



# Forestry Best Management Practices for

# PENNSYLVANIA

Pennsylvania is working with neighboring states to clean up our shared local waters that run to the Chesapeake Bay. This effort is the Phase 3 Watershed Implementation Plan (Phase 3 WIP). The path to success starts locally with landowners and local governments.

This document summarizes five forestry practices that reduce nitrogen and phosphorus pollution. Goals, cost estimates and pollution reduction forecasts are included for each practice.



## Forested Riparian Buffers

**Action: Plant trees and shrubs or grassy vegetation along streams.**

**Goal 1:** 83,000 acres of forested riparian buffers on agricultural lands  
**Goal 2:** 2,650 acres of forested riparian buffers in developed areas  
**Estimated annual cost: \$41.4 million**

**Nitrogen runoff reduced by  
7,445,000 lbs, or 15% of PA's Goal**

**Phosphorus runoff reduced by  
993,000 lbs, or 48% of PA's Goal**

**Riparian forest buffers (RFBs)** are trees and shrubs planted along streams to capture water and pollution that flows from the land into the stream. They are cost-effective for reducing pollution, help reduce flooding, and provide wildlife habitat. There are many programs to help landowners plant and maintain buffers in agricultural and developed areas. Buffers can be planted on cropland, pastures, backyards, community parks, schools and businesses, and more.

### Action Steps to reach these goals:

1. Leaders commit to making buffers a priority
2. Education and outreach highlight the benefits/challenges of planting RFBs
3. Financial assistance and incentives
4. Farmers have access to technical assistance
5. Programs include site prep/maintenance
6. Outreach highlights success stories/annual progress
7. Buffers planted wide as possible for maximum benefit
8. Effort is made to keep existing buffers in place

## Tree Canopy

**Action: Plant trees in developed areas.**

**Goal 1:** 50 acres of urban tree canopy planted (15,000 trees)  
**Estimated annual cost: \$5,400 (annualized over 75 years)**

**Nitrogen runoff reduced by  
180 lbs, or <1% of PA's Goal**

**Phosphorus runoff reduced by  
10 lbs, or <1% of PA's Goal**

**Tree canopy** is increased by planting trees along streets, in yards, and in other developed areas. Trees catch stormwater and reduce flooding, and help keep pollution from reaching local waterways. Co-benefits of tree canopy include improved air quality, increased wildlife habitat, reduced erosion, cooler temperatures in urban areas, increased property values and improved human health.

### Action Steps to reach these goals:

1. Offer more technical/financial assistance
2. Expand citizen engagement and education
3. Invest in community tree conservation/maintenance
4. Leverage other tree programs such as MS4, county planning, and local zoning to encourage tree planting

For more information or to get involved in local planning efforts, please visit <http://dep.pa.gov/chesapeakebay/phase3>.

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## Woods and Pollinator Habitat

Action: Convert lawn and turf areas to woods and meadows.

Goal 1: 5,000 acres of lawns to woods  
 Goal 2: 5,000 acres of lawns to meadows  
 Estimated annual cost: \$1.1 million

Nitrogen runoff reduced by  
 86,000 lbs, or <1% of PA's Goal

Phosphorus runoff reduced by  
 5,300 lbs, or <1% of PA's Goal

Woods and meadows planted with native plants reduce pollution, create habitat for pollinators, sequester carbon, and provide opportunities to interact with nature. Pollinators (bees, butterflies, birds, and other insects) are critical for food and flowers. Pennsylvania's Chesapeake Bay watershed contains over one million acres of turf grass. Homeowners or landscapers can easily restore a lawn to woods or meadows. Doing so reduces fertilizer, fuel and maintenance costs. They also take less time to maintain.

Action Steps to reach these goals:

1. Communicate benefits of planting trees/meadows
2. Provide funding opportunities for communities and property owners
3. Expand capacity and create jobs by providing training for contractors
4. Provide basic training to maintenance staff and homeowners
5. Leadership/tech assistance by Agencies/non-profits

## Forest, Farm and Natural Areas Conservation

Action: Provide credits for land conservation and revise zoning and ordinances to conserve existing natural areas.

Goal 1: 20,000 acres of land conserved annually  
 Goal 2: 12,000 acres of farmland preserved annually through the current program  
 Estimated annual cost: Cannot be determined due to variations in the cost of land "crediting" programs across the watershed

Nitrogen runoff reduced by  
 TBD lbs or TBD% of PA's Goal

Phosphorus runoff reduced by  
 TBD lbs or TBD% of PA's Goal

Forest and natural area conservation is an important step in improving water quality and restoring habitats valued by local communities. Working lands such as farms and forests are deeply rooted in Pennsylvania's cultural heritage and contribute significantly to the rural economy. The Phase 3 WIP includes a basic framework for "crediting" land conservation actions, programs and policies.

Action Steps to reach these goals:

1. Invest in state-level programs for conserving and managing forests
2. Support local land conservation efforts
3. Local governments use comprehensive planning to include forests and natural areas in the community
4. Help landowners/farmers with long-term conservation planning

## Stream and Wetland Restoration

Action: Support efforts to restore local streams and wetlands.

Goal 1: 60,000 linear feet of urban and non-urban streams restored per year utilizing appropriate measure for the site such as stabilization, natural stream channel design, flood plain restoration, etc.  
 Goal 2: 400 acres of wetlands restored per year  
 Estimated annual cost: \$27.3 million

Nitrogen runoff reduced by  
 147,000 lbs, or <1% of PA's Goal

Phosphorus runoff reduced by  
 29,000 lbs, or 1% of PA's Goal

Streams and wetlands across Pennsylvania's landscape have been drained, diverted or altered. Agriculture and urban development have played a major role in this. Restoring streams and wetlands will reduce pollution, increase wildlife habitat, provide recreation opportunities, and reduce flooding.

Action Steps to reach these goals:

1. Renew efforts to conserve/protect wetlands
2. Integrate with BMP use on farms/developed areas
3. Integrate stream/wetland restoration into MS4
4. Update local planning/zoning to conserve streams and wetlands during development

## Cumulative Results of Recommended BMP Implementation

Action: All of the action steps are implemented in Pennsylvania's Chesapeake Bay watershed counties.

Total Estimated Annual Cost: \$67.7 million

Nitrogen runoff reduced by  
 7,681,000 lbs, or 15% of PA's Goal

Phosphorus runoff reduced by  
 1,029,000 lbs, or 50% of PA's Goal

## Additional Recommendations and Action Steps

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Pennsylvania provides the following additional recommendations:

- 1. Awareness.** The power of trees and forests to reduce pollution is not always obvious. Education and outreach efforts will help to communicate the economic, environmental, human health, and water quality benefits of planting trees and conserving forests.
- 2. Commitment and Leadership.** State and local leaders have invested tremendous time and energy in developing a watershed restoration plan. It will be critical to support the planning effort with resources needed for implementation.
- 3. Staff and Training.** State and partner organizations lack the staff to support full implementation of the Forestry BMPs. Innovation and partnerships will be keys to success.
- 4. Cultural.** Trees and natural areas are often viewed as “messy,” or vacant lands that have little or no value. Adding trees to farms and communities will require shifts in how we view our landscapes. For example, riparian forests could be planted with trees and shrubs that provide food or other products for personal use or minimal economic return.
- 5. Timing.** Current funding options take several years to get trees in the ground. Identifying more efficient means for funding can speed up implementation and better meet landowner needs.
- 6. Finances.** Planting meadows and riparian buffers can be expensive and time-consuming for individual property owners. Streamlining funding will be critical for success.
- 7. Tracking.** Communicating progress, success, and lessons learned is critical to implementing the plan. Efforts are underway to improve communications and provide web-based tools for planning, tracking and analyzing BMP use.
- 8. Scale.** To reach these goals, agency staff and partners will have to assist—and monitor—thousands of individual property owners, farmers, and municipal organizations.

## Resource Needs

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To reach these goals, the state, local governments and landowners will need additional support:

- 1. Technical assistance for riparian buffers, tree canopy, and lawn to trees and meadows will need to significantly increase.** To meet WIP goals by 2025, dozens of foresters and natural resource professionals are needed to support partner NGOs, agencies, and County Conservation Districts.
- 2. Financial assistance for BMP design and implementation.** Significant funding is needed to support the implementation of forestry BMPs.
  - a. It will cost over \$60 million/year to fund recommended forestry BMPs through 2025.
  - b. Easy access to this funding and flexibility is needed to encourage BMP implementation.

For more information or to get involved in local planning efforts, please visit <http://dep.pa.gov/chesapeakebay/phase3>.

# Action Steps

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## Pennsylvania will take the following action steps to support nutrient reduction efforts:

### 1. Communications and Outreach.

- 5.1.1 – Implement a comprehensive communication/outreach strategy to engage farmers/landowners in planting and maintaining riparian forest buffers.
- 5.1.2 – Implement a communication/outreach program to engage a variety of turf owners to plant trees and meadows on their properties.
- 5.1.3 – Communicate the importance and values of forests to facilitate and encourage state and local land conservation programs.
- 5.1.4 – Emphasize the full range of benefits and co-benefits of stream and wetland restoration to facilitate additional implementation.

### 2. Funding and Resources.

- 5.2.1 – Maximize existing funding sources for riparian forest buffer implementation in Pennsylvania.
- 5.2.2 – Expand TreeVitalize and utilize other programs to facilitate community tree planting and maintenance.
- 5.2.3 – Create additional flexible funding options for riparian forest buffers.
- 5.2.4 – Ensure maintenance of implemented riparian forest buffers through adequate funding and resources.
- 5.2.5 – Continue and increase urban tree canopy grants to communities and non-governmental organization's partners.
- 5.2.6 – Leverage existing funding sources for stream and wetland restoration.
- 5.2.7 – Develop funding opportunities for turf conversion programs.
- 5.2.8 – Continue to implement stream restoration, emphasizing creditable, load-reducing projects. Pair stream restoration projects with tree planting BMPs, whenever possible. Identify areas that may have a high cost-to-benefit ratio for load reductions for legacy sediment removal and associated ecosystem restoration.

### 3. Expanding Capacity for Technical Assistance.

- 5.3.1 – Increase technical assistance available to landowner's interest in implementing riparian forest buffers.
- 5.3.2 – Increase urban forestry technical assistance available to communities and citizens.
- 5.3.3 – Create a turf conversion technical assistance program.
- 5.3.4 – Provide informed technical assistance for stream and wetland restoration projects to ensure they are completed in an adequate, reportable manner.
- 5.3.5 – Look into feasibility of expanding the PA Fish & Boat Commission Stream Restoration Initiative, implementing stream restoration projects resulting in load-reductions with habitat co-benefits, to counties in the southcentral region of the state, starting with one or more of the four Phase 3 WIP pilot counties (Adams, Franklin, Lancaster, York).

### 4. Reporting and Tracking Progress.

- 5.4.1 – Ensure adequate tracking of partner-implemented forestry BMPs including forest buffers, tree canopy, conservation landscaping, urban forest expansion, stream wetland restoration.
- 5.4.2 – Celebrate successful implementation and maintenance of forestry BMPs through reporting successful efforts.
- 5.4.3 -- Work with the U.S. EPA Chesapeake Bay Program Partnership to establish crediting protocols for legacy sediment removal projects in the Chesapeake Bay Model.

