



Virginia Riparian Forest Buffer Action Plan

2024



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- York River Steward

This report is the result of a collaborative stakeholder effort coordinated by the Virginia Department of Forestry.

EXECUTIVE SUMMARY

The goal of the Virginia Riparian Buffer Action Plan is to provide a venue for stakeholders to collaboratively identify challenges in increasing buffer establishment and propose solutions to overcome these obstacles. This plan divides that goal into four objectives:

- improving site identification and outreach
- increasing capacity for implementation
- increasing riparian forest buffer maintenance, and
- improving reporting

For each objective, the action plan provides a summary of the current status, identifies challenges, and proposes solutions. These challenges and strategies were developed during stakeholder meetings and individual interviews.

This action plan intentionally does not assign tasks to individual agencies or organizations, but instead presents a collection of strategies that could be implemented to further buffer establishment. After publication, the Virginia Department of Forestry (DOF) proposes to socialize these possible strategies around the state and determine next steps with stakeholders. DOF's goal is to collectively prioritize strategies and commit to executing them within the next five years.

INTRODUCTION

While there is no silver bullet for improving water quality, riparian forest buffers are widely recognized as one of nature's most effective water filters. For this reason, increasing riparian forest buffer coverage across the Commonwealth is a priority strategy for improving water quality.

The Chesapeake Bay Watershed Implementation Plan III (WIP III) includes goals of establishing 21,965 acres of forest buffer and an additional 26,390 acres of forest buffers with exclusion fencing by 2025 (Commonwealth of Virginia, 2019). While these metrics are important, the overall goal of this action plan is to increase buffer establishment across the entirety of Virginia. To that end, this action plan explores challenges in increasing buffer establishment across the Commonwealth and includes proposed solutions that would alleviate some of these identified issues.





BACKGROUND

The Commonwealth of Virginia is one of seven jurisdictions (Virginia, West Virginia, Maryland, Delaware, Pennsylvania, New York, and Washington, D.C.) that make up the Chesapeake Bay Watershed. Of Virginia's 42,322 square miles, 23,898 drain to the Bay. This area encompasses four Major River Basins: the Potomac, Rappahannock, York, and the James (Virginia Department of Conservation and Recreation, n.d.).

The remaining 18,424 square miles are part of the Southern Rivers Watersheds which drain to the Albemarle-Pamlico Sound and the Mississippi River. The Albemarle Sound, Chowan and Roanoke rivers drain into the Albemarle-Pamlico Sound in North Carolina. The New, Holston, Clinch-Powell and Big Sandy rivers flow west and are part of the Mississippi river basin. A small area in southwest Virginia is part of the Yadkin River basin, which flows into the Carolinas, eventually reaching the Atlantic Ocean at Georgetown. The eastern half of the Eastern Shore also drains directly into the Atlantic Ocean (See Figure 1) (Virginia Department of Conservation and Recreation, n.d.).

While there is significant attention on improving water quality within the Chesapeake Bay Watershed, water quality across the Commonwealth generates

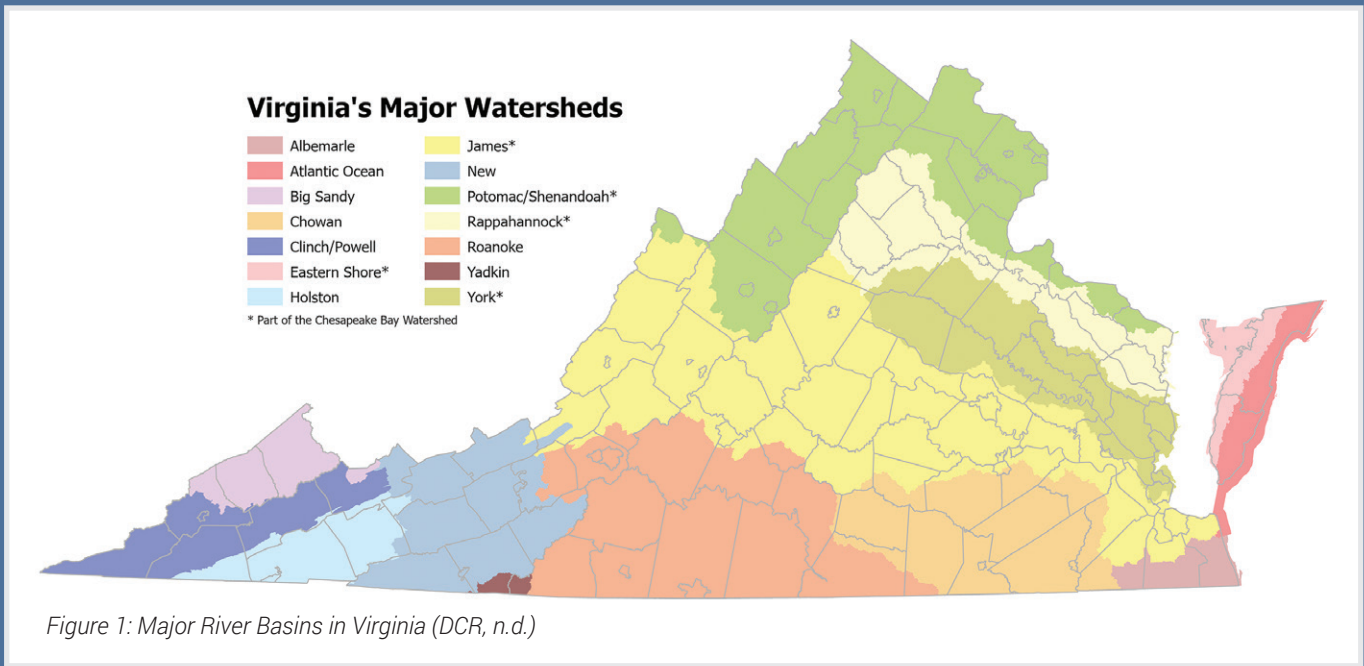
abundant health, economic, cultural and ecological benefits. Across Virginia, efforts are being made to improve water quality using best management practices (BMPs).

Recognized for their importance in improving water quality, riparian forest buffers are one of the many BMPs utilized across the state to reach water quality goals. Buffers prevent excess nutrients and sediment from entering waterways while also cooling streams, reducing flooding, and providing myriad other benefits for humans and wildlife (U.S.D.A. Forest Service, n.d.).

Land Use and Land Cover

Virginia can be divided into five physiographic provinces: the Coastal Plain, Piedmont, Blue Ridge Mountains, Valley and Ridge, and Appalachian Plateau. The geology, topography and soils differ across these provinces, impacting land use, and the top agricultural commodities (Hammer, 2023).

Areas of Virginia with fertile soils typically support several agricultural commodities like cotton, corn, wheat, soybeans, hay, apples and other produce (Hammer, 2023). The revenue and products generated are important both for farmers and Virginia's overall economy. During stakeholder sessions, the group discussed how it often makes little financial sense for a farmer to convert productive cropland to riparian forest buffer, even if they receive compensation



through cost-share and rental payments for doing so. Rather than taking fertile land out of production, the focus should remain on areas of a farm with infertile soils or very low yields, areas that are prone to flooding or erosion, and may be difficult to access with farming equipment. These areas may be smaller and narrower areas than some “traditional” programs allow, but could still provide benefits to water quality with less impact to a producer’s operation. Areas with steep slopes, infertile soils and fallow land also present greater opportunities for establishing riparian forest buffers (Stakeholder meetings, 2023).

Land that is not in agricultural production also presents opportunities for buffer establishment. In recent years, there has been increased attention on buffer establishment on non-agricultural land, including publicly owned lands, urban centers and homeowners’ association properties, among others. These nontraditional buffer sites have fewer funding opportunities and often require additional expertise to navigate site challenges like compacted urban soils, aesthetics and utility rights-of-way. Additionally, local ordinances and policies can present challenges to conservation planners when considering an installation site (Stakeholder meetings, 2023).

Chesapeake Bay Agreement

In the late 1970s, a study analyzed the loss of wildlife habitat and aquatic life within the Chesapeake Bay. The study found excess pollution to be the main cause of the degradation of the Chesapeake Bay. Recognizing a need to protect and restore the nation’s largest estuarine ecosystem, the Chesapeake Bay Program was established in 1983, creating the first Chesapeake Bay Agreement. The agreement was signed by the Governors of Maryland, Pennsylvania, and Virginia, the mayor of the District of Columbia, the U.S. Environmental Protection Agency (EPA) administrator, and the Chair of the Chesapeake Bay Commission. The agreement established a liaison office and the framework for multiple states to work together to restore the Bay (Chesapeake Bay Program, n.d.).

In 1987, the agreement established the first numeric and time-bound goal to reduce nitrogen and phosphorus in the Bay by 40% by 2000. Five years later, the Commission began to look upstream from the Bay into the contributing rivers and streams for ways to reduce excess pollution at the source within the entire basin (Chesapeake Bay Program, n.d.).

In 2000, a new agreement known as Chesapeake 2000 was developed to continue work cleaning up the Bay (Blankenship and Wheeler, 2023). The four original signatories were joined by New York,

BACKGROUND, continued

Delaware and West Virginia. With the addition of these three states, the entire Chesapeake Bay watershed was represented in the agreement. Building on the framework of the 1987 agreement, Chesapeake 2000 featured 102 goals aimed at reducing pollutants making their way to the Bay. This agreement also included land use strategies that reduce pollution and engaging the public to assist in cleanup efforts (Chesapeake Bay Program, n.d.).

In 2009, President Obama signed an executive order to continue and expand efforts to restore the Chesapeake Bay. The Chesapeake Executive Council developed two-year milestones to track progress toward meeting pollution reduction goals. These milestones were intended to accelerate restoration and increase accountability for all jurisdictions within the Bay (Chesapeake Bay Program, n.d.).

While there had been significant progress towards cleaning up the Bay, full restoration could not be realized without further reducing pollutants upstream in the contributing rivers. Furthermore, states were not meeting some of their targets for pollution reduction. To accelerate restoration, the EPA established the Chesapeake Bay Total Maximum Daily Load (TMDL) in 2010. Often referred to as a “pollution diet,” the Bay TMDL sets limits on the amount of

pollution that can enter the Bay while still allowing it to meet water quality standards by 2025 (EPA, 2024).

WIP III Goals

To meet the Bay TMDL, the seven jurisdictions developed WIPs. Each WIP set numeric goals for implementing BMPs to reduce nitrogen, phosphorus and sediment loads. The WIPs were developed using a phased approach (WIP I in 2010 and WIP II in 2012). When further pollution reduction was needed at the end of WIP II, the Bay jurisdictions adopted a third iteration of their respective WIPs in 2019 to guide work through the end of 2025 (EPA, 2023). Recognizing the effectiveness of riparian forest buffers for improving water quality, Virginia’s WIP III goals call for establishing 21,965 acres of riparian forest buffer and 26,390 acres of buffers with exclusion fencing by the end of 2025 (Commonwealth of Virginia, 2019).



Buffers in the Southern Rivers Watershed

Protecting streams and reducing pollution through the establishment of BMPs is an important strategy to protect water quality and aquatic ecosystems throughout the Commonwealth. Historically, efforts to improve water quality in Virginia have been heavily focused in the Chesapeake Bay Watershed due in large part to the Chesapeake Bay Agreement and the Bay TMDL. However, the Southern Rivers encompass roughly 40% of the state, and while this area may not drain into the Bay, these river basins provide aquatic habitat, recreational opportunities, irrigation for agriculture, and drinking water to many Virginia residents (DCR, n.d.).

The EPA has not established a TMDL for the Albemarle-Pamlico Sound or the river basins that drain into the Mississippi River, but these areas have established partnerships and developed local watershed implementation plans to improve water quality. BMPs installed with federal or state cost-share funds may be tracked by USDA or DCR but accessing data associated with federal cost-share programs can be difficult due to landowner privacy requirements. With no central clearinghouse for tracking BMPs, it is difficult to determine to what extent BMPs have been implemented to improve water quality within the Southern Rivers portions of Virginia.

Focus Areas

Virginia has made significant progress in buffer establishment across the Commonwealth over the past few decades.

This Virginia Riparian Forest Buffer Action Plan seeks to capitalize on that success by identifying what challenges remain and propose solutions to address those concerns. This action plan was created with significant input from natural resource professionals at every level, from NGO members and local government personnel to state and federal agency representatives. This stakeholder group explored four focus areas: improving outreach and site identification, increasing capacity for implementation, increasing maintenance, and improving buffer reporting.

The sections following summarize the current status of each of these focus areas, explore prominent challenges, and identify potential solutions for improvement.



OBJECTIVE 1

Improve Site Identification and Outreach

1.1 Current Status

In part due to the increased attention on the Chesapeake Bay WIP III goals, there are many opportunities for landowners to establish buffers in Virginia. Numerous federal and state agencies, NGOs, and volunteer groups offer financial and/or implementation assistance.

Challenges in Identifying Cost-Share

Depending on the type of buffer, installation costs can run between a few hundred dollars for pine to \$4,200 per acre for hardwoods with shelters (James River Buffer Program, 2024). There are a variety of cost-share programs available to mitigate these costs for landowners across Virginia. Some of the long-running assistance programs are well-known, especially within their target demographics. The Conservation Reserve Enhancement Program (CREP), for example, has been around since 2000 and has been well-advertised to agricultural producers across the Commonwealth (Dunford, 2000).

Newer grant supported cost-share programs may exist for a year or two before losing funding, and even existing programs may change funding levels or the program requirements in an effort to streamline the process. This ever-changing landscape of options creates challenges for both landowners and natural resource professionals to

stay abreast of all the current offerings (Stakeholder meetings, 2023).

Federal programs are often very competitive, and in years of diminished funding, may not be able to serve every landowner who applies. While buffer implementation is one of the most cost-effective best management practices around, it still presents upfront costs for landowners. A lack of financial assistance can lead to postponing or even canceling a project (Stakeholder meetings, 2023).

While there are other funding programs available, finding the best-fit program is no simple task. Each cost-share program has its own specific and often complex requirements. Even natural resource professionals who are well-versed in their own programs may struggle to recommend suitable alternative options from other organizations. Oftentimes, landowners seeking funding must navigate multiple agencies, learn new programs, and build new relationships; creating frustrations which can end a project before it even begins. (Stakeholder meetings, 2023).

This problem is exacerbated when there are multiple stakeholders on a property. Changes in property ownership and subsequent land use have become more common in the recent past, as have the lessor/lessee relationships that accompany absentee landownership. These landowners and producers may find themselves unable to qualify for the traditional agricultural-based incentive

programs enjoyed by a previous landowner or may simply be unaware of resources available to them (Stakeholder meetings, 2023).

It is impossible to know how many otherwise interested landowners opted out of buffer establishment because of complications in identifying cost-share.

Communicating with Landowners

Landowners in Virginia benefit from a wide variety of trusted sources of natural resources information. From state and federal agency personnel to NGO staff and university academics, Virginia is fortunate to have a wealth of dedicated professionals who care about improving the Commonwealth's natural resources.

With so many organizations working in this environment, strong communication among partner agencies, NGOs, and volunteer groups is vital to ensure conservation professionals can provide accurate and up-to-date information. Unfortunately, factors such as outreach expense, employee turnover, and inconsistency of message or timeliness in delivery continue to hamper the dissemination of riparian forest buffer information, sometimes leading to confusion and mistrust (Stakeholder meetings, 2023).

An additional issue is that several organizations rely on volunteers to develop and execute outreach campaigns with limited personnel, financial resources, and time. This can lead to information becoming outdated or obsolete if roles or personnel change or key points-of-contact leave an organization and outreach stagnates.

Beyond intentional marketing, word of mouth from happy customers is a highly effective way to encourage new participation. Satisfied recipients of a buffer project may tell their neighbors and encourage them to reach out to the program administrator. Several NGOs remarked that these kinds of referrals led to a high percentage of their buffer projects (Stakeholder meetings, 2023).

Site Availability

According to our stakeholder discussions (2023), there is a pervasive feeling that “the lowest fruit has been picked,” meaning, all the “easy” sites for installing buffers have been planted. The early adopter landowners have long since had their buffers installed. The remaining landowners are

either not interested in establishing a buffer, waiting for increased incentives, or are unaware of the existing opportunities.

Similarly, it is becoming increasingly difficult to find locations that do not already have buffers. Staff often have limited time for boots-on-the-ground exploration. They may instead rely on aerial photography to identify prospective sites, and these images can be years out of date or misleading. In one example from southeastern Virginia, aerial imagery identified a priority parcel in need of a buffer. Upon further investigation, the area in question turned out to be the roof of a house (Stakeholder meetings, 2023).

These and other limiting factors have traditionally led to natural resources professionals relying on agricultural producers to meet buffer implementation goals. These are individuals and properties that they already know. It is more efficient to add buffer practices to an existing plan with these known individuals rather than identifying, meeting, and convincing a yet unknown landowner to participate (Stakeholder meetings, 2023).

Compounding these issues are the issues of land parcelization and development, which pares the potential existing eligible acreage into smaller sections—often with competing landowner objectives and goals (Stakeholder meetings, 2023).

Subsequent urbanization of these parcels then precludes many of those landowners from being able to access traditional incentive programs, leading to a disconnect between land managers and landowners. Several programs and technologies are in development to bridge that knowledge gap. Projects such as the Virginia Foundation for Independent Colleges' Collaborative Heat Watch Research Project and the U.S.D.A. Forest Service and DOF Urban Heat Mapping Project produce maps that communities can use to help plan strategic plantings aimed at lowering ambient temperatures in urban environments (Virginia Foundation for Independent Colleges, n.d.). When installed along natural or man-made channels, these plantings have the added benefit of improving the water quality of the streams the channels empty into. Additionally, municipalities and counties that include “green infrastructure” ideas into their comprehensive plans can identify areas lacking sufficient tree cover and bring attention to imperiled stream channels (Stakeholder meetings, 2023).

1.2 Challenges with Improving Site Identification and Outreach

- Need to Reach New Audiences
 - Existing outreach efforts primarily target agricultural producers
 - Unmet need to reach other possible landowners including:
 - ◆ New landowners
 - ◆ Non-agricultural farm owners and forest landowners
 - ◆ Urban landowners
 - ◆ Producers that rent (and do not own) the farmland on which they operate
 - ◆ Absentee landowners
 - ◆ Publicly owned land
- Project Site Availability
 - Site availability differs by physiographic region. Each region has specific challenges
 - Every year as more buffers are established, there is a decreasing number of possible bufferable acres
 - Urbanization and land development further reduces the amount of possible land that can be buffered
- Need for Ready-to-Go Consistent Statewide Outreach Materials
 - Lack of a centralized source of information that includes all available cost-share programs
 - Agencies and NGOs know their own programs best but may not be well-versed in other organizations' offerings
 - Inefficient use of time for every organization to create its own outreach materials for the same core message "establish more buffers"
- Numerous Competing Cost-Share Options Make It Difficult to Identify Best-Fit Program
 - There are many different cost-share programs available from the NGO, state, and federal level

- Each cost-share program has its unique requirements, benefits, application process, and point of contact
- Frequently changing programs and staff turnover create a constant need for training on available programs
- Too many options may deter some landowners from participating in any program

1.3 Identified Solutions to Improve Site Identification and Outreach

- Create buffer ambassador programs to publicize buffer benefits and opportunities
- Promote and expand existing regional buffer summits to cover more of the Commonwealth's watersheds
- Increase multi-agency cross-over training (WIP14) to increase program familiarity and the sharing of unified outreach message
- Create a statewide buffer outreach campaign (e.g., "Virginia is for Buffers")
- Create a centralized clearinghouse for buffer materials that includes:
 - Customizable campaign materials (print, digital, video, etc.) for statewide use
 - Best practices resources for landowners and resource professionals
 - Success stories
 - Network of partners and contact information
 - Up to date cost-share information and decision tree tools
 - Training for resource professionals
 - Calendar of events
- Invest in GIS-based tools using current 1-m resolution land use/land cover (LULC) imagery to identify potential project sites across Virginia
- Create template green infrastructure plans that are broad enough to be incorporated into the comprehensive plans of municipalities and counties



OBJECTIVE 2

Increase Capacity For Implementation

2.1. Current Status

At the time of this Plan's publication, there are myriad organizations working in Virginia on buffer establishment, from small NGOs to enormous federal agencies. These groups are highly collaborative in nature and there are countless examples of partnerships resulting in better projects for landowners. This work is supported by record levels of cost-share dollars and federal funding from the Inflation Reduction Act and Bipartisan Infrastructure Law. It is important to recognize that this collaborative, well-funded environment is leading to higher implementation. According to data in DEQ's Best Management Practices Warehouse (BMP Warehouse), 2023 was the best year for buffer implementation since 2012 (BMP Warehouse, 2024), with 1,144 acres recorded within the Chesapeake Bay Watershed. Despite this success, significantly more work is needed to reach Virginia's ambitious WIP III buffer goal. This section explores the challenges and potential solutions that could increase buffer implementation in Virginia.

Additional Challenges

Along with the issues of cost-share complexity discussed in Objective 1, there are additional challenges around funding. Despite current record levels of cost-share, payments for individual landowners are still sometimes insufficient to encourage implementation. For example, in southeast Virginia, some row-crop farmers find

that the available cost-share is too low to replace the income they would lose by converting that land to trees (Farm Service Agency, 2015). There is also reluctance to participate in programs that operate on a reimbursement basis and require an up-front payment by the landowners. As buffer implementation is a purely voluntary practice, the financial incentives need to be sufficient for agricultural producers to agree to participate (Stakeholder meetings, 2023).

Incentives

Historically, the majority of buffer cost-share programs were only available to agricultural producers. In recent years, new cost-share programs have emerged to serve additional audiences. Programs like the Virginia Conservation Assistance Program (VCAP) and Virginia Trees for Clean Water (VTCW) offer financial assistance to private landowners in urban areas and public property owners respectively.

As another example, the James River Buffer Program (JRBP) pioneered a flexible no-cost buffer program in the Upper and Middle James Watersheds. This program began in 2019 as a collaboration of the James River Association and DOF, and later the Chesapeake Bay Foundation in 2021. Primary funding was from the Virginia Environmental Endowment's James River Water Quality Improvement Program. JRBP installs buffers and provides three years of subsequent

maintenance at no cost to the landowner. Anyone with at least 35 feet of bufferable land by a body of water within the watershed qualified for the program, regardless of their land use. The JRBP has been extremely successful, which its leadership contributes to the simple design, the full funding, the dedicated staff, and the connection to the Upper and Middle James Riparian Consortium, which catalyzes regional collaboration (James River Association, 2024).

DOF will build on this model with its new initiative, the Riparian Forest for Landowners (RFFL). RFFL will replicate the JRBP's flexible funding model at a statewide level, thanks to funding from the Inflation Reduction Act and the Virginia Water Quality Improvement Fund. There are many other examples of new funding mechanisms that aim to reach previously underserved landowners or to provide more substantial financial incentives to implementation.

Even when project funding is available, in some parts of the state it can be difficult to find qualified contractors to plant and maintain buffers. This is especially true with small-acreage projects, which may not be cost-effective for businesses. Some organizations have begun aggregating projects across larger areas to make contracts more enticing to businesses who may otherwise be unwilling to complete small individual jobs (Stakeholder meetings, 2023).

Workforce Development and Training Initiatives

There are several exciting workforce development and training initiatives designed to further increase the number of contractors available to conduct buffer work. For example, the Appalachian Conservation Corps (ACC) hires young adults and trains them in buffer planting, maintenance, and herbicide application. These crews are available for hire across the state, focusing on serving areas where no other contractors are available. ACC fills an immediate workforce gap, and its training encourages its staff to explore long-term employment in natural resources (ACC, personal communication, 2024).

The Chesapeake Bay Landscape Professionals (CBLP) program presents another path to increasing buffer competence across Virginia. In addition to its other courses, CBLP offers a three-day Buffer

Certificate training. Through this hybrid course, students learn to install a buffer, from preparing the site and designing a planting to selecting trees and writing a maintenance plan. As of March 2024, 72 individuals have received the Buffer Certificate in Virginia (CBLP, personal communication, 2024).

Installing buffers in urban areas requires additional skills and training. These projects present unique challenges, including small parcel size, multiple (and occasionally competing) stakeholder needs, limited funding opportunities, and complex site conditions featuring multiple uses, utility lines, public access needs, etc. While buffer implementation has historically been focused on rural areas, these urban centers are receiving additional attention from state and local organizations (Stakeholder meetings, 2023).

Finally, installing a successful buffer requires a sufficient supply of appropriate trees. In Virginia, trees can be sourced from both private and state-run nurseries. Other states also manage their own nurseries, including nearby North Carolina.

DOF operates two state-run nurseries in Virginia. At the Sussex Nursery in Courtland, DOF grows its Loblolly Pine and Longleaf Pine crop. The Augusta Nursery in Crimora grows over 40 species of native hardwood bare-root seedlings and shrubs which are available for purchase from October-April. Trees are shipped or can be picked up from the Augusta Nursery from mid-February to the end of April. DOF sells over 30,000,000 seedlings every year, but demand remains high, especially for hardwood and shrub varieties. It is not uncommon for the Augusta Nursery to sell out of certain species (DOF, personal communication, 2023).

The Augusta Nursery faces challenges sourcing seed to grow hardwood seedlings. The nursery administers a seed collection campaign in Virginia every fall and accepts donated acorns from the public (DOF, n.d.). For many of the other hardwoods the seed must be purchased and grown. If seed is unavailable or limited in supply, it impacts the number and variety of species the nursery can sell each year.

The DOF nurseries are self-supporting and rely solely on revenue generated from seedling sales to operate. Due to growing demand for hardwood species, in 2022 the General Assembly allocated funding to expand DOF's seedling production

(Virginia Department of Planning and Budget, 2021). This funding will allow DOF to grow more hardwood seedlings, purchase additional equipment and hire additional staff. In addition to the state's efforts, NGOs like the Potomac Conservancy and Friends of the Rappahannock are working to increase collection of native seeds for seedling production through campaigns like "Today's Seeds, Tomorrow's Trees."

While buffers have traditionally been planted using hardwood trees, some practitioners have begun to explore planting buffers in pines to mimic succession and support natural regeneration. In urban areas, landowners often prefer larger caliper trees, which are more expensive and harder to transport, resulting in increased overall project costs (Stakeholder meetings, 2023).

2.2 Challenges with Increasing Capacity for Implementation

■ Technical Assistance

- Limited technical assistance available for site visits, planning, and final inspections of riparian forest buffer implementation
- High turnover of entry-level positions necessitates continuous training of new hires on buffer programs, marketing, and establishment
- Short grant windows make it difficult to design, market, and execute new programs quickly enough to see success
- Competing agency and organizational priorities divert resources from buffer establishment
- Small acreage projects require just as much time from technical service providers with smaller acreage returns
- Small projects may cost more per acre than larger projects due to economies of scale

■ Riparian Forest Buffer Project Funding

- Financial incentives are not always sufficient to replace income lost from converting cropland into trees
- Buffer establishment is a voluntary process. Early adopters have already

planted their buffers. The remaining landowners require additional incentives that have not yet been met

- Up-front out-of-pocket costs are a deterrent to landowner sign-up
- Some grant opportunities carry an extensive administrative burden that may be too great for smaller organizations to manage
- Fluctuating funding and demand create inefficiencies in program planning and staffing
- Cost-share and incentive payments can have tax implications for landowners which may deter participation

■ Urban Landscapes

- Sites may not allow for minimum Bay buffer width requirements of 35 feet
- Lack of landowner interest because of preference for water view, lack of understanding about what a buffer is, etc.
- Urban projects can be time-consuming and complicated due to the many stakeholders with differing priorities
- Urban project sites are often very small creating challenges in securing funding and finding technical assistance
- Traditional buffer plantings can be considered aesthetically unappealing during the establishment phase (preference for larger stock)
- Local codes and ordinances requirements (e.g., species, sizing, spacing, etc.) can increase cost of plantings

■ Nursery Stock Availability

- Limited seedling stock availability in the fall
- Program specifications for seedling stock size may limit the use of certain species
- Need to expand the species selection for plantings to better align species with geographic growing zones for better survival rates in riparian soils/sites

2.3 Identified Solutions to Increase Capacity for Implementation

- Support flexible buffer cost-share programs like DOF's RFFL, JRBP and the Rappahannock Coastal Forest Program
- Increase financial incentives for existing cost-share programs
- Promote stacking cost-share programs to increase overall financial incentive to landowners
 - Simplify sign-up process for buffer cost-share programs
 - Increase flexibility in existing buffer programs (e.g., Allow multi-purpose buffers, agroforestry, larger planting stock at lower densities, etc.)
 - Support the expansion of existing and creation of new workforce development and intern programs
- Increase enrollment in existing buffer workforce training opportunities like the Chesapeake Buffer Landscape Professionals certification (CBLP). Market these opportunities to non-traditional buffer resources professionals (e.g., turf and landscaping companies, etc.)
- Create a statewide volunteer corps program to train, supervise, and assist volunteers to conduct buffer outreach, planting, and maintenance
- Expand seed collection efforts and training to increase seed availability for nurseries
- Create a best practices manual for buffer establishment
- Hold cross-training events to familiarize natural resource professionals with all available programs





OBJECTIVE 3

Increase Riparian Forest Buffer Maintenance

3.1 Current Status

After a buffer project is in the ground, it needs periodic maintenance to function as designed. During stakeholder meetings held in 2023, watershed professionals discussed that although there is an abundance of funding to establish new buffers, especially on agricultural properties, funding to maintain existing buffers is scarce. There is also confusion about what maintenance is necessary or allowable. At one time, landowners were told that mowing or spraying around a buffer could invalidate their cost-share contracts, leading many to take an entirely “hands-off” approach that led to overgrown and invasive plant-filled sites.

Current cost-share programs often require the landowner to perform maintenance at specific intervals to remain in compliance. This requirement is unpopular with producers due to the cost and time commitment which leads to lower buffer adoption rates (Stakeholder meetings, 2023).

Landowners who are willing to tackle necessary maintenance have been frustrated that incentive and rental payments are not keeping pace with the rising costs of maintenance, namely herbicides. Larger buffers often require that the maintenance be contracted out to firms with the requisite pesticide certifications and equipment. This can quickly increase costs to an unsustainable level for landowners, leading them to forego maintenance

and chance being found out of compliance (DCR, 2024). In areas where there is a shortage of contractors to perform the work, this decision is increasingly more common (Stakeholder meetings, 2023).

Natural resource organizations are exploring how to best offset rising maintenance costs. For example, the James River Buffer Program and Riparian Forests for Landowners both offer follow-up maintenance on their projects at no cost to the landowner. The James River Stewardship Program provides another model, utilizing summer interns to assess and plan for maintenance on older buffers, regardless of how the buffer was established. Other groups are activating volunteers to conduct monitoring and maintenance, along with exploring ways to stack cost-share programs to meet both establishment and maintenance needs. There are fewer funding opportunities outside of the Chesapeake Bay Watershed, which leads to additional challenges for those regions of the state (Stakeholder meetings, 2023).

3.2 Challenges with Increasing Maintenance

- Landowner Concerns
 - Confusion about landowner maintenance responsibilities and restrictions (e.g.,

misconception that mowing within a buffer would invalidate a contract)

- Technical Assistance for Riparian Forest Buffer project maintenance
 - Shortage of available trained and licensed pesticide contractors
 - Certification requirements to apply regulated herbicides and pesticides restrict the number of possible applicators
 - Complexity of contracting for maintenance because needs vary by site
 - Lack of funding for monitoring and maintenance

3.3 Identified Solutions to Increase Riparian Forest Buffer Maintenance

- Create clear and consistent messaging on best practices for buffer maintenance. House these recommendations on a central statewide clearinghouse
- Develop a flexible statewide riparian forest buffer maintenance program
- Build ongoing maintenance funding into buffer establishment cost-share programs
- Create statewide training opportunities on buffer maintenance best practices
- Create streamlined opportunities for pesticide/herbicide applicator certifications
- Support equipment sharing between agencies and NGOs to lower rental costs
- Create paid and/or volunteer buffer stewardship teams





OBJECTIVE 4

Improve Reporting

4.1 Current Status

With the ambitious Chesapeake Bay WIP III goals comes a need to accurately measure Virginia's progress towards those goals.

Like other practices that count towards the Chesapeake Bay goals, buffers must be reported annually to the Best Management Practice Warehouse (BMP Warehouse), an online database administered by DEQ. Agencies and organizations report riparian forest buffer acres established in the previous year to the BMP Warehouse by the end of October. From 2000 to 2023, 27,687 acres have been reported to the DEQ BMP warehouse (Figure 2) (BMP Warehouse, 2024).

Only agencies and organizations that register with the BMP Warehouse may submit their acres. As of January 2024, just seven organizations have ever submitted buffer acres to the BMP Warehouse. Since there are more than seven organizations planting buffers within Virginia's portion of the Bay Watershed, Virginia is likely underreporting its accomplishments.

In addition to underreporting, there is also concern over accidental duplicate reporting. The groups who report to the BMP Warehouse recently coordinated their efforts to avoid "double-counting" buffers. Now, those organizations will only report the projects that they funded. For example, DCR would report buffers planted through the VACS, FR-1, and FR-3

programs while the USDA reports those planted through the federally funded CRP (DOF, personal communication, 2024).

The one exception is DOF. The agency reports only those buffer projects which field staff enter into an agency database (IFRIS), and those that did not receive funding from any of the other organizations that report to the BMP Warehouse.

For example, DOF would report buffers planted by a landowner without any outside funding, buffers planted by volunteer groups, and buffers funded by NGOs that are not registered with the BMP Warehouse. DOF would not report a project funded by CREP or any other cost-share program, even if DOF field staff provide technical assistance (DOF, personal communication, 2024).

To capture buffers that do not receive any cost-share, Virginia Cooperative Extension launched the Virginia Farm Voluntary Ag BMP Inventory. This survey is designed to capture work conducted by landowners without any external cost-share or technical assistance. Because these landowners are not working with outside partners, their efforts would previously not have been reported to the BMP Warehouse. When this survey was first conducted in 2021 it captured 713 buffer acres believed to be previously unreported (BMP Warehouse, 2024).

Despite these efforts, it is likely that Virginia is still not reporting all buffers installed on the landscape.

There are other NGOs and landowners who are planting buffers without DOF's assistance that do not know how to report their work. DOF and partners are working to spread this message (DOF, personal communication, 2024).

Once buffer acres are reported to DEQ's BMP Warehouse, they are processed through the National Environmental Information Exchange Network (NEIEN) before ultimately arriving at the EPA's Chesapeake Assessment Scenario Tool (CAST). CAST is a modeling tool used

to project the level of nitrogen, phosphorus, and sediment reduced as a result of BMPs that are put into place. It is also used as a tool to track progress toward WIP III goals. Once in CAST, these acres are credited toward Virginia's total load reduction goals (DOF, personal communication, 2024).

Most BMPs in CAST have a lifespan, after which they need to be verified and re-reported or they "expire" and lose credit in the model. For buffers, an individual must visit the buffer, record its acreage and geography, and submit that data back to the BMP Warehouse during the annual reporting window before the buffer reaches its 15-year expiration date. With tens of thousands of acres on the landscape, this level of individual attention is simply not feasible. To date, no acres have been verified and re-reported to the BMP Warehouse (BMP Warehouse, 2024).

Practice expiration is one of the primary reasons Virginia has not met its WIP III goal for riparian forest buffers. While Virginia reported 27,687 buffer acres between 2000 and 2023 to the BMP Warehouse (Figure 2), according to our calculations, we estimate that 22,043.28 of those acres have since lost credit in CAST (CAST, 2024).

This verification system is in place to avoid awarding credit for practices that are no longer on the landscape. Further research is needed to estimate what percentage of buffers fail or are removed after 15 years. Trees live a long time, so it does not seem reasonable to discount their contribution to pollution reduction after only 15 years.

Total Acres Reported to BMP Warehouse and Total Acre Progress Shown in CAST 2000 - 2023

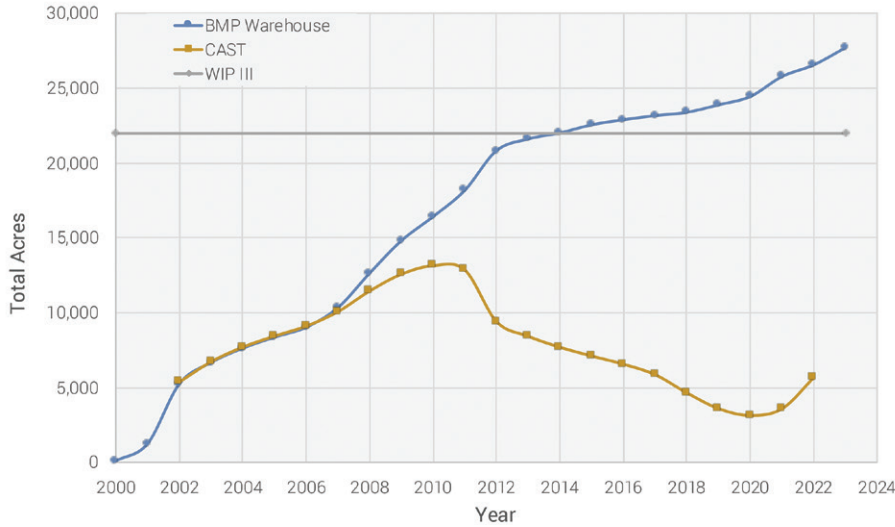


Figure 2. Total acres reported to BMP Warehouse and total acre progress shown in CAST from 2000-2023. In 2023, CAST showed 6307.7 acres compared to 27,687.32 acres reported in BMP Warehouse.

Riparian Forest Buffer Acres Recorded in Virginia by DOF 2008 - 2023

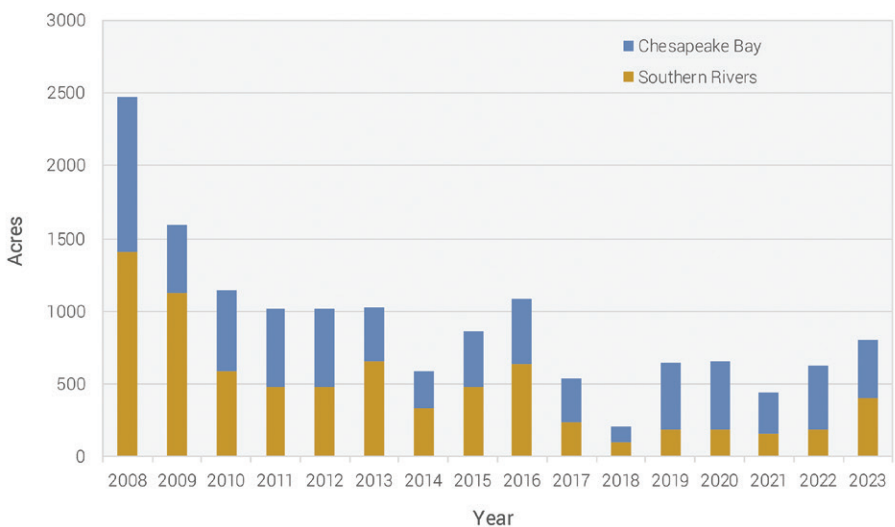


Figure 3. Total Riparian Forest Buffer Acres Recorded by DOF in Virginia. This data is reported by field staff to DOF's internal database, IFRIS. DOF only reports buffers to the BMP Warehouse that are within the Chesapeake Bay Watershed and are not reported by another agency (BMP Warehouse, 2024; DOF, 2024).

Outside of the Chesapeake Bay Watershed, there is no central repository of buffer data. Creating a shared database may become necessary if Virginia begins other landscape-scale restoration efforts (ex. Albemarle-Pamlico Sound, Southern Rivers, etc.). DOF, however, does track buffer acreage across the state in its internal database. From 2008-2023, DOF recorded 7,559 acres of buffer within the Southern Rivers watersheds and 7,097 acres in the Bay Watershed (DOF, 2024) (Figure 2).

4.2 Challenges with Improving Reporting

- Reporting
 - The process for reporting riparian forest buffer projects lacks coordination and clarity
 - Widespread lack of awareness that all buffers must be reported to the BMP Warehouse to receive credit towards Virginia's WIP III goals
 - Not all planted buffers within the Chesapeake Bay Watershed are being reported to DEQ's BMP Warehouse
 - There is no central reporting system for buffers in the Southern Rivers Watershed
 - Need for greater consistency and coordination in reporting across agencies and NGOs
 - Misconception that buffers reported to Field Docs and other grantors receive credit towards WIP III goals
 - Lack of transparency of how CAST credits and expires buffer acres
 - Inconsistencies between the buffers that have been reported to DEQ's BMP Warehouse and the acreage credited in CAST
 - CAST is a tool for modeling the amount of water quality improvement that results from implementing BMPs in the Bay Watershed. It is ineffective at tracking progress towards BMP goals
- Verification
 - CAST expires buffer acres in Virginia after 15 years unless they are verified and re-reported

- Virginia does not consistently verify and re-report acres to CAST, because it's not clear which projects need to be inspected, and agencies/organizations do not have the resources to manually inspect these projects

4.3 Identified Solutions to Improve Reporting

- Require reporting acreage to the DEQ BMP Warehouse in all buffer funding grant agreements
- Continue to support Virginia Cooperative Extension's survey of voluntary BMPs which captures previously unreported buffers installed by landowners
- Intensify WIP 14 Interagency Task Force training of BMP recording and reporting procedures
- Expand training on reporting riparian forest buffer projects to the DEQ BMP Warehouse to include local governments and non-profit organizations (NGOs)
- Develop a plan to address buffer verification, such as collaborating with the EPA Bay Program to replace individual in-person buffer inspection requirements with landscape scale verification procedures using LiDAR (Light Detection and Ranging)
- Develop a how-to guide with best practices for reporting and verifying buffers, and post this on the central clearinghouse
- Increase transparency of goal setting and better communicate progress towards these goals
- Collaborate with EPA to modify CAST or to create new tool better suited for tracking BMP implementation
- Extend the lifespan of buffers in CAST
- Encourage smaller organizations to share their buffer planting data with DOF, which can report them to the DEQ BMP Warehouse on their behalf
- Hold annual events to communicate progress made towards WIP III goals and answer questions on the goal setting and reporting processes



CONCLUSION

Virginia has already made great strides in establishing buffers across the Commonwealth. This plan details specific, realistic steps that could be pursued to further buffer implementation.

This document intentionally does not assign tasks to specific organizations, but rather presents realistic opportunities that could be collaboratively or individually realized. The next steps to expand buffer establishment are to collectively review and prioritize these proposed solutions and to leverage existing resources to execute these strategies. To further these efforts, DOF offers to bring this plan around the state and discuss tenable next steps with stakeholders. Ideally, we will collectively identify a handful of priority strategies and commit to executing them within the next five years. By continuing to build upon Virginia's buffer establishment momentum, we are planting a future of cleaner water for all.

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