Maryland's Riparian Forest Buffer Strategy

July, 2022

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Executive Summary

Riparian forest buffers provide core benefits for Maryland's citizens and environment, including clean water, wildlife habitat, and cool stream temperatures. Given their importance, lofty goals have been set to increase riparian forest buffer coverage in the Chesapeake Bay Watershed. The 2010 Chesapeake Bay Agreement set a goal of 900 new miles of planted riparian forest buffer every year until 70% of the watershed's riparian areas have tree canopy coverage, with a deadline of 2025. Based on analysis using 2013 land cover data, Maryland has around 57% tree coverage in its riparian area. In order to achieve 70% buffer coverage by 2025, the rate of planting new riparian forest buffers and protecting existing ones will need to increase. Maryland has a strong framework in place to support this effort and new opportunities to expand capacity.

Maryland has multiple existing programs that can be used to fund new riparian forest buffers, including the federal Conservation Enhancement Reserve Program (CREP) and grant-funded initiatives such as Healthy Forests/Healthy Waters. There are also new and underutilized funding opportunities for forest buffer planting that can accelerate progress. This includes funding from the 2021 Tree Solutions Now Act and federal funding sources. Seedling stocks will need to increase and the workforce will need to expand to accomplish more plantings. Consistent and effective maintenance in new plantings is integral for their survival, and contractual and volunteer workforces should be developed to support this.

In order to reach the goal of 70% of riparian areas being buffered, existing buffers must be protected. Maryland has several funding sources available to purchase land and conservation easements to protect natural areas, like riparian forest buffers, from tree canopy loss. Maryland also has robust conservation laws in place at the State and local level which help protect riparian forest buffers.

One of Maryland's guiding principles for buffer implementation is to get buffers in the ground where they are needed the most and will do the most good. Some of the areas Maryland plans to target for buffer restoration and conservation include wildlife habitat, including for brook trout, freshwater mussels, and early successional birds; areas that drain into drinking water sources; MS4 communities that need riparian forest buffers to meet their stormwater requirements; protected lands, like parks and private easements; and urban areas. Outreach, including mailers and participation at local festivals and events, should be in these priority areas. Other important outreach methods include making online resources easily navigable, so anyone who wants to plant a tree can find information on programs and how to get started.

Coordination among partners and leadership is one of the most important elements for getting more buffers on the ground. Maryland has the Stream ReLeaf Committee made up of private and public partners which meets several times a year to discuss all things riparian forest buffer related and contribute to Maryland's buffer strategy. There is also great coordination among Maryland's state agencies; the Maryland Department of Natural Resources, Maryland Department of the Environment, and the Maryland Department of Agriculture all contribute to increasing riparian forest buffer coverage in Maryland. Maryland also participates in multi-State groups, like the Chesapeake Bay Program's Forestry Workgroup and the Upper Potomac Buffer

Strategy. There are also opportunities for multi-state collaboration on larger funding opportunities, like United States Forest Service's Landscape Scale Restoration grants.

In order to achieve buffer goals, foundational elements need to be developed, then efforts can focus on targeted investments. Foundational elements are the parts of the buffer strategy that are necessary for fully functional effort. This starts with investing in the people who do the work, like expanding the planting and maintenance base, working with volunteer groups for maintenance and seed collecting, and partnerships. As foundational elements are built to capacity, targeted investments can be made in outreach to landowners and supporting and developing programs with funding that target specific needs, like wildlife habitat.

The below table outlines the two year priorities for Maryland's buffer program:

Topic	Lead	Steps to Achieve Goal	Deliverables
Landowner Outreach	DNR	Expand information through DNR Communications/ webpage; Coordinate inclusion of buffers in 5MT marketing	Accessible website with information on planting programs
Expanded Funding and Financing	MDE	Report progress by programs to identify use of different tree planting opportunities and program gaps in coordination with DNR, MDA, CBT, and others. Identify opportunities in the Conservation Financing Act and pay-for-performance approaches to increase rate of buffer adoption, Coordinate funding opportunity information among partners	Matrix of funding options and tree planting opportunities, feeding communications efforts, FFIT tool updates, buffer restoration tracking as part of 5 Million Trees tracking and reporting
Maintenance	DNR	Coordinate priority for buffer plantings in contracted maintenance assistance through 5MT. Utilize regional staff to group maintenance. Explore options for maintenance through carbon markets	Expanded options for buffer maintenance, training available to contractors interested in delivering affordable buffer maintenance services
Planting Stock	DNR	Regular meetings with MD Nursery, Landscape and Greenhouse Association, Develop information of desired species and sizes of larger tree planting stock, Pursue potential for advance purchase contracts to stimulate production; Develop more native tree seed collection mechanisms for seedling nursery	Expanded production and species selection

Technical Assistance	DNR	Identify and communicate staffing priorities among partners. Pursue rapid hiring and filling of vacancies, develop robust training with a combination of field and online training and mentorship, continue contractor training	Increased technical assistance staff in affected agencies and organizations, established training program, contractor training offered 2+X/yr.
Targeted Buffer Planting	DNR, MDE	Identify target watersheds and communities for tree planting priorities. Develop targeted outreach. Develop partnerships with relevant groups (i.e. Trout Unlimited for plantings in trout watersheds)	Funding options for buffers in the different priority areas outlined in strategy
Forest Buffer Conservation	DNR	Evaluate forest loss patterns in buffers, summarize progress from existing programs, and develop conservation needs/strategy.	Report summarizing patterns of forest loss and protection in riparian area, recommendations for future needs
Keeping and Improving CREP	CREP Advisory Committee, led by MDA	Partner input into 2023 Farm Bill. Expand reporting of CREP benefits for wildlife and climate resilience	Progress and opportunities for improvement in Annual CREP Report
Stream ReLeaf Coordination and Buffer Tracking	DNR	2 + meetings a year, annual reporting with MDA to MDE for Chesapeake Bay and Climate reporting	Current buffer strategy and reporting

Metrics to Track

- **Buffer planting acres and miles** by year, county, and watershed
- **Current forest and tree canopy in 100-foot stream and shoreline buffers**- high-res data- acres and percent by state, county, watershed every 3 years, subject to data availability
- **Trends of loss and gain in forest and tree canopy**- acres by state, county, watershed
- **Number of species and inventory of tree seedlings** at the State Nursery (private growers as available)
- **Annual summary of additional training** or mentorship needs
- **Annual summary of funding gaps** for restoration and maintenance

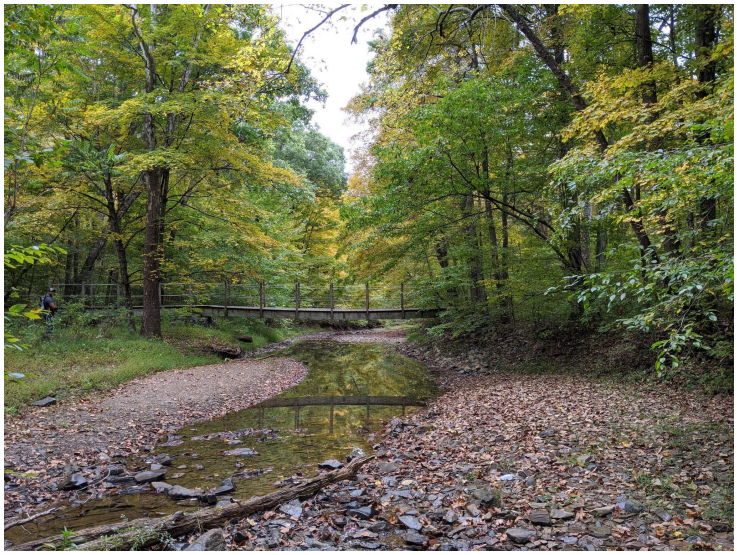
Introduction

Forest Buffer Benefits

Riparian forest buffers provide core human and environmental benefits, from basic water quality protection to wildlife habitat, streambank stability, aquatic habitat, water temperature moderation, recreation, biodiversity, and aesthetics. In the Chesapeake Bay region, the natural riparian vegetation in many areas is forest. Forest buffers not only attenuate pollution before it reaches streams, they support a diversity of habitat elements and food base that helps streams maximize capacity to capture nutrients even after they enter the water. Forest buffers take a few years to mature and reach full function, but can significantly reduce nutrients even after only 3-5 years and are a fundamental element to building and sustaining basic stream functions in watersheds over the long term. Streams reflect characteristics of the entire watershed, but are most sensitive to conditions nearest to the water. Forest buffers have been found to be closely linked to stream health as measured by an index of biotic integrity based on bottom-dwelling stream organisms, with good stream health only found where forest buffers exceed 60% and impervious surfaces in the watershed were less than 10%. Forests have high infiltration capacities to absorb runoff, lower nutrient releases, and once established have a great ability to sustain themselves with few inputs.

The definition of riparian forest buffer used for Maryland's Buffer Strategy is based on the one adopted in 1996 by the Chesapeake Bay Executive Council. "Riparian areas are those lands adjacent to streams, rivers, and other bodies of water and serve as a transition between aquatic and upland environments. A forested riparian buffer helps to:

- Maintain integrity of stream channels and shorelines;
- Reduce the impact of pollution by trapping, filtering, and converting sediments, nutrients, and other chemicals;
- Supply food, cover, and thermal protection to fish and other wildlife."

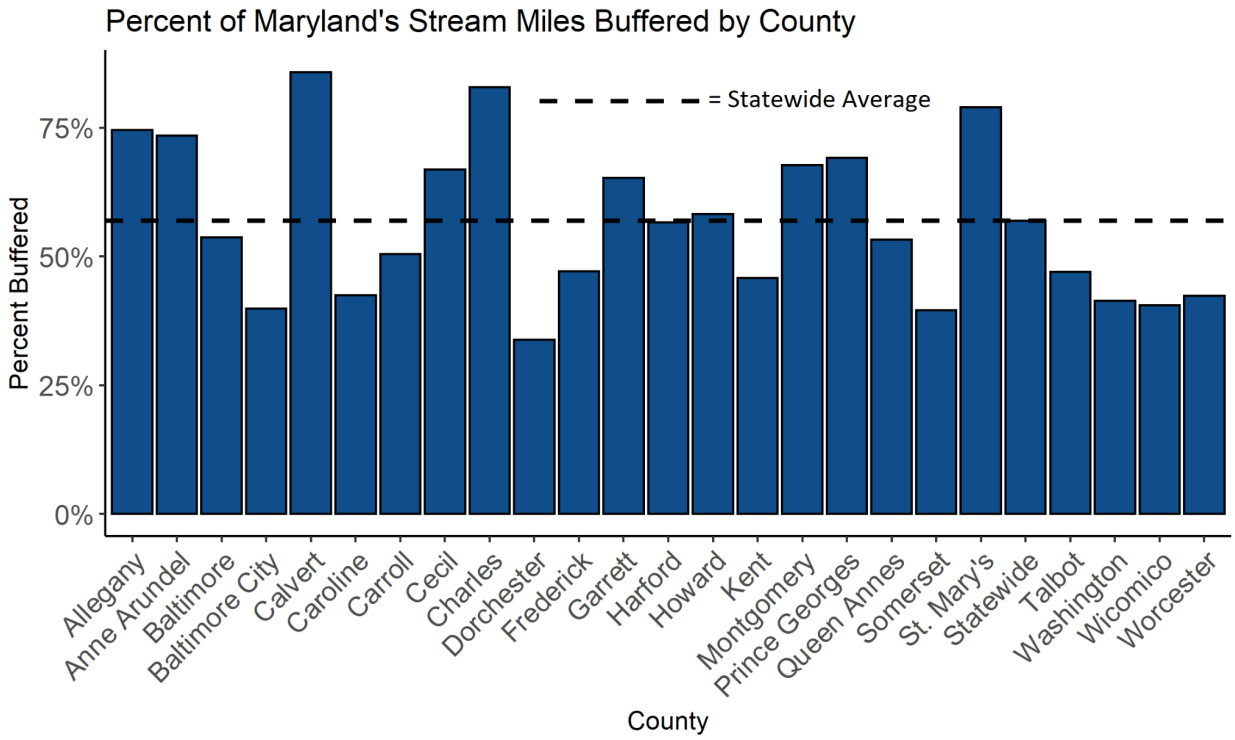


Maryland's Buffer Goals and Progress

Chesapeake Bay Program

The 2010 Chesapeake Bay Agreement set a goal of planting 900 miles of new riparian forest buffer every year in the Chesapeake Bay Watershed until 70% of all riparian areas throughout the watershed are forested, with a deadline of 2025. The Agreement does not set out specific

goals for each state. Based on a DNR analysis using the Chesapeake Conservancy's 2013 high resolution land cover data, approximately 57% of Maryland's riparian areas are fully buffered (Figure 1). That translates to about 10,462 miles of single-sided buffers. Approximately 2,406 miles of additional buffers will need to be planted to get Maryland from 57% to 70% buffered. For this analysis, fully buffered was defined as a stream segment that had at least 80% tree canopy coverage within 100 feet of the stream. This analysis is being updated with the new 2018 high resolution land cover data released in May 2022.



Maryland's Watershed Implementation Plan

Maryland Watershed Implementation Plans (WIPs) document the steps, measures, and practices Maryland and its local jurisdictions will take to achieve and maintain the final Chesapeake Bay TMDL by the year 2025. Maryland is currently operating under its Phase III WIP, which sets goals from 2018-2025.

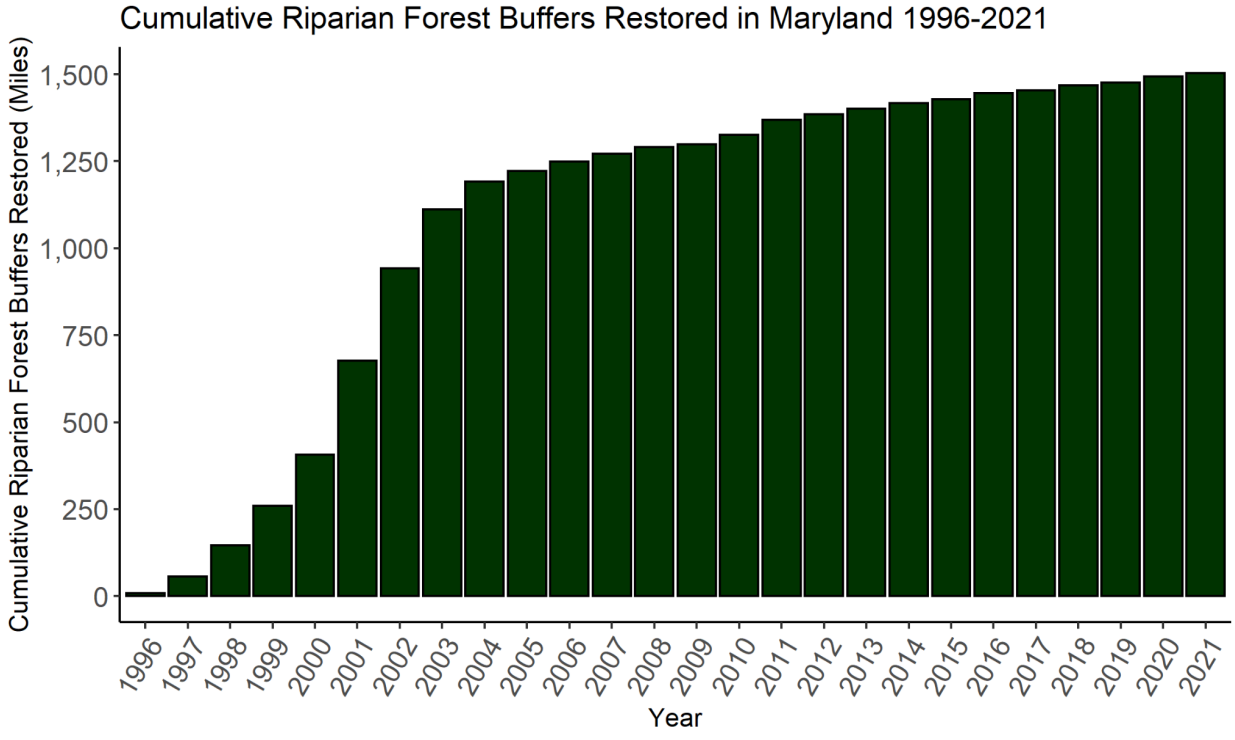
Maryland's Phase III WIP breaks down forest buffer goals into three categories- natural filters on public lands, agricultural buffers by county and urban buffers by county. The natural filters on public lands is a state-wide goal for nature-based practices on public land, including planted forested buffers and restored wetlands. The urban buffer goal is set by individual counties as part of their mix of practices to meet their WIP target and compiled for the statewide goal. The rural buffer goals were established through a public process led by the Maryland Department of Agriculture (MDA); regional public meetings considered stakeholder input on a wide range of agricultural practices. Maryland's Phase III goal is 350 acres for natural filters on public lands, 1,489 acres for county agricultural buffers, and 48 acres for the county urban buffers; this totals

to 1,887 acres for new forest buffers from 2018 to 2025. Maryland has planted 861 acres of buffers from 2018 to 2021, placing it on track to reach the Phase III WIP goal by 2025.

Trends in Maryland's Forest Buffer Progress

The below figure shows Maryland's rate of buffer implementation from 1996 to 2021. Initial rate of buffer planting was very high (with several years witnessing the installation of more than 100 miles per year).. This initial fast rate and subsequent decline is a function of several factors. Maryland had the first Conservation Reserve Enhancement Program (CREP) in the nation and delivered it statewide starting in 1997; a lot of the early progress was due to CREP funding of new forested buffers in locations with the most willing landowners and broader eligibility with widened buffers (out to 300 feet). After the "low hanging fruit" of buffer opportunities were planted and eligibility for wider buffers was reduced to 180 feet, progress slowed. Removal of ditches as eligible water bodies for tree planting and national guidance changes in expanding eligibility for grass buffers on pasture further constrained enrollment. During the same timeframe, staffing at the Maryland Forest Service declined by over a third, constraining proactive capacity for program expansion until recent investments in three buffer forester positions from the USDA Forest Service and Farm Service Agency. National Farm Bill changes and gaps in enrollment availability further restrained CREP progress. Barriers to landowner signup for forest buffers have consistently been the maintenance commitments, the 10- to 15-year contract length, and complexity of enrollment processes.

Significant potential exists to increase buffer planting rates, based on buffer opportunity and expanding technical and funding capacity, particularly combining climate and water quality efforts.



Guiding Buffer Implementation Strategies

Some of the guiding principles that Maryland will use to ramp up buffer planting rates include:

- Developing buffer restoration programs that are easy to navigate, so anyone who wants to plant a buffer can plant a buffer
- Providing easy options for buffer maintenance
- Protecting existing buffers from development
- Plant buffers where they are needed the most and will do the most good
- Utilize partner resources and strengths to achieve goals

Buffer Restoration

Forest Buffer Restoration Approaches and Costs

The cost of installing a riparian forest buffer depends on multiple factors, like location, site prep, size of planting stock, planting densities, who is doing the planting (contractor, staff, volunteers, etc.), and protective measures, like tree shelters. Installing a conifer buffer with bare root seedlings in a rural area can cost around $500/ acre, while installing a hardwood buffer with containerized stock in an urban environment can cost up to $20,000/ acre. Prices for supplies and labor have increased over the past few years.

Existing Programs that Fund Buffers

Conservation Reserve Enhancement Program

The Conservation Reserve Enhancement Program (CREP) is one of the most widely used federal programs for riparian forest buffers on agricultural lands. CREP is a USDA Farm Service Agency (FSA) program administered as a partnership, and includes soil rental payments to offset opportunity costs of putting the land into conservation. Maryland Department of Agriculture (MDA) provides additional cost-share assistance and the Maryland Department of Natural Resources (DNR) Forest Service provides technical assistance, planting plans, and follow-up survival inspections for tree plantings. Landowners must have a working farm with a cropping history to be eligible. Landowners receive several payments for installing a CREP practice, based on the acreage enrolled: soil rental, signup bonus, practice incentive bonus, small annual maintenance payments, and cost-share for the practice installation. The cost of implementation is paid back to the landowner, 50% through FSA and 50% through the Maryland Agricultural Water Quality Cost-Share (MACS) program. A bill in 2021 increased the percentage that MACS covered from 37.5% to 50%. Landowners also receive several bonus payments, including an $1,000/acre opportunity funded through the 2021 Tree Solutions Now Act, and an annual payment based on their soil rental rate. Planted forest buffers have to be between 35 and 100 feet and contracts last between 10 to 15 years with the option to renew.

MDA Conservation Buffer Initiative

The Conservation Buffer Initiative is a pilot program through MDA that was created in 2021 to complement CREP. It has less restrictive eligibility requirements and a more flexible contract to attract farmers who prefer a simpler program and a single one time payment. Landowners can receive up to $4,500/acre for newly planted riparian forest buffers. Planted forested buffers must be between 35 and 100ft and contracts last 10 years.

Chesapeake and Atlantic Coastal Bays Trust Fund

The Trust Fund was established in 2010 to provide financial assistance for projects that will restore the Chesapeake and Atlantic Coastal Bays by reducing non-point source pollution. A portion of the annual Trust Fund budget supports CREP bonus payments. In addition, tree

planting projects are routinely selected for funding through the Fund's annual solicitation process. For example, the Trust Fund has supported the Healthy Forest, Healthy Waters Program. This program is run through the Alliance for the Chesapeake Bay with the Maryland Forestry Foundation and technical assistance from the Maryland DNR Forest Service. It funds turnkey upland and riparian tree plantings on at least one acre on private lands and has a 10 year contract. This program is very popular among landowners due to its simple contract and turnkey nature. It also is a great example of a partnership between private and government organizations.

The Western Maryland Resource Conservation and Development Council (WMRC&D) is another organization that has received funding support from the Trust Fund. WMRC&D is a non-profit based in Garrett, Allegany, Washington, Frederick, and Carroll counties that partners with various entities like NRCS, Maryland DNR, and the Nature Conservancy to implement conservation projects, including planting riparian forest buffers. Both programs also fund needed site preparation for these tree plantings and incorporate several years of maintenance, an attractive feature.

Backyard Buffers

Backyard Buffers is a very popular tree giveaway program hosted at the county level every year. Landowners who have a waterbody on their property can sign up to receive a free bundle of 15-30 seedlings to plant and some information on how to plant and care for the trees. The species are selected by the local forester to best fit the region and can be tailored to specific landowner/participant interests such as wildlife habitat, agroforestry, etc. Every few years a survey is sent out to assess how many of the planted trees survived. The program originally started in 2000 in Frederick County and is now available in every county, except Baltimore City. The program is so popular that several counties usually sell out every year and need to implement a waiting list for the trees. Given its popularity and flexibility, it presents an opportunity for partnerships to increase capacity so more landowners can get their free trees.

Natural Resource Conservation Service Programs

The Natural Resource Conservation Service (NRCS) is a federal agency that has several programs landowners can use to plant riparian forest buffers. The Environmental Quality Incentive Program (EQIP) is a cost share program for farmers and private forest owners that offers a large selection of conservation practices, including tree planting and site preparation. The Agricultural Conservation Easement Program (ACEP) helps landowners protect their

working farms or restore and enhance wetlands through conservation easements. If land is placed in an ACEP Wetland Reserve Easement, tree planting along waterways can be implemented as part of the restoration plan. These programs are used less often than CREP to implement riparian forest buffers but might be a better fit than CREP for some landowners. While EQIP might not cover all of the costs of tree planting, it could be combined with the Woodland Incentive Program funding to increase the level of cost share.

Woodland Incentive Program

The Woodland Incentive Fund is a State cost share program for tree planting and forest management activities for private woodland owners in Maryland. It pays up to 65% of the costs of the practices installed.

New Funding Opportunities To Utilize

Tree Solutions Now Act

The 2021 Tree Solutions Now Act, also known as HB 991, sets a goal of planting 5 million trees in Maryland by 2031. These are in addition to the trees projected to be planted under programs described in the 2019 Draft Greenhouse Gas Emissions Reduction Plan. HB 991 provides $15 million of funding every year; $10 million will go towards tree planting projects in urban, underserved areas as defined by the bill through the Urban Trees Grant Program, which is administered by the Chesapeake Bay Trust. Of the remaining $5 million per year, some will go towards a $1,000 per acre bonus for new CREP riparian forest buffer plantings and some will go towards hiring 13 new contractual staff at the Maryland Forest Service. Approximately $1.25 million per year will be available to fund other tree planting in the state.

The goal for this $1.25 million is to have a 5 Million Trees umbrella program with one centralized funding application, potentially through the Chesapeake and Coastal Bay Trust Fund, Grants Gateway. There will be several outreach and partnership opportunities under the umbrella program that can be utilized to target specific tree planting needs, especially riparian forest buffers, while leveraging other funding and making use of partner resources. The proposed online funding application will include several questions to determine which partnership would be the best fit for the applicant. Partner resources should be utilized with this funding to reach as many people as possible.

Conservation Finance Act

The Conservation Finance Act is a new piece of legislation that was passed in 2022. The bill makes green and blue infrastructure projects eligible for traditional infrastructure financing and allows for private capital to be leveraged to support these projects. Riparian forest buffers are green infrastructure and this bill opens up more innovative ways to finance their planting.

Utilizing Stormwater Resources

The U.S. Environmental Protection Agency (EPA) offers Clean Water State Revolving Funds in every state. These funds are loans that can be used for a wide range of water infrastructure projects, including green infrastructure projects, like planting riparian forest buffers. They are generally under-utilized and are a great funding source for jurisdictions looking for ways to pay for planting riparian forest buffers to meet MS4 requirements.

Federal Funding Opportunities

There are several upcoming federal funding opportunities. The federal Infrastructure Investment and Jobs Act, otherwise known as the Bipartisan Infrastructure Law, is expected to provide several sources of funding that can be used for forestry projects, including funds for clean water and climate change mitigation. There is also the Recovering America's Wildlife Act, which has not yet been passed. If passed as written, it will provide $1.4 billion in funding to support wildlife conservation and restoration,which can include buffers.

Foundations

Private foundations present a great opportunity to secure funding, while maximizing outreach. Organizations like the National Fish and Wildlife Foundation (NFWF), the Arbor Day Foundation, American Forests, and corporate partnerships have many funding opportunities that can be used with other sources to support tree planting projects. NFWF has the Chesapeake Bay Stewardship Fund, which has several grant programs geared towards environmental restoration in the Chesapeake Bay, including the new Chesapeake WILD grant program. NFWF also has several other, non-Chesapeake Bay specific grant programs that can be utilized to fund buffer plantings, like the America the Beautiful Challenge (ATBC) 2022 Request for Proposals. An added benefit of working with foundations like these is that they often incorporate communications and messaging strategies, which can help attract community partners.

Expanding Planting Stock

In order to plant more buffers, production of tree stock of all sizes will need to be increased to meet this demand. Fortunately, Maryland has the John S. Ayton State Tree Nursery, which supplies most of the bare root seedlings used for tree plantings in the State. DNR leadership is working with nursery staff to expand production. The nursery is planning to hire an assistant nursery manager as part of the Tree Solutions Now Act new hires, who will help coordinate the nursery expansion as well as ramp up seed collection. DNR leadership is also coordinating with

the Maryland Nursery, Landscape, and Greenhouse Association to increase larger tree stock production, which is especially important for urban plantings.

Increasing Workforce

An essential part of planting riparian forest buffers is the workforce that provides technical assistance and physically does the planting. The Maryland Forest Service is in the process of hiring 13 new contractual positions, funded through the Tree Solutions Now Act. One of the new hires will support functions at the state nursery and the rest will support tree planting projects throughout the state.

Most tree planting projects are installed by contractors, so having a robust network of well trained contractors is integral to increasing forest buffer planting. University of Maryland Extension's Woodland Stewardship Education Program: Natural Area Management Services Webinar Series, geared towards green industry professionals, teaches the skills needed to manage small, wooded properties. The first webinar series included information on developing care plans for private woodland owners, tree health, managing deer problems, converting lawn to woodland, and invasive plant control. All of these skills are important to have when installing new riparian forest buffers. Another program designed specifically to teach green industry professionals the finer points of riparian forest buffer installation and maintenance is the Buffer Certificate Course offered by the Chesapeake Conservation Landscaping Council through their Chesapeake Bay Landscape Professional (CBLP) certification program. This certificate course offers advanced training to CBLP-certified practitioners in buffer basics, planning/implementation, and maintenance through three training sessions. Maryland plans to continue to support programs like these to educate landscape professionals who are not currently working with riparian forest buffers so they have the skills to properly do so.

Maintenance

Providing adequate maintenance to new buffer plantings is integral to their survival. Invasive species can be a huge problem in recently afforested areas. Removing and treating invasives is an important step to ensure tree planting survival. Other important maintenance steps include fixing fallen stakes and tree shelters, and removing tree shelters and bird nets when

appropriate, so the plastic does not enter the environment. Some of these activities can be performed by volunteers, like shelter fixing and removal, but other activities, like mowing invasives and spraying herbicide, need to be done by professionals with proper training. Maintenance of tree planting on private property should be turnkey and provided for at least 3 years.

Contracted

In order to most efficiently perform contractor maintenance around the state, work should be grouped by region. The new hires from the Tree Solutions Now Act, as well as current DNR employees can work within their regions to group nearby buffer plantings so they can be contracted out at a competitive rate to contractors.

Volunteer

Private and state organizations are working to develop and maintain volunteer maintenance programs for buffer plantings in Maryland. Alliance for the Chesapeake Bay has the Riparian Rangers program, which originated in Pennsylvania, and is just starting in Maryland. Volunteers check on buffer plantings every month from March to October to perform basic maintenance, like fixing fallen stakes and tree shelters, removing bird nets, and removing weeds. After their visit they report the status of plantings, including any issues, back to staff at the Alliance for the Chesapeake Bay. The program is organized by region and each region has a locally based branch leader.

Both the Chesapeake Bay Foundation (CBF) and Maryland Forest Service Staff are working with college volunteers to perform maintenance on buffer plantings. Students from around the country spend their spring break volunteering with CBF to help them perform basic maintenance on tree plantings. Maryland Forest Staff is working with volunteers from local clubs at colleges in Maryland, like the University of Maryland's Terrapin Trails Club, to visit nearby plantings and fix or remove shelters, and perform other basic maintenance.

Maryland Tree Stewards is a volunteer program from the Alliance for the Chesapeake Bay, the Maryland Forest Service and local partners where citizens assist with tree planting and maintenance. Local partner organizations organize the volunteers and the Alliance for the Chesapeake Bay provides training so the volunteers have the necessary skills to plant and care for trees.

Buffer Conservation

In order to reach the goal of 70% of riparian areas being buffered, existing buffers must be protected. This is extremely important in Maryland, where land use competition is fierce.

Buffer Protection Programs

CREP Permanent Easement Program

The CREP program has permanent easement options for landowners who have already installed a CREP practice. Landowners can choose to opt into the permanent easement program after their CREP contract expires, but landowners in Washington, Frederick, Harford, Queen Anne's, Caroline, Dorchester, Wicomico, Somerset, and Worcester counties can apply for a CREP easement before their original contract expires. Landowners can enroll all of their CREP acres into the easement program plus any adjoining lands that support the adjoining buffer and contribute to water quality and wildlife habitat up to 10 acres for every 1 acre of CREP practice. There are currently over 12,000 acres of land under a CREP permanent easement in Maryland.

Program Open Space

Program Open Space (POS) is a land acquisition program that is funded through State property transfer tax. Funds from POS can be used for the State to acquire land or can be awarded to local governments for them to acquire land. POS funds have acquired 412,000 acres of state land and more than 49,000 acres of local parks.

Rural Legacy

Maryland's Rural Legacy Program provides funding to preserve large, contiguous tracts of land and to enhance natural resources, agricultural, forestry and environmental protection while supporting a sustainable land base for natural resource based industries. The program creates public-private partnerships and allows those who know the landscape best – land trusts and local governments – to determine the best way to protect the landscapes that are critical to our economy, environment and quality of life. There are currently over 115,000 acres protected by Rural Legacy easements in Maryland.

Maryland Environmental Trust

The Maryland Environmental Trust (MET) is a division of the Maryland DNR focused on creating and maintaining conservation easements. MET works with landowners, local communities, and land trusts to purchase conservation easements. MET holds over 1,000 conservation easements, preserving nearly 140,000 acres statewide.

Department of Defense Programs

The Readiness and Environmental Protection Integration Program (REPI) and Army Compatible Use Buffer (ACUB) are programs developed by the U.S. Department of Defense to fund conservation easements. The program provides cost share funds to partners to obtain conservation easements around military bases to avoid land use conflicts, which in turn protects wildlife habitat from development. There are several naval and military bases and stations in and near Maryland, including the ones in the Naval District Washington Region and the ones in the Middle Chesapeake Sentinel Landscape Boundary.

Local Government Programs

Transfer of Development Rights (TDR) and Purchase of Development Rights (PDR) are two voluntary programs used at the local government level to conserve lands. In TDR, landowners can sell the development rights for their land to an interested party, who can use those to increase density of development at another designated location. The landowner's land is then barred from further development. With PDR, a land trust or a local, county or state agency buys the development rights on a parcel of land, primarily agricultural. After the purchase, the land cannot be developed. Unlike TDR, PDR cannot be used to offset development elsewhere in the county. Calvert County in southern Maryland has an active TDR program in place.

Buffers Protection Regulations

State Regulations

Maryland has robust laws in place that protect forest and forest buffers. The Critical Area Law established the Critical Area, which is comprised of all land within 1,000 feet of Maryland's tidal waters and tidal wetlands. It also includes the waters of the Chesapeake Bay, the Atlantic Coastal Bays, their tidal tributaries, and the lands underneath these tidal areas. The Critical Area includes the Critical Area Buffer, which is the land area immediately adjacent to tidal waters, tidal wetlands, and tributary streams. It ranges from 100ft to 300ft depending on slopes, wetland presence, and soils. Development and other land use activities are limited in the Critical Area and Critical Area Buffer. Vegetation cannot be removed from the buffer area without specific permission from the county and if vegetation is permitted to be removed, it must be replaced.

The Maryland Forest Conservation Act protects forest cover and offsets loss during development. Any activity requiring an application for subdivision, a grading permit, or a sediment and erosion control permit with disturbance greater than 40,000 square feet (approximately 1 acre) is subject to the Forest Conservation Act and will require a Forest

Conservation Plan. If trees are removed, they will have to be replaced or the removal offset by purchasing credits from forest conservation banks.

Maryland's Agricultural Regulations can also help protect forest buffers. There are restrictions on how close to streams farmers can crop and apply fertilizers, creating a vegetated "Nutrient Application Setback". For example, fertilizer can not be applied with a broadcast method within 35 feet of a waterbody. Farmers are encouraged to convert these areas to trees, due to their cropping limitations.

Local Government Regulations
Many of the county governments in Maryland have laws protecting areas around streams from encroachment. For example, in Baltimore County there is a 75ft or 100ft buffer around all streams, with width depending on their designated use. The County has also established a 25ft buffer around wetlands, floodplains, and erodible slopes. Additionally, principal buildings must be at least 35ft from a buffer. Frederick County requires developers or other large landowners, like HOAs, with property along waterways to maintain a vegetated buffer along the water and allow for public access to it.

Management

Once buffers are installed, appropriate management will help keep them healthy and functioning. Maryland DNR is currently working to develop a buffer maintenance and management handbook, which will provide recommendations for buffer maintenance actions, like appropriate harvesting locations, practices, and densities.

Buffer Outreach, Training, and Targeting

Practitioner Training

As the workforce is increased, adequate training will need to be provided to the new hires so they can gain the appropriate skills to implement and maintain forested buffers. DNR is specifically looking to diversify its workforce by changing the requirements for certain positions. This means that more people from a diversity of experiences can apply for these jobs. While this means that they might require more initial training, we believe that recruiting people with a diversity of backgrounds and experiences, like great community connections and marketing skills, will strengthen DNR.

Some of the training topics that should be covered for new employees include:

- The basics of buffer installation: species selection, spacing, site prep, tree shelters
- Tree planting maintenance: vegetation control methods, shelter maintenance
- Landowner outreach techniques: communication techniques, methods of outreach
- How to finance buffers: leveraging partner resources, applying for grants

In addition to training new conservation practitioners, regular trainings and resources should be made available for current members of the workforce to keep them refreshed and up to date on the science and new techniques.

Some of the topics that should be covered for continuing education include:

- Invasive species management techniques
- Farm friendly design
- Updates on new funding sources

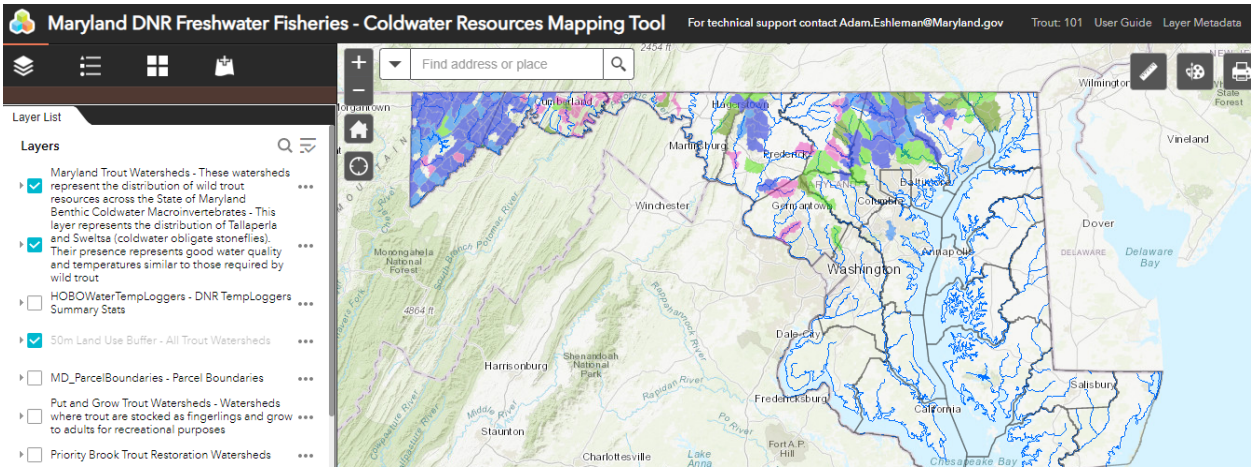
Forums for sharing resources, like Chesapeake Network (https://www.chesapeakenetwork.org/) and Chesapeake Riparian Forest Buffer Network (https://chesapeakeforestbuffers.net/) should be utilized to share events and resources. Additionally, events like Pennsylvania's Watershed Forestry Summit, hosted by the Department of Conservation and Natural Resources and Western Pennsylvania Conservancy, are great places to stay up to date on buffer techniques. A group of state agencies in the Chesapeake Bay Watershed, including the Maryland DNR, and private organizations are looking to host a buffer roundtable series, which will be another good forum for information exchange among buffer practitioners.

Areas to Target Buffer Planting

Buffers for Wildlife

While funding for riparian buffers can be used throughout the state, outreach will be directed to locations that will most benefit wildlife and aquatic organisms to focus limited resources. Restoring riparian forest buffers will improve habitat for brook trout, freshwater mussels, and bird species that rely on early successional forest. Riparian trees shade the stream which mitigates temperature extremes that can kill cold water species, like brook trout. Riparian trees also provide carbon inputs into streams, which create fish habitat and are a food source for insects that trout rely upon. Additionally, brook trout benefit from the water quality enhancements that streamside trees provide. A recent DNR analysis found that riparian forest cover is one of the best predictors of brook trout occurrence.

Maryland DNR Freshwater Fisheries put together the Coldwater Resources Mapping Tool which has spatial data on coldwater species, including watersheds with trout, watersheds with coldwater obligate insect species, and priority brook trout restoration watersheds. Ten areas were identified as priority restoration watersheds providing the greatest opportunity for brook trout persistence into the future and are, therefore, good candidates for habitat restoration projects. Targeting riparian tree planting in these watersheds will increase the quality and connectedness of brook trout habitat in areas that are critical to future success. DNR hopes to utilize funds from the Tree Solutions Now Act to help fund buffer plantings on private land within brook trout watersheds. It will also be important to conserve the existing forested buffers in these watersheds to ensure that existing riparian forest cover is maintained.



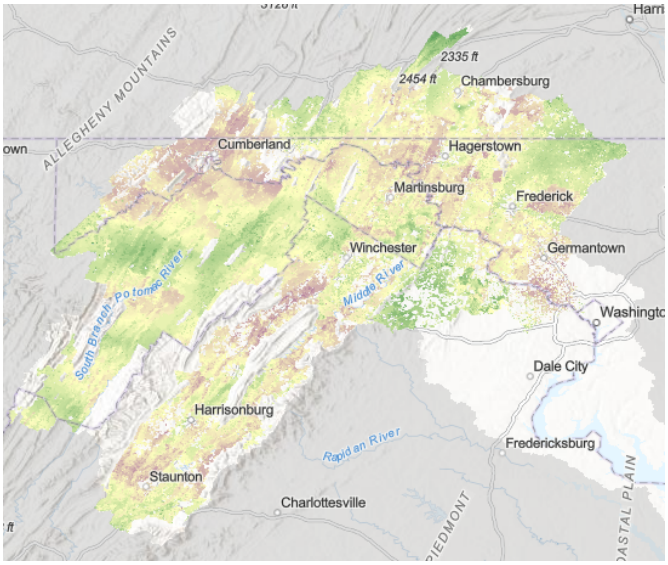
Freshwater mussels also benefit from the water quality improvements that forested buffers provide. Excess sediment in the water can harm mussels by clogging gills and disturbing metabolic processes. Priority watersheds for freshwater mussels include Sideling Hill Creek and Town Creek in the upper Potomac River Watershed, Nanjemoy Creek and McIntosh Creek in the lower Potomac, Hawlings River in the Patuxent Watershed, and Three Bridges Branch, Longmarsh Ditch and Brown's Branch on the Eastern Shore. Targeting tree plantings along these creeks as well as across the landscape, will greatly reduce sedimentation and improve

freshwater mussel habitat. Maryland DNR is currently leading a multi-state,U.S. Forest Service Landscape Scale Restoration Grant geared towards habitat restoration and landowner engagement on the Delmarva Peninsula, which includes Delaware and parts of Virginia. One of the focal areas for this work will be the Brown's Branch Watershed in Queen Anne's County, which is one of the few watersheds in Maryland where the federally endangered dwarf wedgemussel (*Alasmidonta heterodon*) is found. The grant will fund riparian buffer tree planting, with a focus on expanding and connecting existing buffers, to improve water quality for the mussel.

Riparian forest buffers benefit terrestrial wildlife as well. They can often be the only forested areas of landscape, especially in areas that are highly developed or dominated by agriculture. These forested buffers provide safe corridors for wildlife to live and travel. Newly planted buffers also play an important role in a dynamic habitat mosaic. They provide young forest habitat, which is important for birds like bobwhite quail, ruffed grouse, golden-winged warbler, and cerulean warbler. Targeting planting new buffers in areas where these species exist, or have the potential to exist, could have outsized benefits to their populations.

Drinking Water Resources

Riparian forest buffers increase drinking water quality by filtering nutrients and sediments and keeping temperatures cool, which inhibits growth of pathogens. The Potomac River Basin Drinking Water Source Protection Partnership developed the Land Prioritization Mapping for Protecting Drinking Water Quality Tool which identifies and prioritizes parcels that have a large impact on drinking water resources. Targeting the nonforested parcels for riparian afforestation and the forested parcels for conservation could have significant benefits for drinking water resources for the downstream communities.



MS4 Municipalities

Riparian forest buffers have been an underutilized tool for MS4 communities to meet their permitting requirements and present an untapped opportunity for planting new buffers. The Maryland Department of the Environment (MDE) recently increased the stormwater compliance credit that MS4 communities receive for planting riparian forest buffers from 38% to 150% under new guidance approved in November 2021. This means that if a local government plants one acre of riparian forest buffer, it can receive compliance credit equivalent to one and a half acres of credit. MDE also recently released a new tool called the Maryland Forest Financing Implementation Tool (MD FFIT), which is a calculator that governments and partners can use to

explore funding options for forestry projects to fulfill MS4 requirements. MDE held a webinar on April 6, 2022 on how to use the tool and estimate project benefits to maximize cost effectiveness. Additionally, Alliance for the Chesapeake Bay was recently awarded a U.S. Forest Service Landscape Scale Restoration Grant to fund outreach to MS4 communities in order to provide assistance on how to use the tool, including webinars on its use, field tours of existing sites, and tree planting technical assistance. The increase in crediting and the new financing tool should make planting forest buffers a much more attractive option for stormwater mitigation.

Conserved Private Lands

Lands encumbered with easements present a funding gap, as well as an opportunity for new forest buffers. Many easement programs do not allow landowners access to cost share programs, which excludes them from funding opportunities for plating riparian forest buffers. Additionally, some easement programs require riparian areas to be forested, but do not provide any assistance to plant and maintain them. Creating a program that provides cost share for planting and maintaining forest buffers will fill this funding need. Targeting plantings on conserved lands also have the added benefit of ensuring that buffers are protected.

National, State, and Local Parks

Similar to conserved private lands, state and local parks have the benefit of existing protections to prevent development. Some of Maryland's State Parks have agricultural leases which may present some opportunities for reforestation. National Park land, such as the C&O Canal, and local parks should be examined as potential planting sites..

Urban Riparian Forest Buffers

Maryland has seen increased programmatic support for planting urban trees. The Chesapeake Bay Trust's Urban Trees Grant Program through the Tree Solutions Now Act is another resource to increase urban forest buffers. The program provides $10 million in grant funding for tree planting projects in underserved urban areas, as defined by the bill. The Maryland Urban and Community Forestry Committee (MUCFC) has a new grant with the Maryland Department of Transportation (MDOT) for areas impacted by transportation construction.

There are also opportunities to increase funding for urban buffers. The Backyard Buffers free tree giveaway program sells out in many counties every year. Given its popularity, this program has the potential to reach more people if supplies are increased, potentially through partner organizations. There is also potential to install new urban forest buffers by working with other infrastructure projects. Adding the planting of riparian forest buffers to new infrastructure projects could lower the costs of planting the trees by pairing them with other work.

Outreach Methods

One of the primary challenges to installing more riparian forest buffers is landowner interest. Effective outreach to private landowners will be an essential part of increasing buffer plantings.

Targeting outreach to landowners in priority areas, like brook trout habitat, will be a good first step. Outreach methods could include sending educational mailers to landowners in watersheds with high conservation value and having face-to-face interaction at local events, like farmers markets, among other strategies. Word of mouth is a particularly valuable tool in attracting more landowners to planting programs. To support this outreach approach, good relationships with landowners currently enrolled in programs must be sustained, and plantings should be well maintained so they look appealing to other landowners. The Chesapeake Tree Canopy Network (https://chesapeaketrees.net/) has a lot of great resources focused on tree benefits and outreach strategies that could be utilized.

Improving online resources can help connect willing landowners to the right planting program. Maryland DNR is working to develop a website with some simple questions landowners can answer about their desired tree planting outcomes which will direct them to information on the planting program that is the best fit for them. Including brief, informative descriptions of the planting programs that include incentives, benefits, and contract information will help landowners make informed decisions.

Maryland's 5 Million Tree Campaign, through the 2021 Tree Solutions Now Act, presents a great opportunity to engage with the public about tree planting. There is an official logo for the campaign and the State will continue to develop outreach materials focused on the campaign, including a website and potentially a public facing tracking tool.

Buffer Tracking

Maryland tracks forest buffer status via the Riparian Forest Buffer Initiative Database, which is a Microsoft Access database housed on an internal DNR server. This database has planted forest buffer data from 1996 to the present and includes detailed information on buffers, including size, composition, location, and financial assistance. Foresters fill out buffer forms after providing technical assistance at the planting, and send the forms to the Chesapeake Watershed Forester, who enters them and maintains the database. The data is the source for the riparian forest buffers on agricultural land BMP that the Maryland DNR submits every year as part of Bay Reporting. The riparian forest buffers, and other BMPs, included in Bay reporting have a quality assurance project plan (QAPP) that is maintained to ensure proper and consistent methods are followed.

In 2021, shapefiles outlining planting areas were added as part of the buffer tracking. The Maryland DNR will continue to update tracking methods, as necessary,to improve efficiency and efficacy.

Coordination and Leadership

Partnerships

Maryland Stream ReLeaf Committee

The Maryland Stream ReLeaf committee is a group of state, federal, and private partners in Maryland who work with forest buffers; Maryland DNR Forest Service provides coordination. This group has been meeting several times a year since 1997 to discuss all riparian forest buffer-related things and contribute to Maryland's forest buffer strategy. At the meetings there are usually several presentations about new resources for implementing and managing buffers as well as time to discuss strategies for increasing and maintaining buffers in the State. Since the start of Stream ReLeaf, the group has helped write three buffer plans for Maryland.

Upper Potomac Buffer Strategy

The Upper Potomac Buffer group is a multi-state buffer coordinating group focused on the upper drainage of the Potomac River in Maryland, Pennsylvania, West Virginia, and Virginia. The group has the goal of increasing forest buffer restoration and conservation in the multi-state drainage area and building on knowledge gained from the concentrated flow and invasive species occurrence field work. The work is supported by a National Fish and Wildlife Foundation grant to improve outcomes of riparian forest buffers. This group has met four times since its inception in Fall 2021 and has identified brook trout habitat and drinking water resources as its two main priorities to target buffer restoration and conservation. In Summer 2022 the group will produce a forest buffer strategy for the region, outlining resources and strategies in the four states that can be used to increase buffer coverage in the drainage. They will also produce an online map summarizing the plantable space within the drainage's riparian zone and current amount of forested riparian buffer using the newly released 2017/2018 high resolution land cover data.

Chesapeake Bay Program Forestry Workgroup

Staff regularly attend the Chesapeake Bay Program's Forestry Workgroup meetings. The monthly meetings serve as a coordination point among the states to discuss new forestry and forest buffer research, stay updated on forestry activities in the watershed, and discuss plans to advance forest buffers and tree canopy coverage. The workgroup supports the 2014 Chesapeake Bay Watershed Agreement vital habitat goal.

Healthy Forests, Healthy Waters

Healthy Forests, Healthy Waters is an example of a successful public-private partnership focused on riparian forest buffers in Maryland. It is a collaborative effort, where the Alliance for the Chesapeake Bay coordinates with private landowners interested in tree planting, the Maryland Forest Service provides technical assistance and planting plans, and the Maryland Forestry Foundation handles grant administration. The program is supported by a grant through

the Maryland Department of Natural Resources' Chesapeake and Coastal Bays Trust Fund as an innovative approach to reduce the amounts of nutrients and sediments entering waterways.

Coordination Within Maryland State Government

Buffer enhancement requires the support and cooperation of multiple state agencies.. The Maryland Department of Natural Resources (DNR) takes the lead on the technical forestry assistance, works directly with landowners, and coordinates many of the tree planting programs. The Maryland Department of Agriculture (MDA) leads tree planting on agricultural lands by administering CREP and administering the Conservation Buffer Initiative. The Maryland Department of the Environment (MDE) coordinates stormwater mitigation and is actively working to make tree planting more commonly used to mitigate stormwater impacts. These three agencies have open lines of communications and frequently collaborate on projects together. Staff at DNR, MDA, and MDE participate in Stream ReLeaf meetings.

Regional Coordination Opportunities

Continuing to work with the other Bay States will allow Maryland to share and leverage resources. There are several grant opportunities that the Bay States can apply for together to fund riparian forest buffer work, like the U.S. Forest Service's Landscape Scale Restoration (LSR) grants. Maryland, Delaware, and Virginia are currenting collaborating on a LSR grant focused on restoring wildlife habitat on the Delmarva Peninsula. The U.S. Department of Agriculture has Climate-Smart Agriculture and Forestry grants that also present an opportunity for regional coordination. Additionally, Maryland plans to continue to share and participate in multi-state training resources, such as Pennsylvania's annual Watershed Forestry Summit.

Priorities and Conclusions

In December of 2021, Maryland Stream ReLeaf members ranked their priorities for buffer restoration, conservation, outreach and targeting, and leadership and coordination for implementation from 2022 to 2025. Below are the top priorities identified in each category:

Buffer Restoration

- Expand funding options to increase eligible areas and meet planting needs, coordinate with federal and state funds
- Expand tree planting stock in seedling, containerized, and other sizes
- Provide expanded technical assistance for planting programs, like CREP, to avoid delays and backlogs
- Expand capacity for tree planting and maintenance through multiple means such as trained contractors, maintenance crews, and coordinated volunteer efforts
- Build awareness of technical capacity needed to deliver multi-functional forest buffers with non-timber products
- Develop options for planting and maintaining buffers on conserved lands

Buffer Conservation

- Expand awareness of buffer conservation programs
- Work with partners to optimize tree retention during stream restoration projects
- Expand the CREP Permanent Easement Program
- Update the assessment of existing buffers, including how many are protected
- Utilize carbon markets to protect forest buffers

Buffer Outreach, Training, and Targeting

- Train new staff and contractors in important forest buffer restoration skills, like planting, natural regeneration, invasive species control, allied practices, and farm friendly design
- Target landowners in high-function buffer restoration and conservation areas
- Coordinate with local governments to share resources and support programs that meet their needs, like stormwater mitigation
- Develop outreach efforts for hunting and wildlife-focused communities in partnership with fisheries and wildlife organizations
- Share local case studies on successful buffers

Leadership and Coordination

- Maintain interagency coordination and conservation partnerships
- Coordinate buffer restoration and conservation with climate resiliency and other planning efforts
- Coordinate with county and regional groups for buffer restoration and conservation

The below table outlines the two year priorities for Maryland's buffer program:

Topic	Lead	Steps to Achieve Goal	Deliverables
Landowner Outreach	DNR	Expand information through DNR Communications/ webpage. Coordinate inclusion of buffers in 5MT marketing	Accessible website with information on planting programs
Expanded Funding and Financing	MDE	Report progress by programs to identify use over different tree planting opportunities and program gaps in coordination with DNR, MDA, CBT,, others. Identify opportunities in the Conservation Financing Act and pay-for-performance approaches to increase rate of buffer adoption, Coordinate funding opportunity information among partners	Matrix of funding options and tree planting opportunities, feeding communications efforts, FFIT tool updates, buffer restoration tracking as part of 5 Million Trees tracking and reporting
Maintenance	DNR	Coordinate priority for buffer plantings in contracted maintenance assistance through 5MT. Utilize regional staff to group maintenance. Explore options for maintenance through carbon markets	Expanded options for buffer maintenance, training available to contractors interested in delivering affordable buffer maintenance services
Planting Stock	DNR	Regular meetings with MD Nursery, Landscape and Greenhouse Association, Develop information on desired species and sizes of larger tree planting stock, Pursue potential for advance purchase contracts to stimulate production; develop more native tree seed collection mechanisms for seedling nursery	Expanded production and species selection
Technical Assistance	DNR	Identify and communicate staffing priorities among partners. Pursue rapid hiring and filling of vacancies, develop robust training with a combination of field and online training and mentorship, continue contractor training	Increased technical assistance staff in affected agencies and organizations, established training program, contractor training offered 2+X/yr.
Targeted Buffer Planting	DNR, MDE	Identifying target watersheds and communities for tree planting priorities. Develop targeted outreach. Facilitate partnerships with relevant groups (i.e. Trout Unlimited for plantings in trout watersheds)	Funding options for buffers in the different priority areas outlined in strategy

Forest Buffer Conservation	DNR	Evaluate forest loss patterns in buffers, summarize progress from existing programs, and develop conservation needs/strategy.	Report summarizing patterns of forest loss and protection in riparian area, recommendations for future needs
Keeping and Improving CREP	CREP Advisory Committee, led by MDA	Partner input into 2023 Farm Bill. Expand reporting of CREP benefits for wildlife and climate resilience	Progress and opportunities for improvement in Annual CREP Report
Stream ReLeaf Coordination and Buffer Tracking	DNR	2 + meetings a year, annual reporting with MDA to MDE for Chesapeake Bay and Climate reporting	Current buffer strategy and reporting

Metrics to Track

- **Buffer planting acres** and **miles** by year, county, and watershed
- **Current forest and tree canopy in 100-foot stream and shoreline buffers**- high-res data- acres and percent by state, county, watershed every 3 years, subject to data availability
- **Trends of loss and gain in forest and tree canopy in buffers**- acres by state, county, watershed
- **Number of species and inventory of tree seedlings** at the State Nursery (private growers as available)
- **Annual summary of additional training** or mentorship needs
- **Annual summary of funding gaps** for restoration and maintenance

Conclusions

Maryland has a strong foundation of existing programs and collaboration along with new opportunities that provide the State with the potential to increase buffer restoration and conservation to help meet the Chesapeake Bay Program's riparian forest buffer goal.
This document will serve as a catalog of resources and provide guidance as Maryland's buffer program is expanded over the next few years.