

Pennsylvania Numeric Milestones 2022-2023
Phase 3 Chesapeake Bay Watershed Implementation Plan

**Prepared by the
Pennsylvania Department of Environmental Protection**

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Commonwealth of Pennsylvania

DISCLAIMER

The policies and procedures outlined in this document are intended to supplement existing requirements. Nothing in the policies or procedures shall affect statutory or regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of the Department of Environmental Protection (DEP) to give this milestone plan that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this milestone plan if circumstances warrant.

Nothing contained in this document shall be construed to establish a legal requirement on the part of the Commonwealth of Pennsylvania to appropriate funds, or to require the Commonwealth or any agency thereof to take actions not authorized by law.

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Executive Summary

The Pennsylvania Department of Environmental Protection (PADEP) presents these 2022 through 2023, 2-Year Numeric Milestones as specified in the 2014 Chesapeake Bay Watershed Agreement and applicable US Environmental Protection Agency (USEPA) grant guidance. The 2-year plan has been developed from Pennsylvania's Phase 3 Watershed Implementation Plan (WIP) with guidance from the Chesapeake Bay Partnership Water Quality Goal Implementation Team and the Milestones Workgroup. The 2-year plan details 20 of the Best Management Practices (BMPs) that will be implemented according to our WIP through 2023. Numeric targets were developed for the BMPs that comprise 60% of Pennsylvania's nitrogen reductions and those BMPs that will see a 10-fold increase, based on the recommendations provided in the Chesapeake Bay Program's *Evaluation of Pennsylvania's Phase III Watershed Implementation Plan, December 2019* (Evaluation). Numeric targets were also developed for a few additional BMPs specifically relevant to Pennsylvania but not identified in the Evaluation.

The implementation of these practices is forecast for 2-year milestone periods through 2025 as shown in Table 1. The orange lines in the graphs depict BMPs submitted as well as adjusted for multi-year practices to include BMPs that were deleted in 2019, 2020, and 2021 due to credit duration expiration. BMP acres that were "backed out" of the modeling tools are included as they are submitted, however the cumulative reduction value of those management actions may not be fully realized in the modeled progress. The blue lines in the graphs depict the original numeric milestone trajectory from the 2020-2021 Numeric Milestone commitments, with 2019 as the initial year based on modeled and credited progress. Implementation levels beginning in 2019 and beyond the 2-year milestone period of 2023 are included to show anticipated implementation and trends through 2025. Countywide Action Plans (CAPs) have been developed for all 34 counties in the Tier 1, Tier 2, Tier 3, and Tier 4 priority geographies. These milestones are intended to track overall state progress and reasonable assurance in meeting 2025 WIP objectives.

Introduction

The numeric 2-Year Milestone BMP implementation targets were developed from the final scenario in Pennsylvania's Phase 3 WIP. The BMPs reviewed and provided in this document are taken from USEPA's *Evaluation of Pennsylvania's Phase 3 WIP, December 2019* (Evaluation), which focused on practices that meet 60% of the nitrogen reductions as well as those that will see a 10-fold increase or more in implementation through 2025. There are four additional practices that Pennsylvania decided to highlight as well.

Phase 3 WIP – 60% of the Nitrogen Reductions

- Nutrient Management – Core Nitrogen
- Soil Conservation and Water Quality Plans
- Cover Crop – Rye, Normal, Drilled (Traditional)
- Cover Crop – Rye, Normal, Drilled with Fall Nutrients (Traditional with Fall Nutrients)
- Tillage Management – Continuous High Residue Management (>60% residue)
- Animal Waste Management Systems
- Grass Buffers
- Forest Buffers
- Forest Buffers with Streamside Exclusion Fencing

Phase 3 WIP – 10-fold Increase

- Grass Buffers with Streamside Exclusion Fencing
- Prescribed Grazing
- Manure Incorporation/Injection
- Urban Stream Restoration
- Urban Nutrient Management
- Bioswales
- Grey Infrastructure – Illicit Discharge Detection and Elimination (IDDE)

Phase 3 WIP – Additional BMPs

- Runoff Reduction (RR) Stormwater Performance Standard
- Conservation Tillage (30% - 60% residue)
- Wetland Restoration
- Non-urban Stream Restoration
- Land Conservation Policy

The milestones presented are based on a linear implementation schedule through 2025. However, this is not the case for two of the BMPs: Animal Waste Management Systems (AWMS) and Urban Nutrient Management.

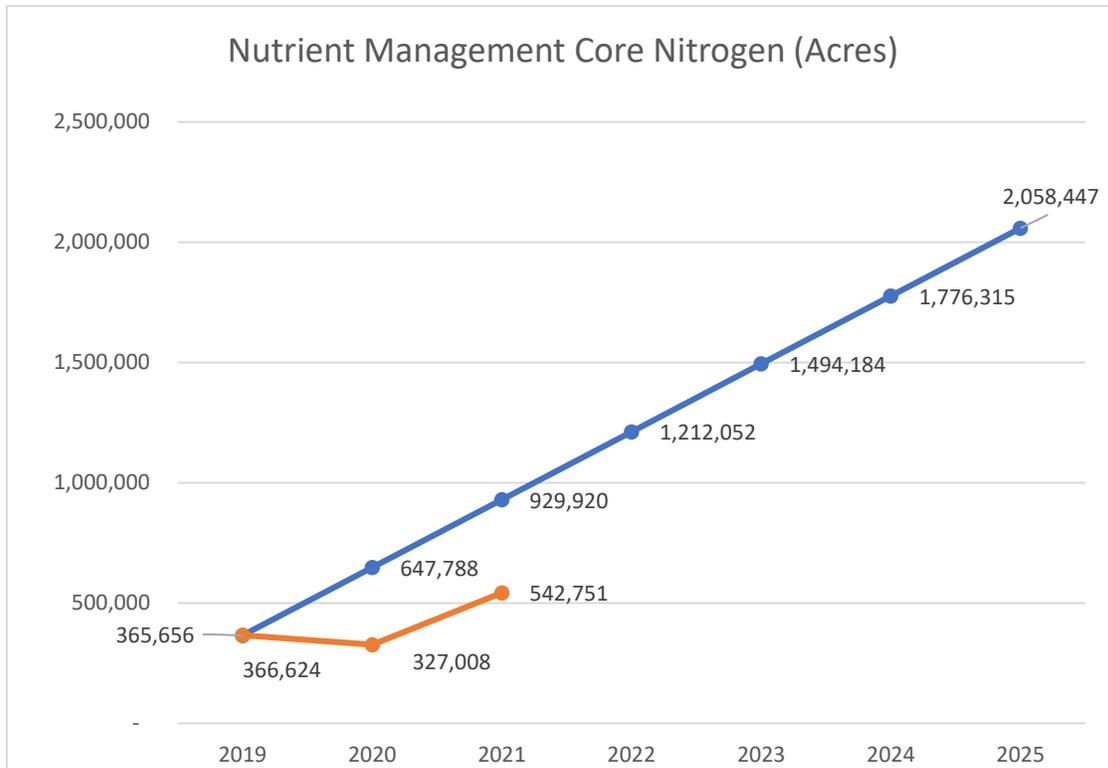
- AWMS implementation was forecast with delayed implementation due to the need for licensed Professional Engineers (PE) for design of liquid AWMS as well as a significant need for more qualified technical assistance in order to design and oversee implementation of both solid and liquid AWMS.
- Urban Nutrient Management was forecast with delayed implementation due to the connection between the Fertilizer Bill legislation and implementation of nutrient management in the developed/urban land use.

Data reporting specifics are detailed in Pennsylvania's Quality Assurance Project Plan (QAPP) for Chesapeake Bay reporting (revised December 2021). CAP goals for BMP implementation can be found in the plans, published on the DEP [Countywide Action Plans](#) website. Information specific to the verification of BMPs can be found in Pennsylvania's BMP Verification Program Plan (revised December 2021), which is an addendum to our QAPP. Both the QAPP and BMP Verification Program Plan are published on the [Tracking Pennsylvania's Progress](#) website.

These numeric milestones are also cross-referenced to programmatic milestones developed by PADEP to support the WIP during this 2-year period. The BMPs for which numeric milestones are included herein constitute a portion of those included in the Phase 3 WIP. Our Programmatic 2-Year Milestones document aims to address all BMPs included in the Phase 3 WIP.

	Unit	Baseline	2020-2021 MS		2022-2023 MS		2024-2025 MS	
		2019	2020	2021	2022	2023	2024	2025
<i>Best Management Practices (60% N Reduction)</i>								
Nutrient Application Management Core Nitrogen	Acres	365,656	647,788	929,920	1,212,052	1,494,184	1,776,315	2,058,447
Soil Conservation and Water Quality Plan	Acres	387,127	708,372	1,029,616	1,350,861	1,672,105	1,993,350	2,314,594
Cover Crop, Traditional	Acres	170,635	180,188	189,742	199,295	208,848	218,402	227,955
Cover Crop, Traditional with Fall Nutrients	Acres	14,428	94,768	175,109	255,449	335,790	416,130	496,470
High Residue Tillage Management	Acres	597,766	639,880	681,994	724,108	766,222	808,336	850,450
Animal Waste Management Systems	Animal Units	1,061,846	1,140,000	1,250,000	1,450,000	1,700,000	1,975,000	2,320,984
Grass Buffers	Acres	12,363	18,547	24,731	30,915	37,099	43,283	49,467
Forest Buffers	Acres	9,780	20,380	30,980	41,579	52,179	62,779	73,378
Forest Buffers, Streamside Exclusion Fencing	Acres	9	3,494	6,979	10,464	13,949	17,435	20,920
<i>Best Management Practices (10-fold Increase)</i>								
Grass Buffers, Streamside Exclusion Fencing	Acres	390	2,004	3,618	5,232	6,846	8,460	10,074
Prescribed/Rotational Grazing	Acres	28,603	51,922	75,242	98,561	121,881	145,200	168,520
Manure Incorporation/Injection	Acres	-	5,000	10,000	15,000	20,000	25,000	30,000
Urban Stream Restoration	Linear Feet	2,153	102,843	203,534	304,224	404,914	505,605	606,295
Urban Nutrient Management	Acres	-	-	10,000	61,907	82,543	103,179	123,815
Bioswales	Acres Treated	-	1,010	2,021	3,031	4,042	5,052	6,063
Grey Infrastructure (IDDE)	Acres Treated	-	12,442	24,883	37,325	49,767	62,209	74,650
<i>Best Management Practices (PA Highlighted)</i>								
Runoff Reduction (RR) Performance Standard	Acres Treated	68,232	74,048	79,863	85,678	91,494	97,309	103,125
Conservation Tillage	Acres	381,936	378,455	374,974	371,493	368,012	364,531	361,050
Wetland Restoration	Acres	1,553	2,156	2,759	3,361	3,964	4,567	5,170
Non-Urban Stream Restoration	Linear Feet	500,414	567,310	634,206	701,102	767,998	834,894	901,790
PA Land Conservation Policy	Acres	-	3,333	6,667	10,000	13,333	16,667	20,000

Nutrient Management - Core Nitrogen



Nutrient Management, Core Nitrogen is a high-priority BMP and is included in the “Agricultural Compliance” category in the Phase 3 WIP. This practice includes implementation of Pennsylvania’s Act 38 Nutrient Management Program requirements and Chapter 91 Manure Management regulations. Since the 2017 Nutrient Management BMP Expert Panel Report, the acres reported is increasing due to the inclusion of Pennsylvania’s Chapter 91 Manure Management requirements. Pennsylvania’s Manure Management Manual (361-0300-002) provides guidance on nutrient application, manure storage, environmentally sensitive areas and setbacks from those areas, pasture management and minimizing nutrient runoff from Animal Concentration Areas (ACAs).

Linkage to Programmatic Milestones:

2.2.1A Investigate the incorporation of alternative manure treatment technologies and other potential strategies to address areas of excess manure nutrient generation and capital investment required for implementation of manure treatment systems.

- 2.2.1A(i) Prioritize and/or incentivize increased manure transport and manure transport tracking in counties, such as Lancaster County, that have been identified through CBPO Modeling Tools to be in excess of organic nutrients.
- 2.3.1A Initiate Implementation of Pennsylvania's Agriculture Conservation Stewardship Program.
- 2.3.2A Work with third-parties, integrators, and co-ops to identify alternative methods to support and assess compliance with regulations without use of regulatory entities.
- 2.3.4A Develop web-based and in-person training for Manure Management Planning and Agriculture Erosion and Sediment Control Planning.
- 2.3.5A Focus agricultural technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
- 2.4.3A Expand reporting of Enhanced Nutrient Management.
- 2.4.4 Continue enhancements to PracticeKeeper to capture agricultural and other source sector BMPs as well as compliance and inspection tracking and reporting.
- 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.1 Pass the Fertilizer Bill to achieve the identified nutrient reductions on urban and agricultural lands.
- 2.5.1A Implement NPDES Concentrated Animal Feeding Operation (CAFO) Program Delegation.
- 2.5.2 Review, consider and potentially incorporate a revised Phosphorus Index into the planning requirements for land application of biosolids.
- 2.5.2A Complete complaint follow-up for CAFO and non-CAFO facilities.
- 2.5.3 Develop State Agency nutrient reduction planning goals and the associated Action Plans for meeting those planning goals for the installation of practices on lands owned and maintained by state agencies.
- 2.5.3A Implement Chesapeake Bay Agriculture Inspection Program, Phase 1, with an emphasis on meeting state planning requirement on non-CAFO operations.

2.5.4A Implement Chesapeake Bay Agriculture Inspection Program, Phase 2, with an emphasis on meeting both state planning and implementation requirements on non-CAFO operations.

2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.

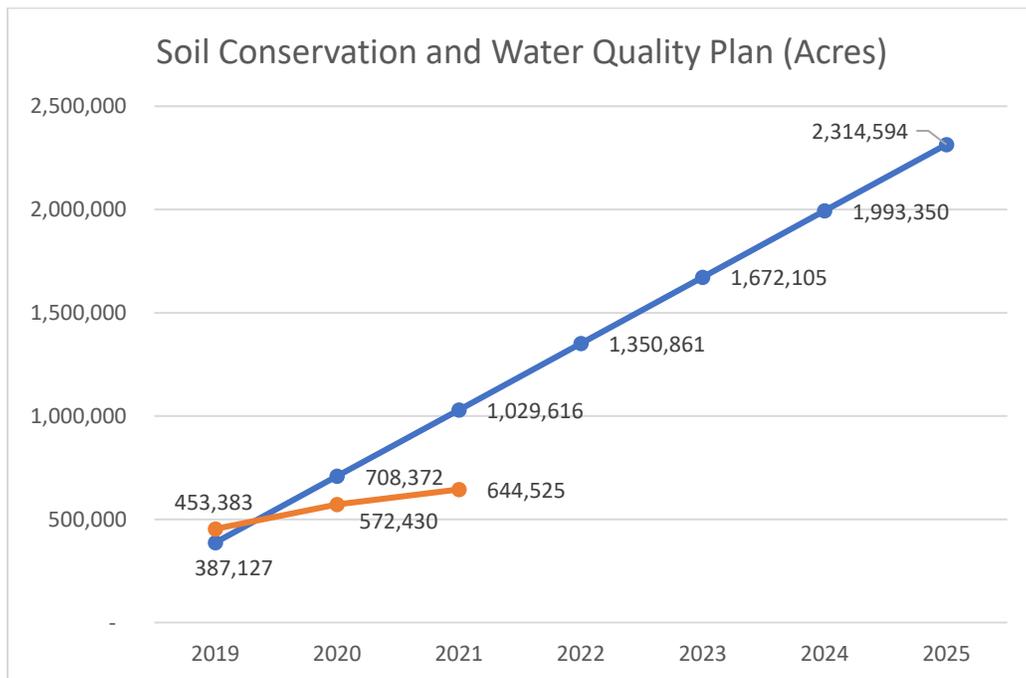
2.5.5A Participate in EPA’s formal assessment of Pennsylvania’s Animal Agriculture Programs.

3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.

3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.

3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Soil Conservation and Water Quality Plans



Soil Conservation and Water Quality Plans is a high-priority BMP and is included in the “Agricultural Compliance” category in the Phase 3 WIP. This practice includes official NRCS Conservation Plan acres and other field practices such as contour farming, conservation crop rotation, terraces and diversions that map to this practice.

Pennsylvania's Soil Erosion and Sediment Control Manual for Agricultural Operations (383-4200-002) provides guidance on conservation crop rotations, tillage management, as well as other management and structural BMPs that can be implemented in order to minimize accelerated erosion and sedimentation on agricultural lands in order to meet the erosion and sediment control requirements. In addition to NRCS Conservation Plans, Pennsylvania has also begun tracking and reporting the development and implementation of Agricultural Erosion and Sediment Control (Ag E&S) Plans.

Linkage to Programmatic Milestones:

- 2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.
- 2.3.1A Initiate Implementation of Pennsylvania's Agriculture Conservation Stewardship Program.
- 2.3.2A Work with third-parties, integrators, and co-ops to identify alternative methods to support and assess compliance with regulations without use of regulatory entities.
- 2.3.4A Develop web-based and in-person training for Manure Management Planning and Agriculture Erosion and Sediment Control Planning.
- 2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
- 2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.
- 2.4.3 Work with the Chesapeake Bay Program Partnership, Water Quality Goal Implementation Team, to elicit support for a joint remote sensing project with other jurisdictions.
- 2.4.4 Continue enhancements to PracticeKeeper to capture agricultural and other source sector BMPs as well as compliance and inspection tracking and reporting.
- 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.1A Implement NPDES Concentrated Animal Feeding Operation (CAFO) Program Delegation.
- 2.5.2A Complete complaint follow-up for CAFO and non-CAFO facilities.

2.5.3A Implement Chesapeake Bay Agriculture Inspection Program, Phase 1, with an emphasis on meeting state planning requirement on non-CAFO operations.

2.5.4A Implement Chesapeake Bay Agriculture Inspection Program, Phase 2, with an emphasis on meeting both state planning and implementation requirements on non-CAFO operations.

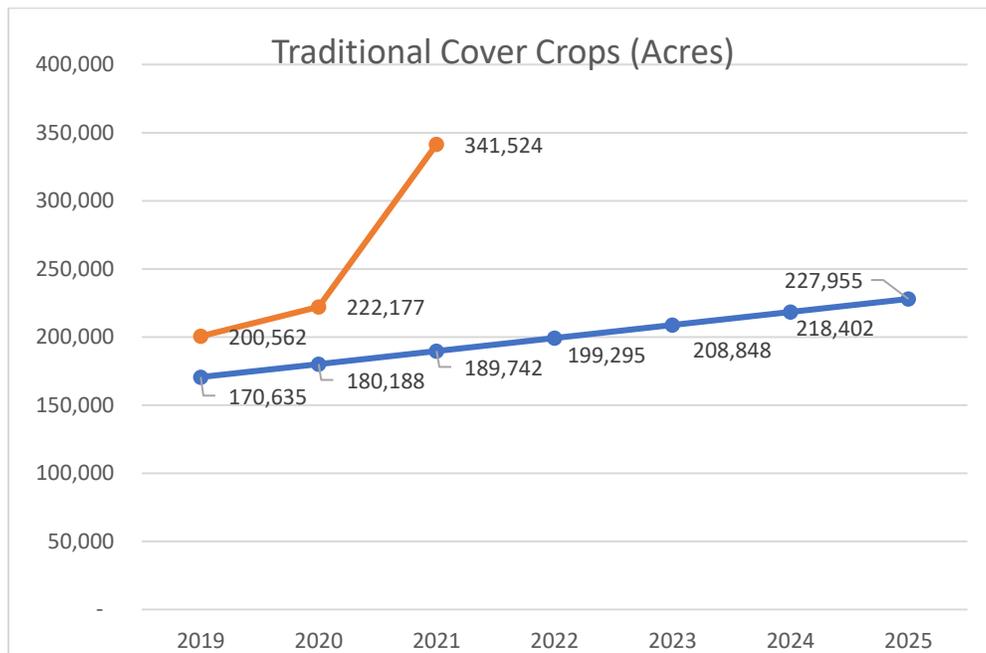
2.5.5A Participate in EPA’s formal assessment of Pennsylvania’s Animal Agriculture Programs.

3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.

3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.

3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Traditional Cover Crops



Traditional Cover Crops (which are not harvested) is a high-priority BMP and is included in the “Soil Health” category in the Phase 3 WIP. This practice is currently collected through the annual Transect Surveys and is considered an annual visual practice. The resulting percentage of covered observations are extrapolated to the county row crop acres based on USDA - NASS annual crop acreages provided by the Bay Program. To

date, through the Transect Survey effort, field staff are documenting a greater frequency of Traditional Cover Crops than the milestone target, which may indicate a lower propensity to plant Traditional Cover Crops With Fall Nutrients applied, shown below.

Linkage to Programmatic Milestones:

2.1.2A Continue communication, outreach and stewardship programs to increase implementation of cover crops.

2.3.1A Initiate Implementation of Pennsylvania's Agriculture Conservation Stewardship Program.

2.3.2A Work with third-parties, integrators, and co-ops to identify alternative methods to support and assess compliance with regulations without use of regulatory entities.

2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.

2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.

2.4.1A Work with the Chesapeake Bay Program Partnership to establish a creditable practice or combination of practices for implementation of advanced soil health strategies or plans on farms in the Chesapeake Bay Watershed Model for future crediting of these initiatives. Once established as a practice or set of practices that can be credited for progress in the model, commit additional funding or the technical and financial assistance necessary to implement these practices.

2.4.3 Work with the Chesapeake Bay Program Partnership, Water Quality Goal Implementation Team, to elicit support for a joint remote sensing project with other jurisdictions.

2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.

2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.

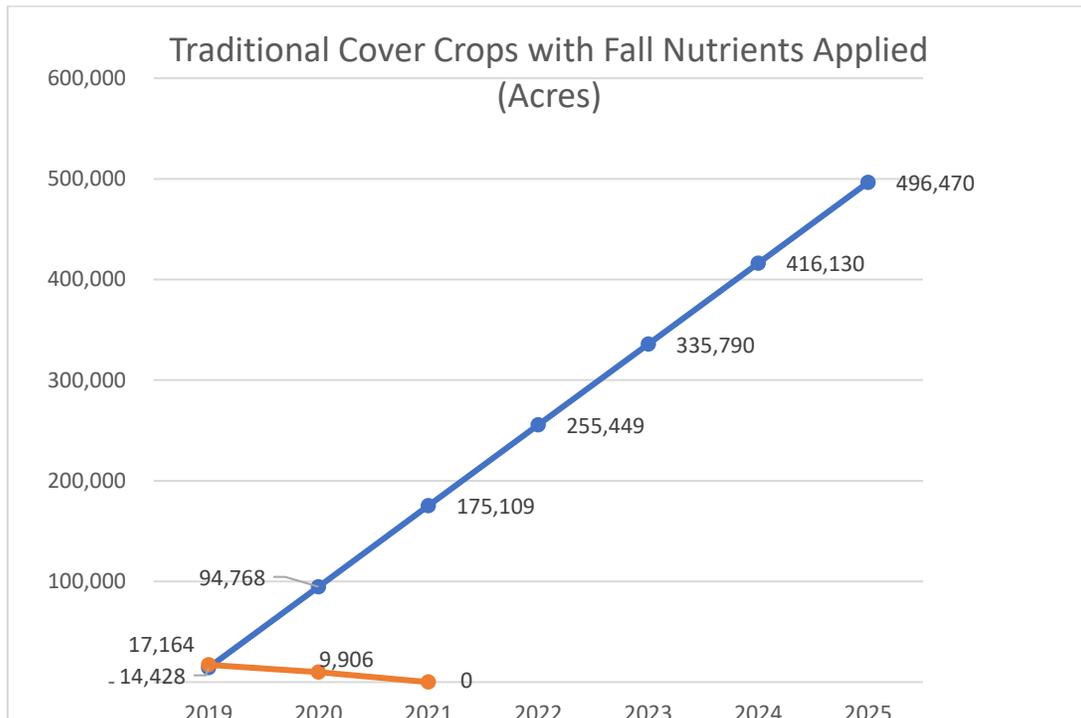
2.5.5A Participate in EPA's formal assessment of Pennsylvania's Animal Agriculture Programs.

3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.

3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.

3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Traditional Cover Crops with Fall Nutrients Applied



Traditional Cover Crops with fall nutrients applied (not harvested) is a high-priority BMP and is included in the “Soil Health” category in the Phase 3 WIP. This practice is currently collected through the annual Transect Surveys along with Traditional Cover Crops (see above). The resulting percentage of covered observations are extrapolated to the county row crop acres based on USDA - NASS annual crop acreages provided by the Bay Program. To date, through the Transect Survey effort, field staff are documenting a greater frequency of Traditional Cover Crops than the milestone target as shown above, which may indicate a lower propensity to plant Traditional Cover Crops With Fall Nutrients applied.

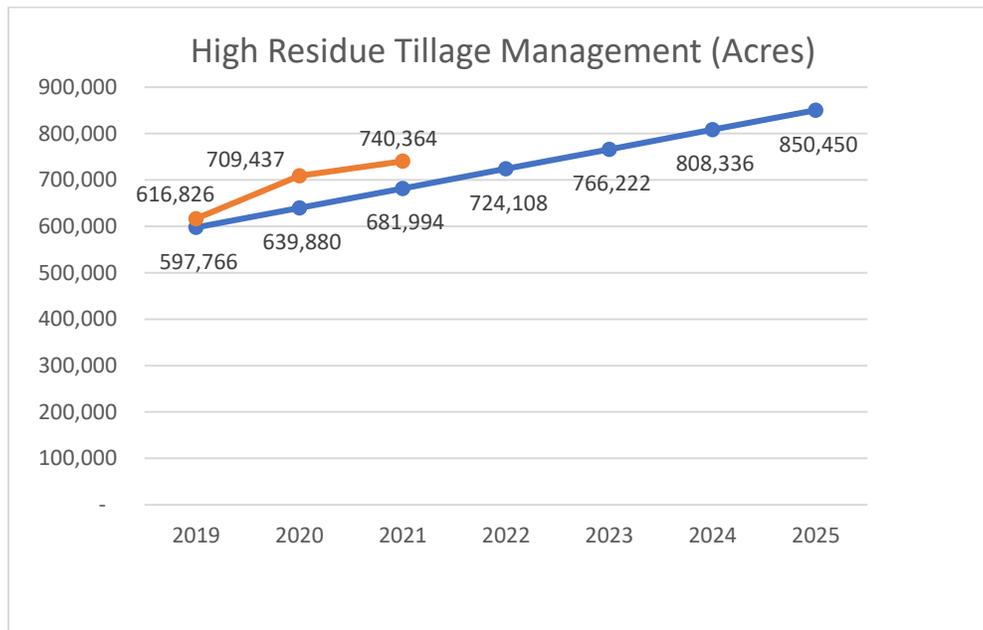
Linkage to Programmatic Milestones:

2.1.2A Continue communication, outreach and stewardship programs to increase implementation of cover crops.

2.3.1A Initiate Implementation of Pennsylvania’s Agriculture Conservation Stewardship Program.

- 2.3.2A Work with third-parties, integrators, and co-ops to identify alternative methods to support and assess compliance with regulations without use of regulatory entities.
- 2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
- 2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.
- 2.4.1A Work with the Chesapeake Bay Program Partnership to establish a creditable practice or combination of practices for implementation of advanced soil health strategies or plans on farms in the Chesapeake Bay Watershed Model for future crediting of these initiatives. Once established as a practice or set of practices that can be credited for progress in the model, commit additional funding or the technical and financial assistance necessary to implement these practices.
- 2.4.3 Work with the Chesapeake Bay Program Partnership, Water Quality Goal Implementation Team, to elicit support for a joint remote sensing project with other jurisdictions.
- 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.5A Participate in EPA's formal assessment of Pennsylvania's Animal Agriculture Programs.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

High Residue Tillage Management (>60% Residue)



High Residue Tillage Management is a high-priority BMP and is included in the “Soil Health” category in the Phase 3 WIP. This practice includes row crop field acres with greater than 60% growing or residue cover. This practice is commonly referred to as “no-till.” This data is currently collected through Pennsylvania’s annual Transect Survey conducted by Capital RC&D. The resulting percentage of covered observations are extrapolated to the county row crop acres based on USDA - NASS annual crop acreages provided by the Bay Program. As High Residue Tillage Management acres increase, Conservation Tillage acres will decrease.

Linkage to Programmatic Milestones:

2.1.1A Continue communication, outreach and stewardship programs to increase the use of conservation tillage and no-till practices.

2.3.1A Initiate Implementation of Pennsylvania’s Agriculture Conservation Stewardship Program.

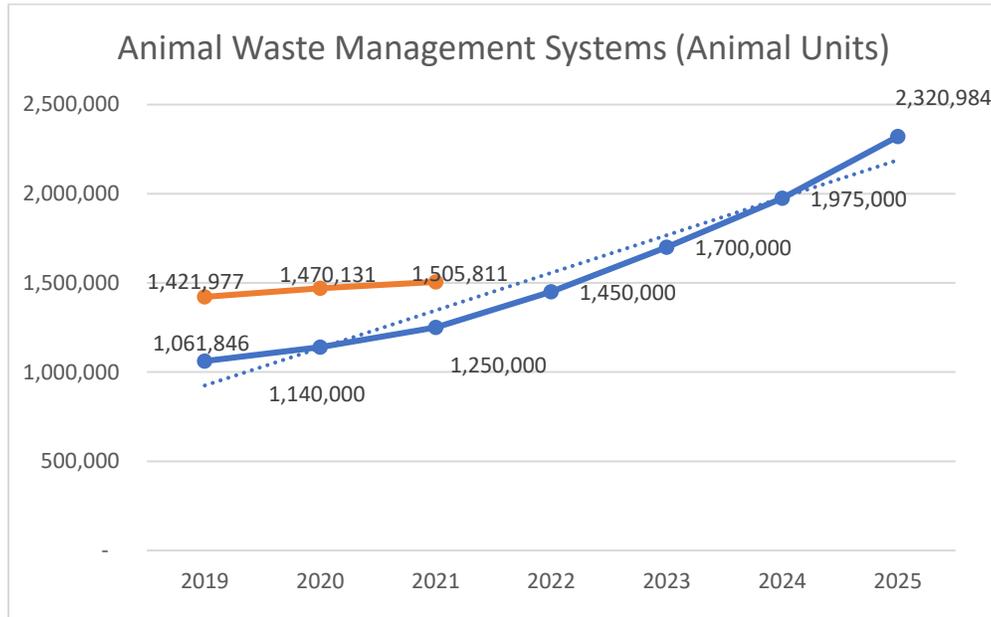
2.3.2A Work with third-parties, integrators, and co-ops to identify alternative methods to support and assess compliance with regulations without use of regulatory entities.

2.3.4A Develop web-based and in-person training for Manure Management Planning and Agriculture Erosion and Sediment Control Planning.

2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.

- 2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.
- 2.4.1A Work with the Chesapeake Bay Program Partnership to establish a creditable practice or combination of practices for implementation of advanced soil health strategies or plans on farms in the Chesapeake Bay Watershed Model for future crediting of these initiatives. Once established as a practice or set of practices that can be credited for progress in the model, commit additional funding or the technical and financial assistance necessary to implement these practices.
- 2.4.3 Work with the Chesapeake Bay Program Partnership, Water Quality Goal Implementation Team, to elicit support for a joint remote sensing project with other jurisdictions.
- 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.5A Participate in EPA's formal assessment of Pennsylvania's Animal Agriculture Programs.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Animal Waste Management Systems (AWMS)



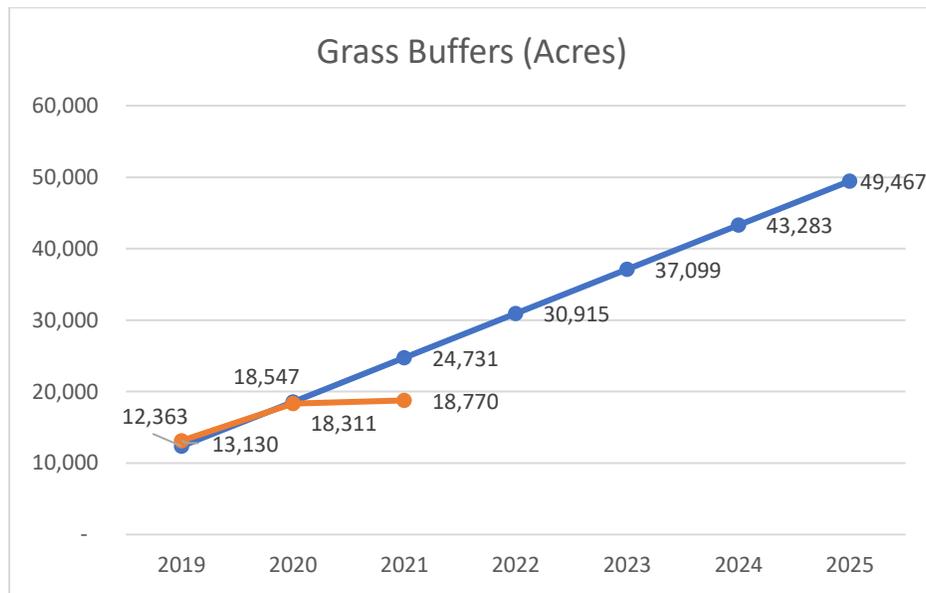
Livestock and Poultry AWMS are reported in Animal Units (AU). One AU equals 1,000 pounds of animal weight. Pennsylvania projected non-linear growth for this practice due to added lead time for implementation due to the need for required design, review, potential permitting (if earth disturbance is equal to or greater than one acre), and construction of these systems.

Linkage to Programmatic Milestones:

- 2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.
- 2.3.1A Initiate Implementation of Pennsylvania's Agriculture Conservation Stewardship Program.
- 2.3.2A Work with third-parties, integrators, and co-ops to identify alternative methods to support and assess compliance with regulations without use of regulatory entities.
- 2.3.3A Implementation of Animal Waste Management Systems.
- 2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
- 2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.

- 2.4.3 Work with the Chesapeake Bay Program Partnership, Water Quality Goal Implementation Team, to elicit support for a joint remote sensing project with other jurisdictions.
- 2.4.4 Continue enhancements to PracticeKeeper to capture agricultural and other source sector BMPs as well as compliance and inspection tracking and reporting.
- 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.1A Implement NPDES Concentrated Animal Feeding Operation (CAFO) Program Delegation.
- 2.5.2A Complete complaint follow-up for CAFO and non-CAFO facilities.
- 2.5.3A Implement Chesapeake Bay Agriculture Inspection Program, Phase 1, with an emphasis on meeting state planning requirement on non-CAFO operations.
- 2.5.4A Implement Chesapeake Bay Agriculture Inspection Program, Phase 2, with an emphasis on meeting both state planning and implementation requirements on non-CAFO operations.
- 2.5.5A Participate in EPA's formal assessment of Pennsylvania's Animal Agriculture Programs.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Grass Buffers



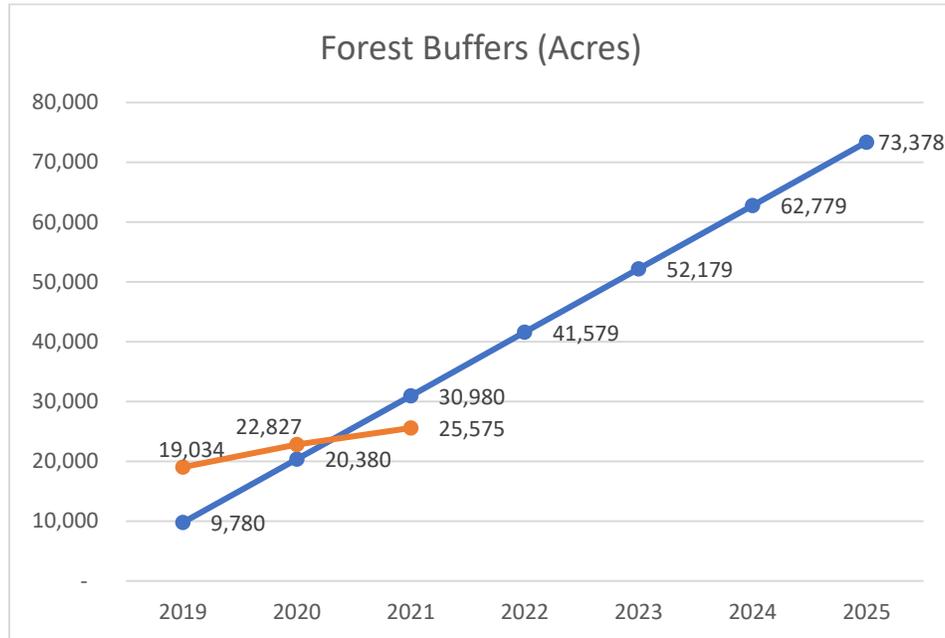
Grass Buffers is a high-priority BMP. This practice provides stabilization and nutrient uptake adjacent to fields and other areas where trees are not planted. Grass Buffers also undergo “back out” of the model due to land use mapping, which may also reduce the cumulatively tracked management actions and reductions associated with those actions in modeled progress. More than 12,200 acres reported through 2017 had undergone “back out.” Grass Buffers with streamside exclusion fencing is provided separately in this milestone report.

Linkage to Programmatic Milestones:

- 2.3.2A Work with third-parties, integrators, and co-ops to identify alternative methods to support and assess compliance with regulations without use of regulatory entities.
- 2.3.4A Develop web-based and in-person training for Manure Management Planning and Agriculture Erosion and Sediment Control Planning.
- 2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
- 2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.

- 2.4.3 Work with the Chesapeake Bay Program Partnership, Water Quality Goal Implementation Team, to elicit support for a joint remote sensing project with other jurisdictions.
- 2.4.4 Continue enhancements to PracticeKeeper to capture agricultural and other source sector BMPs as well as compliance and inspection tracking and reporting.
 - 2.4.4A Expand reporting of grass buffers.
 - 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.1A Implement NPDES Concentrated Animal Feeding Operation (CAFO) Program Delegation.
- 2.5.2A Complete complaint follow-up for CAFO and non-CAFO facilities.
- 2.5.3A Implement Chesapeake Bay Agriculture Inspection Program, Phase 1, with an emphasis on meeting state planning requirement on non-CAFO operations.
- 2.5.4A Implement Chesapeake Bay Agriculture Inspection Program, Phase 2, with an emphasis on meeting both state planning and implementation requirements on non-CAFO operations.
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- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Forest Buffers



Forest Buffers is a high-priority BMP. Additional implementation funding and transition to updated aerial imagery capture will help improve reporting for this BMP. This BMP will be implemented through cost-share and other focused implementation efforts. Forest Buffers also undergo “back out” of the model due to land use mapping, which may also reduce the cumulatively tracked management actions and reductions associated with those actions in modeled progress. More than 8,000 acres reported through 2017 had undergone “back out.” Forest Buffers with streamside exclusion fencing is provided separately in this milestone report.

Linkage to Programmatic Milestones:

2.1.1F Implement a comprehensive communication/outreach strategy to engage farmers/landowners in planting and maintaining riparian forest buffers.

2.2.1F Maximize existing funding sources for riparian forest buffer implementation in Pennsylvania.

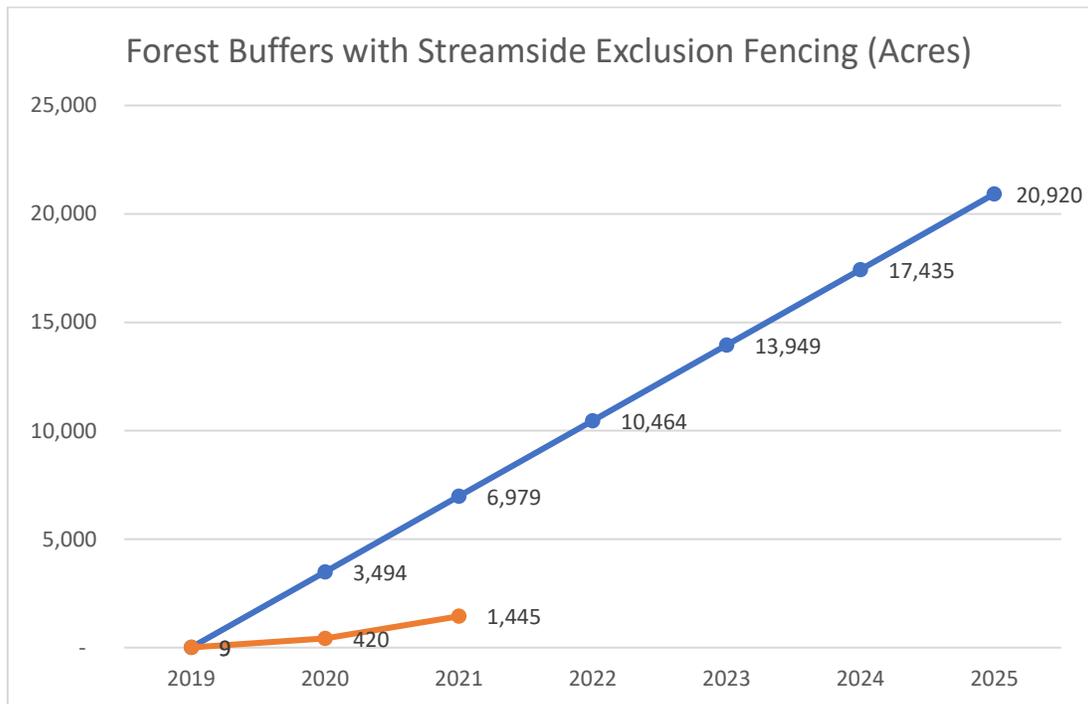
2.2.3F Create additional, flexible funding options for riparian forest buffers.

2.2.4F Ensure that riparian forest buffers are adequately maintained to ensure survival by developing a Maintenance funding source for NGOs to develop their own maintenance programs.

2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.

- 2.3.1F Increase technical assistance available to landowners interested in implementing riparian forest buffers.
- 2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
- 2.4.1F Ensure adequate tracking of partner-implemented forestry BMPs including forest buffers, tree canopy, conservation landscaping, urban forest expansion, stream wetland restoration.
- 2.4.2F Celebrate successful implementation and maintenance of forestry BMPs through reporting successful efforts.
- 2.4.3 Work with the Chesapeake Bay Program Partnership, Water Quality Goal Implementation Team, to elicit support for a joint remote sensing project with other jurisdictions.
- 2.4.4 Continue enhancements to PracticeKeeper to capture agricultural and other source sector BMPs as well as compliance and inspection tracking and reporting.
- 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Forest Buffers with Streamside Exclusion Fencing



Forest Buffers with streamside exclusion fencing is a high-priority BMP. Improved tracking and identification from reporting data sources is required; the typical data sources have generally reported the forest buffer BMP and the fence BMP separately, so no connection could be made with viable accuracy. PracticeKeeper will be used to better identify this BMP but grant recipients and data reporters will need to identify streambank fencing in addition to the Forest Buffer implementation on a site-by-site basis. Aerial imagery may be of value to identify forest buffer implementation on pasture. Due to the push for identification of streamside exclusion fencing in conjunction with forest buffers, there may be a switch from reporting under “Forest Buffers” to “Forest Buffers with Streamside Exclusion Fencing” in the past few years and moving forward, which more accurately reflects on-the-ground management actions.

Linkage to Programmatic Milestones:

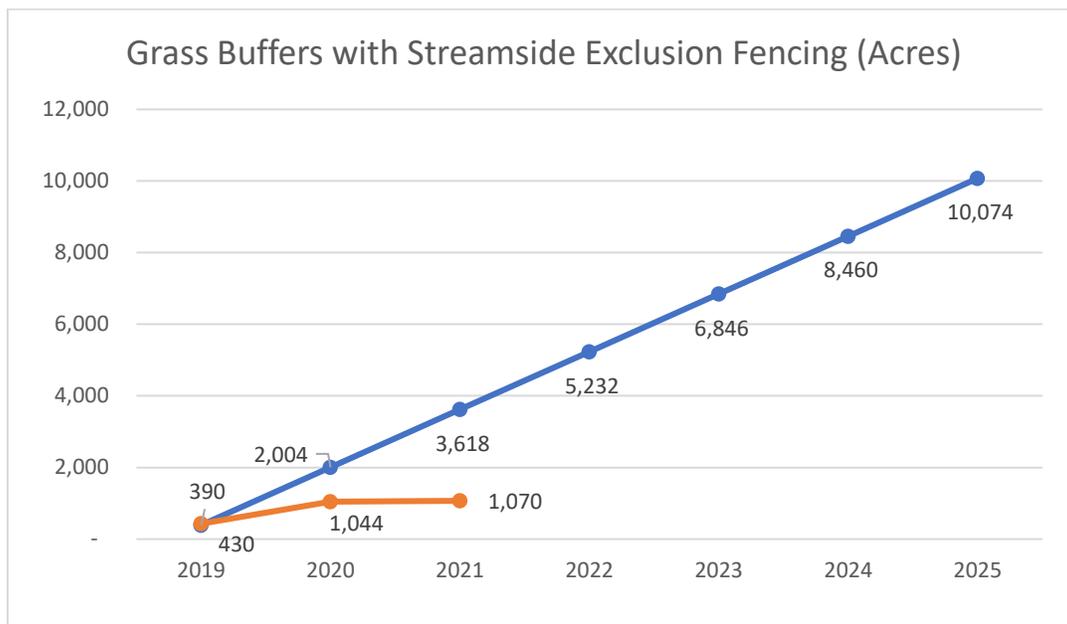
2.1.1F Implement a comprehensive communication/outreach strategy to engage farmers/landowners in planting and maintaining riparian forest buffers.

2.1.3A Continue communication, outreach and stewardship programs to increase implementation of pasture management.

2.2.1F Maximize existing funding sources for riparian forest buffer implementation in Pennsylvania.

- 2.2.3F Create additional, flexible funding options for riparian forest buffers.
- 2.2.4F Ensure that riparian forest buffers are adequately maintained to ensure survival by developing a Maintenance funding source for NGOs to develop their own maintenance programs.
- 2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.
- 2.3.1F Increase technical assistance available to landowners interested in implementing riparian forest buffers.
- 2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
- 2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.
- 2.4.1F Ensure adequate tracking of partner-implemented forestry BMPs including forest buffers, tree canopy, conservation landscaping, urban forest expansion, stream wetland restoration.
- 2.4.2F Celebrate successful implementation and maintenance of forestry BMPs through reporting successful efforts.
- 2.4.3 Work with the Chesapeake Bay Program Partnership, Water Quality Goal Implementation Team, to elicit support for a joint remote sensing project with other jurisdictions.
- 2.4.4 Continue enhancements to PracticeKeeper to capture agricultural and other source sector BMPs as well as compliance and inspection tracking and reporting.
- 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Grass Buffers with Streamside Exclusion Fencing



Grass Buffers with streamside exclusion fencing is a high-priority BMP. Improved tracking and identification from reporting data sources is required; the typical data sources have generally reported the grass buffer BMP and the fence BMP separately, so no connection could be made with viable accuracy. Grass Buffers also undergo “back out” of the model due to land use mapping, which may also reduce the cumulatively tracked management actions. Additionally, grass buffers are usually implemented as non-cost share. PracticeKeeper will be used to better identify this BMP but data reporters will need to identify streambank fencing in addition to the Grass Buffer implementation on a site-by-site basis. Aerial imagery may be of value to identify grass buffer implementation on pasture. Due to the push for identification of streamside exclusion fencing in conjunction with forest buffers, there may be a switch from reporting under “Grass Buffers” to “Grass Buffers with Streamside Exclusion Fencing” in the past few years and moving forward, which more accurately reflects on-the-ground management actions.

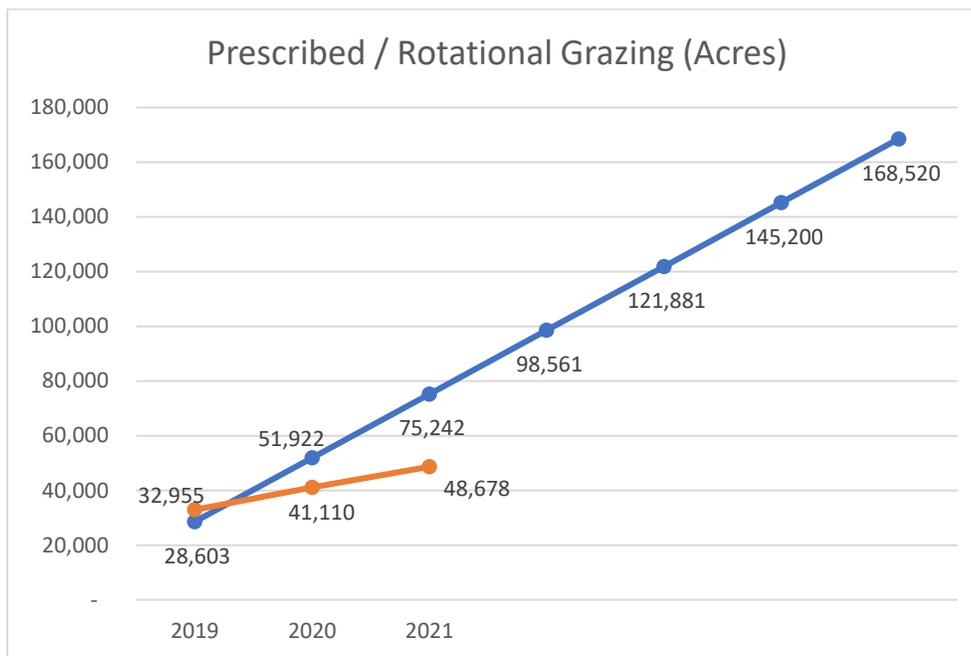
Linkage to Programmatic Milestones:

2.1.3A Continue communication, outreach and stewardship programs to increase implementation of pasture management.

2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.

- 2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
- 2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.
- 2.4.3 Work with the Chesapeake Bay Program Partnership, Water Quality Goal Implementation Team, to elicit support for a joint remote sensing project with other jurisdictions.
- 2.4.4 Continue enhancements to PracticeKeeper to capture agricultural and other source sector BMPs as well as compliance and inspection tracking and reporting.
 - 2.4.4A Expand reporting of grass buffers.
 - 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.1A Implement NPDES Concentrated Animal Feeding Operation (CAFO) Program Delegation.
 - 2.5.2A Complete complaint follow-up for CAFO and non-CAFO facilities.
 - 2.5.3A Implement Chesapeake Bay Agriculture Inspection Program, Phase 1, with an emphasis on meeting state planning requirement on non-CAFO operations.
 - 2.5.4A Implement Chesapeake Bay Agriculture Inspection Program, Phase 2, with an emphasis on meeting both state planning and implementation requirements on non-CAFO operations.
 - 2.5.5A Participate in EPA's formal assessment of Pennsylvania's Animal Agriculture Programs.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Prescribed / Rotational Grazing



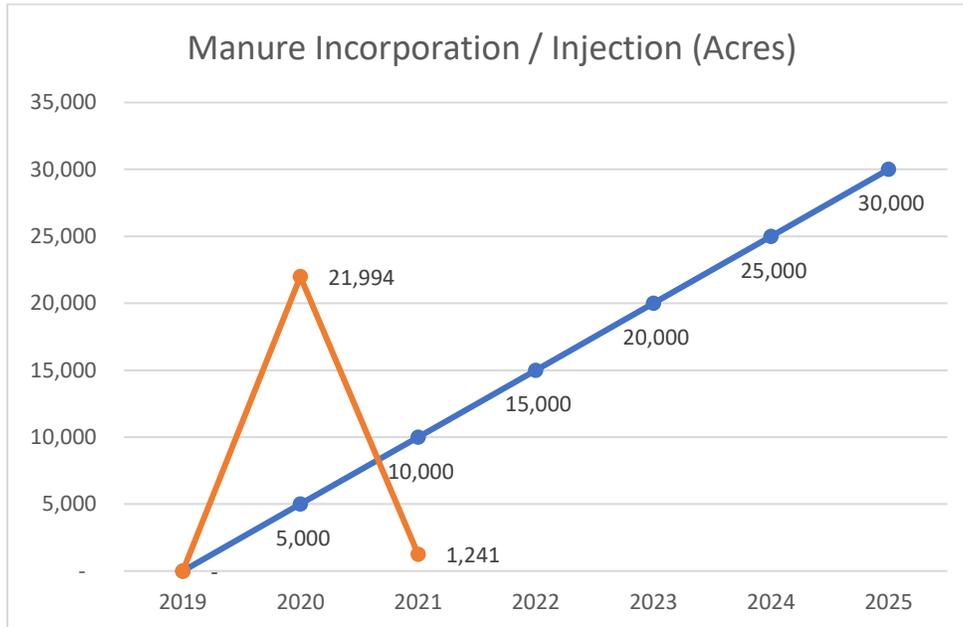
Prescribed (or rotational) grazing is a pasture management system that optimizes soil and pasture health by limiting overgrazing of pastures. This BMP has primarily been reported through NRCS cost-share implementation, although the capability to more completely report this practice has been developed through and is currently being tracked and reported in PracticeKeeper. Pennsylvania's Manure Management Manual (361-0300-002) and Soil Erosion and Sediment Control Manual for Agriculture (383-4200-002) provides guidance on pasture management and minimizing nutrient and sediment runoff from Animal Concentration Areas/Animal Heavy Use Areas (ACA/AHUA). Prescribed/Rotational Grazing is also part of the Resource Improvement (RI) practice suite.

Linkage to Programmatic Milestones:

- 2.1.3A Continue communication, outreach and stewardship programs to increase implementation of pasture management.
- 2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.
- 2.3.1A Initiate Implementation of Pennsylvania's Agriculture Conservation Stewardship Program.
- 2.3.2A Work with third-parties, integrators, and co-ops to identify alternative methods to support and assess compliance with regulations without use of regulatory entities.

- 2.3.4A Develop web-based and in-person training for Manure Management Planning and Agriculture Erosion and Sediment Control Planning.
- 2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
- 2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.
- 2.4.4 Continue enhancements to PracticeKeeper to capture agricultural and other source sector BMPs as well as compliance and inspection tracking and reporting.
- 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.1A Implement NPDES Concentrated Animal Feeding Operation (CAFO) Program Delegation.
- 2.5.3A Implement Chesapeake Bay Agriculture Inspection Program, Phase 1, with an emphasis on meeting state planning requirement on non-CAFO operations.
- 2.5.4A Implement Chesapeake Bay Agriculture Inspection Program, Phase 2, with an emphasis on meeting both state planning and implementation requirements on non-CAFO operations.
- 2.5.5A Participate in EPA's formal assessment of Pennsylvania's Animal Agriculture Programs.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Manure Incorporation / Injection



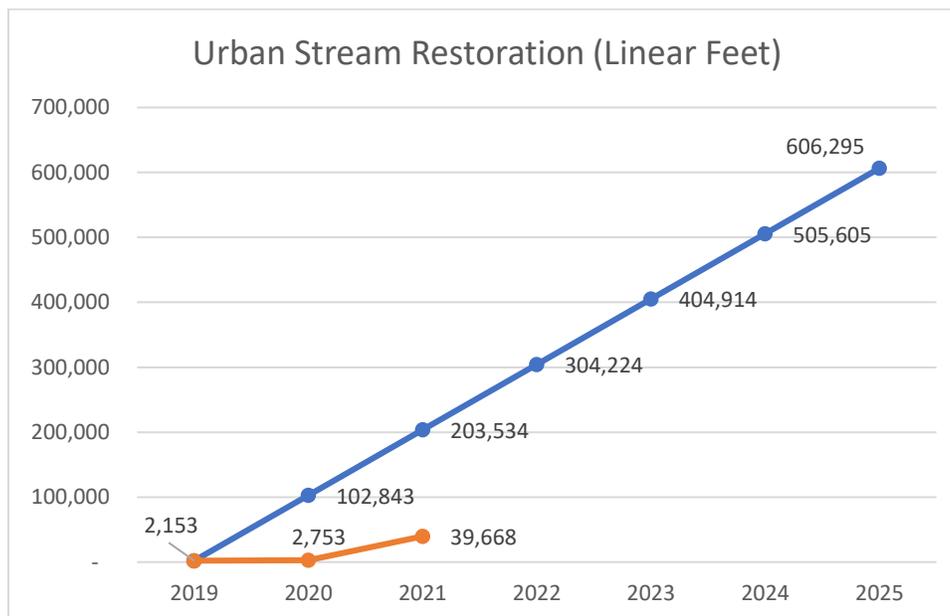
Manure Incorporation/Injection minimizes field nutrient losses to volatilization and improves delivery of nutrients to crops. It is important to note that with increased implementation rates of High Residue Management, manure incorporation should decrease. In 2020, Manure Incorporation was reported from the Penn State Voluntary Producer Survey. Since this practice is reported on an annual basis, it requires a consistent data source. DEP is working with EPA Chesapeake Bay Program Office to determine how to flatten out the trend line based on data source availability, rather than view annual increases and decreases. Manure injection has also been piloted throughout the southern part of Pennsylvania's watershed and shows positive results. Additionally, a manure injector for use by Plain Sect farmers was built and is being provided through grant funding in Lancaster County.

Linkage to Programmatic Milestones:

- 2.3.1A Initiate Implementation of Pennsylvania's Agriculture Conservation Stewardship Program.
- 2.3.2A Work with third-parties, integrators, and co-ops to identify alternative methods to support and assess compliance with regulations without use of regulatory entities.
- 2.3.4A Develop web-based and in-person training for Manure Management Planning and Agriculture Erosion and Sediment Control Planning.

- 2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.
- 2.4.3A Expand reporting of Enhanced Nutrient Management.
- 2.4.4 Continue enhancements to PracticeKeeper to capture agricultural and other source sector BMPs as well as compliance and inspection tracking and reporting.
- 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.1A Implement NPDES Concentrated Animal Feeding Operation (CAFO) Program Delegation.
- 2.5.3A Implement Chesapeake Bay Agriculture Inspection Program, Phase 1, with an emphasis on meeting state planning requirement on non-CAFO operations.
- 2.5.4A Implement Chesapeake Bay Agriculture Inspection Program, Phase 2, with an emphasis on meeting both state planning and implementation requirements on non-CAFO operations.
- 2.5.5A Participate in EPA's formal assessment of Pennsylvania's Animal Agriculture Programs.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Urban Stream Restoration



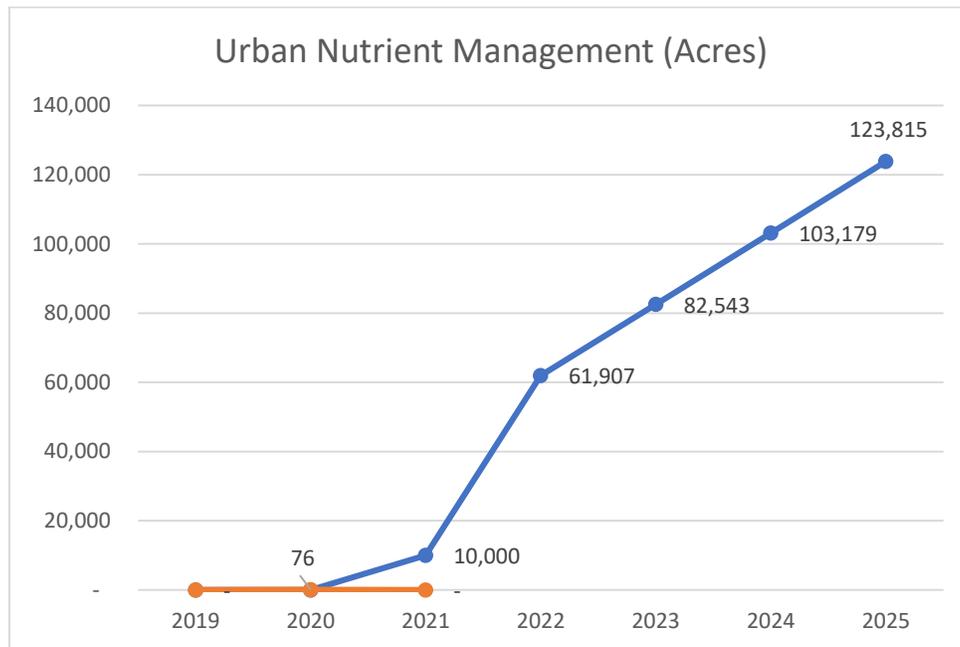
Stream Restoration projects are often not well attributed to urban environments; most projects are located within non-urban settings. Additional future reporting of Urban Stream Restoration is expected to be predominantly collected from Municipal Separate Storm Sewer System (MS4) Permittees' implementation of their Pollutant Reduction Plans (PRPs)/Total Maximum Daily Load (TMDL) Plans and from counties implementing their CAPs. The DEP Growing Greener Plus grant program was adjusted in 2021 to provide additional preference toward flood resiliency projects, including urban stream restoration projects. The 2021 EPA Most Effective Basin funding for Environmental Justice (EJ) areas was allocated to a large-scale, multi-year urban stream, floodplain, and wetland restoration project in a Tier 1 county.

Linkage to Programmatic Milestones:

- 2.1.4F Emphasize the full range of benefits & co-benefits of stream and wetland restoration to facilitate additional implementation.
- 2.2.6F Leverage existing funding sources for Stream and Wetland Restoration.
- 2.2.8F 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 from legacy sediment removal and associated ecosystem restoration.
- 2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.

- 2.3.4F Provide informed technical assistance for stream and wetland restoration projects to ensure they are completed in an adequate, reportable manner.
- 2.3.5F Expand the Pennsylvania Fish and 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 pilot counties to include Adams, Franklin, Lancaster and York.
- 2.4.1F Ensure adequate tracking of partner-implemented forestry BMPs including forest buffers, tree canopy, conservation landscaping, urban forest expansion, stream wetland restoration.
- 2.4.1S Collect Municipal Separate Storm Sewer System (MS4) BMP data using the new reporting systems for electronic submission for annual reports and inspections.
- 2.4.3S Continue to track MS4 PRP submission, review, and approval.
- 2.4.6 Work with EPA and the Chesapeake Bay Program Partnership to enhance the existing crediting protocols for programs and practices that improve water quality in Pennsylvania not currently getting full credit in the Chesapeake Bay Watershed Model.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.3S Continue to implement the NPDES Municipal Stormwater Program Delegation, to include permitting, compliance, inspection, and enforcement.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Urban Nutrient Management



Urban Nutrient Management uses the control of nutrient application on turf grass to reduce loads in the urban environment. This practice is not currently tracked or reported. It is expected that these acres will be reported through MS4 PRPs through the potential implementation from the proposed Fertilizer Application Bill. The initial milestone anticipated only partial reporting would be available by 2021, but it would be contingent on the proposed Fertilizer Application Bill.

Linkage to Programmatic Milestones:

- 2.4.1S Collect Municipal Separate Storm Sewer System (MS4) BMP data using the new reporting systems for electronic submission for annual reports and inspections.
- 2.4.3S Continue to track MS4 PRP submission, review, and approval.
- 2.4.10 Active participation and collaboration in Chesapeake Bay Partnership Technical Workgroups focused on CAST model updates.
- 2.5.1 Pass the Fertilizer Bill to achieve the identified nutrient reductions on urban and agriculture lands.
- 2.5.3 Develop State Agency nutrient reduction planning goals and the associated Action Plans for meeting those planning goals for the installation of practices on lands owned and maintained by state agencies.

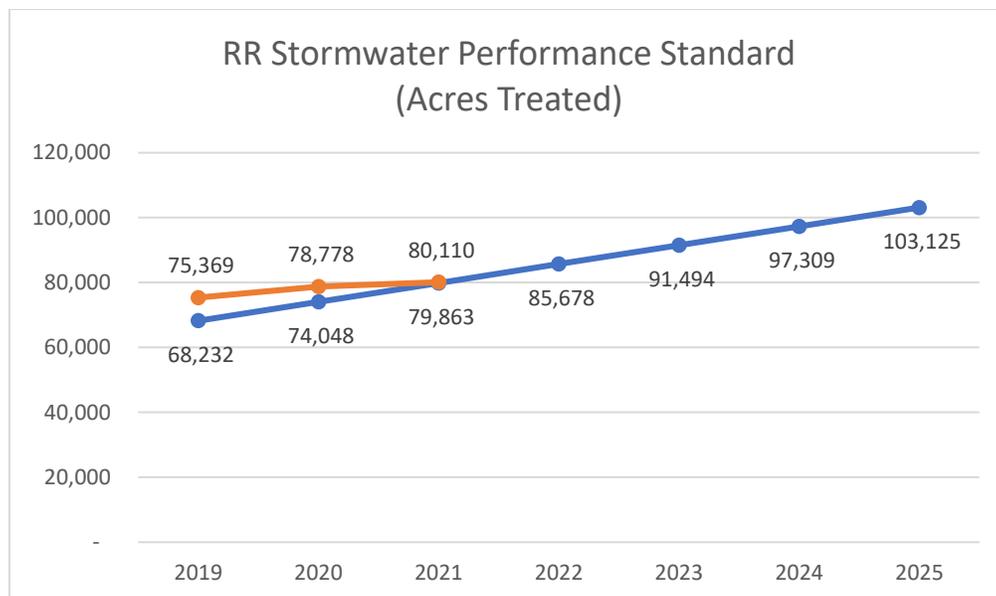
2.5.3S Continue to implement the NPDES Municipal Stormwater Program Delegation, to include permitting, compliance, inspection, and enforcement.

3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.

3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.

3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Runoff Reduction (RR) Performance Standard

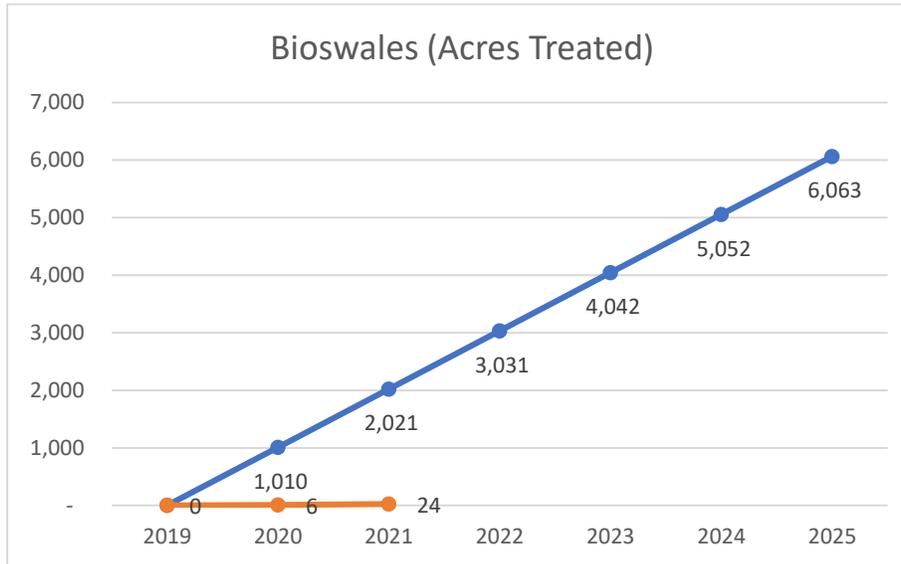


RR Performance Standards refers to a range of structural and non-structural measures installed over the entire development or re-development site to reduce runoff, flooding and downstream bank erosion, as well as improve water quality. These practices include a number of individual stormwater BMPs, also known as stormwater control measures (SCMs). These practices include: riparian buffer restoration, impervious disconnection, sheet flow to vegetated filter strip or open space, and non-structural BMPs from Pennsylvania’s BMP Manual. It also includes structural practices like bioretention and rain gardens, dry channel regenerative stormwater conveyance, dry swale, expanded tree pits, grass channels and bioswales, green roofs, green streets, infiltration practices, permeable pavement, and rainwater harvesting / capture and re-use.

Linkage to Programmatic Milestones:

- 2.1.1S Continue to engage with municipalities and others on the benefits of implementing and maintaining stormwater management practices through web-based trainings, in-person meetings, workshops, etc.
- 2.1.2S Provide more awareness of the expanded opportunities for BMP implementation in connection with the MS4 permit requirements.
- 2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.
- 2.3.1S Complete revisions to the Pennsylvania Stormwater BMP Manual.
- 2.4.1S Collect Municipal Separate Storm Sewer System (MS4) BMP data using the new reporting systems for electronic submission for annual reports and inspections.
- 2.4.2S Initiate and collect stormwater BMP data from other DEP programs implementing provisions of the Chapter 102 regulations, to include required post-construction stormwater management.
- 2.4.3S Continue to track MS4 PRP submission, review, and approval.
- 2.5.3S Continue to implement the NPDES Municipal Stormwater Program Delegation, to include permitting, compliance, inspection, and enforcement.
- 2.5.6S Continue to implement the NPDES Construction Stormwater Program Delegation, to include permitting, compliance, inspection, and enforcement.
- 2.5.7S Continue water quality demonstration requirements for post-construction stormwater management.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Bioswales



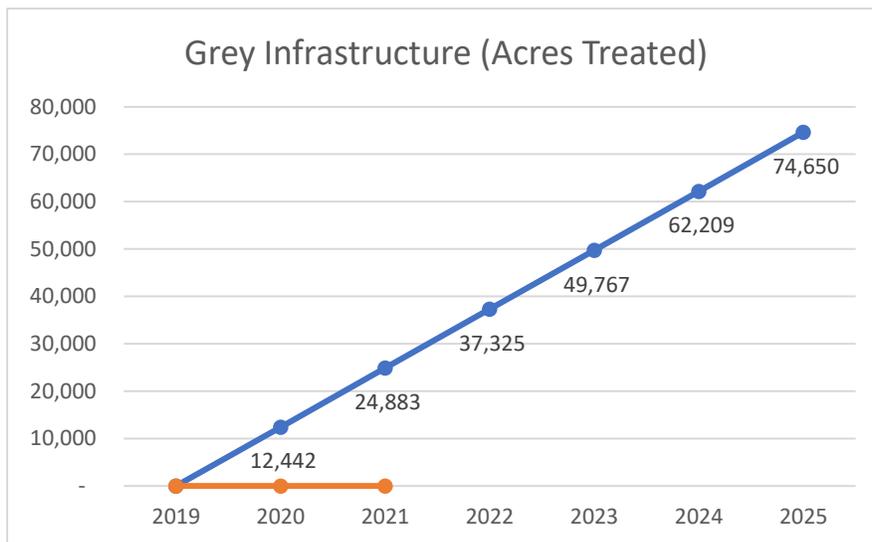
Bioswale installations can address and improve urban stormwater management. These BMPs are typically reported through post-construction stormwater permitting and cost-share programs. There is currently minimal reporting of this practice because it has been reported as part of the RR Performance Standard reporting to more completely capture stormwater management practices, particularly where used for required post-construction stormwater management. This reporting trend will likely continue; therefore it would be of value to focus on the RR Performance Standards rather than Bioswales as an individual practice.

Linkage to Programmatic Milestones:

- 2.1.1S Continue to engage with municipalities and others on the benefits of implementing and maintaining stormwater management practices through web-based trainings, in-person meetings, workshops, etc.
- 2.1.2S Provide more awareness of the expanded opportunities for BMP implementation in connection with the MS4 permit requirements.
- 2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.
- 2.3.1S Complete revisions to the Pennsylvania Stormwater BMP Manual.
- 2.4.1S Collect Municipal Separate Storm Sewer System (MS4) BMP data using the new reporting systems for electronic submission for annual reports and inspections.

- 2.4.2S Initiate and collect stormwater BMP data from other DEP programs implementing provisions of the Chapter 102 regulations, to include required post-construction stormwater management.
- 2.4.3S Continue to track MS4 PRP submission, review, and approval.
- 2.5.3S Continue to implement the NPDES Municipal Stormwater Program Delegation, to include permitting, compliance, inspection, and enforcement.
- 2.5.6S Continue to implement the NPDES Construction Stormwater Program Delegation, to include permitting, compliance, inspection, and enforcement.
- 2.5.7S Continue water quality demonstration requirements for post-construction stormwater management.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Grey Infrastructure (IDDE)



Grey Infrastructure improvements through Illicit Discharge Detection and Elimination (IDDE) involve addressing non-stormwater discharges into a surface water discharging storm drain system. This practice would be reported as an annual practice. DEP has instituted an e-Inspection application for MS4 inspections, reporting of IDDE implementation remains a challenge.

Linkage to Programmatic Milestones:

2.4.1S Collect Municipal Separate Storm Sewer System (MS4) BMP data using the new reporting system for electronic submission for annual reports and inspections.

2.4.3S Continue to track MS4 PRP submission, review, and approval.

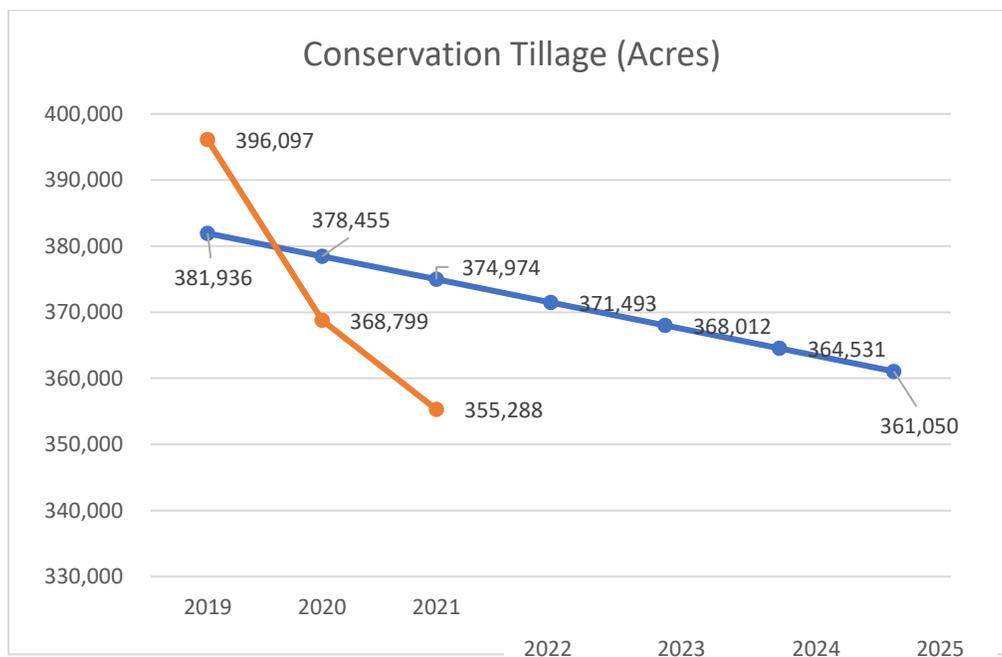
2.5.3S Continue to implement the NPDES Municipal Stormwater Program Delegation, to include permitting, compliance, inspection, and enforcement.

3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.

3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.

3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Conservation Tillage (30-60% Residue)

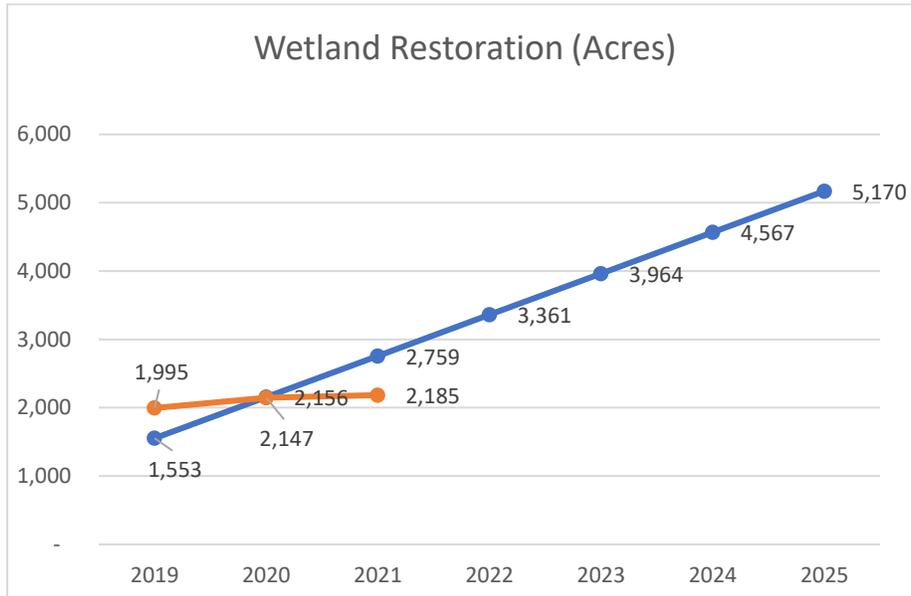


Conservation Tillage is a high-priority BMP and is included in the “Soil Health” category in the Phase 3 WIP. This practice is defined as 30% to 60% of growing or residue cover on row crop acres and is currently collected through annual Transect Surveys. The resulting percentage of covered observations are extrapolated to the county row crop acres based on NASS annual crop acreages provided by the Bay Program. It is expected that Conservation Tillage will diminish through 2025 as more fields are managed with High Residue Tillage Management.

Linkage to Programmatic Milestones:

- 2.1.1A Continue communication, outreach and stewardship programs to increase the use of conservation tillage and no-till practices.
- 2.3.4A Develop web-based and in-person training for Manure Management Planning and Agriculture Erosion and Sediment Control Planning.
- 2.3.6A Coordinate existing technical assistance for more effective and efficient deployment of services.
- 2.4.1A Work with the Chesapeake Bay Program Partnership to establish a creditable practice or combination of practices for implementation of advanced soil health strategies or plans on farms in the Chesapeake Bay Watershed Model for future crediting of these initiatives. Once established as a practice or set of practices that can be credited for progress in the model, commit additional funding or the technical and financial assistance necessary to implement these practices.
- 2.4.3 Work with the Chesapeake Bay Program Partnership, Water Quality Goal Implementation Team, to elicit support for a joint remote sensing project with other jurisdictions.
- 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
- 2.5.5A Participate in EPA's formal assessment of Pennsylvania's Animal Agriculture Programs.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Wetland Restoration



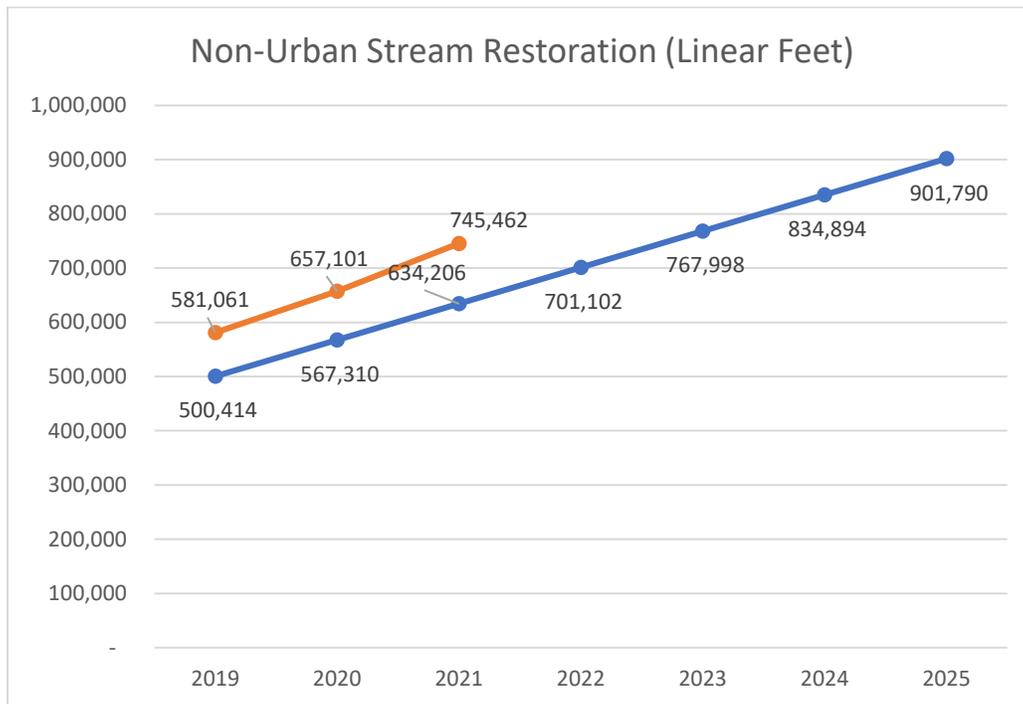
Wetland Restoration implementation and reporting can be improved through MS4 expanded opportunities as well as policy changes to improve crediting of legacy sediment removal and ecosystem restoration and to allow for wetlands restored through compensatory mitigation programs to be reported for credit. Additionally, education related to data management and tracking of the integrated parts of a stream and floodplain restoration project will yield more accurate reporting of wetlands restored through management actions and grant programs. Wetland Restoration also undergoes “back out” of the model due to land use mapping, which may also reduce the cumulatively tracked management actions and reductions associated with those actions in modeled progress. More than 1,200 acres of restored wetlands reported through 2017 had undergone “back out.” The DEP Growing Greener Plus grant program was adjusted in 2021 to provide additional preference toward flood resiliency projects, including wetland restoration projects. The 2021 EPA Most Effective Basin funding for Environmental Justice (EJ) areas was allocated to a large-scale, multi-year urban stream, floodplain, and wetland restoration project in a Tier 1 county.

Linkage to Programmatic Milestones:

- 2.1.4F Emphasize the full range of benefits & co-benefits of stream and wetland restoration to facilitate additional implementation.
- 2.1.2S Provide more awareness of the expanded opportunities for BMP implementation in connection with the MS4 permit requirements.
- 2.2.6F Leverage existing funding sources for Stream and Wetland Restoration.

- 2.2.8F 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 from legacy sediment removal and associated ecosystem restoration.
- 2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.
- 2.3.4F Provide informed technical assistance for stream and wetland restoration projects to ensure they are completed in an adequate, reportable manner.
- 2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
- 2.3.5F Expand the Pennsylvania Fish and 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 pilot counties to include Adams, Franklin, Lancaster and York.
- 2.4.1F Ensure adequate tracking of partner-implemented forestry BMPs including forest buffers, tree canopy, conservation landscaping, urban forest expansion, stream wetland restoration.
- 2.4.6 Work with EPA and the Chesapeake Bay Program Partnership to enhance the existing crediting protocols for programs and practices that improve water quality in Pennsylvania not currently getting full credit in the Chesapeake Bay Watershed Model.
- 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
- 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
- 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Non-Urban Stream Restoration



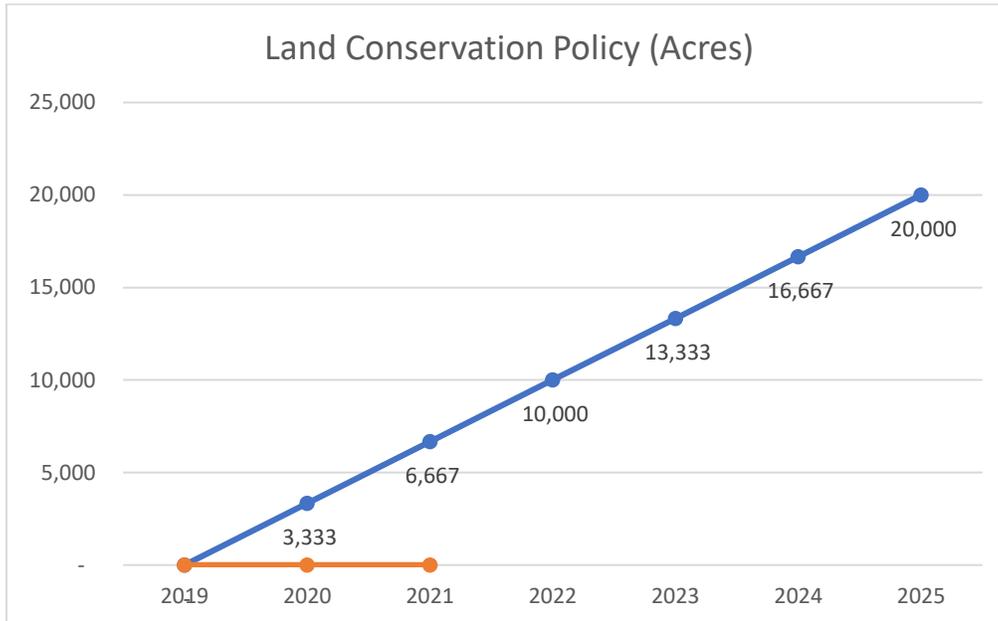
Most stream restoration projects reported in Pennsylvania are sited in non-urban environments. Project reporting based on individual stream restoration crediting protocol would improve practice crediting, provided the appropriate data is collected and reported. Further implementation of non-urban stream restoration can also be achieved through the MS4 expanded opportunities as well as policy changes to improve crediting of legacy sediment removal and ecosystem restoration and to allow for streams restored through compensatory mitigation programs to be reported for credit. The DEP Growing Greener Plus grant program was adjusted in 2021 to provide additional preference toward flood resiliency projects, including non-urban stream restoration projects.

Linkage to Programmatic Milestones:

- 2.1.4F Emphasize the full range of benefits & co-benefits of stream and wetland restoration to facilitate additional implementation.
- 2.1.2S Provide more awareness of the expanded opportunities for BMP implementation in connection with the MS4 permit requirements.
- 2.2.6F Leverage existing funding sources for Stream and Wetland Restoration.
- 2.2.8F 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 from legacy sediment removal and associated ecosystem restoration.
- 2.3.1 Implement a pilot of the Center for Water Quality Excellence concept in the four pilot counties of Lancaster, York, Adams, and Franklin.
 - 2.3.4F Provide informed technical assistance for stream and wetland restoration projects to ensure they are completed in an adequate, reportable manner.
 - 2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.
 - 2.3.5F Expand the Pennsylvania Fish and 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 pilot counties to include Adams, Franklin, Lancaster and York.
 - 2.4.1F Ensure adequate tracking of partner-implemented forestry BMPs including forest buffers, tree canopy, conservation landscaping, urban forest expansion, stream and wetland restoration.
 - 2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.
 - 2.4.6 Work with EPA and the Chesapeake Bay Program Partnership to enhance the existing crediting protocols for programs and practices that improve water quality in Pennsylvania not currently getting full credit in the Chesapeake Bay Watershed Model.
 - 2.4.7 Install additional monitoring station(s) and begin to collect “real-time water quality data on the Susquehanna River to further document the story of progress made by Pennsylvania’s efforts to restore local streams and the Chesapeake Bay as part of implementation of the Phase 3 WIP.
 - 3.1.3 CAP implementation across Pilot, Tier 2, 3, and 4 counties.
 - 3.4.1 Track and report progress in Phase 3 WIP planning and implementation in all counties.
 - 3.4.3 Track and report progress to continue implementation of the Phase 3 WIP State Numeric Commitments described in Section 4, State Actions in the counties with minimal reductions.

Land Conservation Policy



Pennsylvania’s approach to land conservation consists of four main components: State Forest Conservation, Private Forest Conservation, Wetland Conservation, and Farmland Conservation/Preservation. Most land use planning and decisions are made locally within the context of the Pennsylvania Municipalities Planning Code, which enables local planning, zoning, ordinances, and other measures that affect growth and development. Planning for growth also needs to consider impacts to future business activity and economic development opportunities, historical land uses, and the many benefits of conserving natural resources. Pennsylvania chose to follow the Chesapeake Bay Program’s framework for sector growth. Goals were established for forest and natural area conservation, as well as farmland preservation based on the highly popular and successful Farmland Preservation Program. The WIP planned for 20,000 acres of this BMP through conservation. This is a new BMP used for WIP planning and reporting for this practice is still being developed.

Linkage to Programmatic Milestones:

- 2.1.2F Implement a communication/outreach program to engage a variety of turf owners to plant trees and meadows on their properties.
- 2.1.3F Communicate the importance and values of forests and farmland to facilitate and encourage state and local land conservation programs.

Conclusion

These 2-Year Milestones developed for the period 2022 through 2023 are based on BMP implementation levels from Pennsylvania's Phase 3 WIP. As we progress through 2022 and into further years, continual assessments will be made to direct adaptive management efforts and to identify where targets are being met and the programs that have been successful in completing these projects. BMPs lost due to credit duration expiration will continue to be identified and incorporated in the overall assessment, as these BMPs represent historic management actions taken to address water quality impairments. Lessons learned by federal, state, and county programs as outreach efforts and implementation activities are conducted will be shared to best direct continued improvement in BMP implementation throughout Pennsylvania's Chesapeake Bay Watershed and the local CAPs. These efforts will inform the next 2-year milestone period through 2025 and the completion of the Phase 3 WIP objectives.