost billions of dollars in damage and firefighting costs. Prescribed fires also offer other significant benefits for landscapes, humans, and wildlife:

- Removing thick underbrush in forests allows the seedlings of fire-tolerant plant communities to grow; some trees even require the heat from fire to release seeds from their cones.
- As plant communities regrow after a fire, they provide fruit, nuts, grasses, and other food that attracts a wide variety of wildlife. On lands managed for outdoor recreation, more wildlife draws more hunters, bird watchers, and hikers who spend money in nearby communities.
- Thinner, less dense forests are more accessible, which also increases these outdoor recreation activities that boost local economies.
- Prescribed fires can be used to remove specific features from a landscape that would take significant time and labor to remove by hand, such as logging debris or invasive species.

Non-Native Invasive Plant Species Control Treatments

Timing, Methods and Herbicide Rates

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This is a list of management tactics for major invasive plants, not a comprehensive control plan. For recommendations specific to your property, consult a professional forester or land resource manager. Follow all label prohibitions, precautions and safety requirements during herbicide transport, storage, mixing and application.

	INVASIVE PLANT	CONTROL TIMING	CONTROL METHOD	HERBICIDE RATES	NOTES
GRASSES	Japanese Stiltgrass	Prior to seed maturity	Manual – hand pull		Remove all roots
		Prior to seed maturity	Mechanical – mow/cut repeatedly		To reduce seed formation
		Early summer	Foliar spray	Glyphosate 0.1%	Several years needed to control seed bank
		Late spring – late summer	Foliar spray	Sethoxydim 1.5% or Glyphosate 0.5%-2%	Several years needed to control seed bank
	Wavyleaf Grass	Prior to seed maturity	Manual – pull small areas		Follow-up treatment required
		Late spring – fall	Foliar spray	Glyphosate 2%	Several years (as needed)
		April – June	Foliar spray	Sethoxydim or Clethodim 1%	Several years (as needed); inconsistent control
HERBS/FORBS	Garlic Mustard	Late spring – early summer, prior to any seedpods maturing to brown	Manual – hand pull and remove taproot		Do not leave flowering plants on ground, seeds will form; bag/ remove flowering plants
		March – June, before seedpods	Mechanical – mow or cut		To reduce seed formation
		Late fall – winter is best, but susceptible any time	Foliar spray on evergreen leaves	Glyphosate or Triclopyr 2%	Dormant season timing protects many other species
VINES	Gen. Recommendations for All Vines	All year when soil is moist	Manual – hand pull small vines		Remove as many roots as possible to prevent resprouts
		Any	Manual or mechanical – cut to “treatable” height		Follow-up with foliar herbicide applied to resprouts
		June – October, through winter for evergreen species	Foliar spray	Glyphosate 2%-3% or Triclopyr 2%-5%	Several years (as needed)
		June – February	Basal spray	Triclopyr ester 20%-25%	Follow-up usually required
		June – August	Foliar spray	Metsulfuron 2-4 oz./acre	Several years (as needed)
		June – February, late summer – fall ideal	Cut stump	Glyphosate or Triclopyr ester 20%-25%	Follow-up usually required; highly selective and uses minimal herbicide
	Japanese Honeysuckle	Before seed formation	Foliar spray	Glyphosate 2%-3% or Triclopyr 2%-5%	Treat evergreen leaves on warm days in winter

Non-Native Invasive Plant Species Control Treatments

	INVASIVE PLANT	CONTROL TIMING	CONTROL METHOD	HERBICIDE RATES	NOTES
VINES, continued	Porcelain-berry	June to October, late summer – early fall ideal	Foliar spray	Triclopyr 2%-3%	Manual ineffective due to extensive root system
	Oriental Bittersweet	All year, late summer – fall ideal	Injection or hack-n-squirt	Triclopyr amine or Glyphosate undiluted	Vines more than 1 inch in diameter
	Mile-a-Minute	May – October	Manual/mechanical – hand pull, mow or cut repeatedly		Protect skin from thorns
		May – July	Foliar spray	Glyphosate 1% or Triclopyr 1%-2%	Likely to injure other plants
	Kudzu	All year	Manually remove all root crowns		
		All year	Mechanical – mow and cover with plastic sheeting		Leave sheeting in place two years
		July – September	Mechanical – cut or mow to ground		Many, many years needed
		June – October	Foliar spray	Picloram 3%	*Restricted use pesticide
		June – October	Foliar spray	Metsulfuron 3-4 oz./acre, Triclopyr 4%, Clopyralid 1.3 pt./acre, Aminopyralid 7 oz./acre	Repeat in successive years
		June – February	Basal spray	Triclopyr ester 20%	Woody stems
		June – February	Injection or hack-n-squirt	Imazapyr, Triclopyr amine or Glyphosate undiluted	Vines more than 1 inch in diameter
SHRUBS	Gen. Recommendations for All Shrubs	When soil is moist	Manual – hand pull small plants		Roots left in ground resprout
		When fruit is not present	Mechanical – cut or mow		Follow-up treatment required
		June – February	Foliar spray	Imazapyr or Dicamba 1% or Triclopyr 2%	Several years (as needed)
		June – February	Cut stump	Imazapyr 5%-10% or Glyphosate 20%	Selective, minimal herbicide
		June – February	Basal spray	Triclopyr ester 20%	
	Multiflora Rose	See General Recommendations for all shrubs			
		June – October	Foliar spray	Glyphosate 2%-4% or Triclopyr 1%	
	Autumn Olive	See General Recommendations for All Shrubs			
	Chinese Privet	See General Recommendations for All Shrubs			
TREES	Gen. Recommendations for All Trees	June-February	Injection or hack-n-squirt	Triclopyr or Imazapyr undiluted	Small to large trees
		July – February	Basal spray	Triclopyr ester 20%-25%	Saplings
	Tree-of-Heaven	See General Recommendations for All Trees			Follow-up usually required
		Summer – fall	Foliar spray	Triclopyr 2%	Seedlings, saplings, resprouts

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