

Pennsylvania Numeric Milestones 2020-2021
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.

Table of Contents

Executive Summary	1
Introduction	2
Nutrient Management - Core Nitrogen	5
Soil Conservation and Water Quality Plans.....	7
Traditional Cover Crops	9
Traditional Cover Crops with Fall Nutrients Applied	10
High Residue Tillage Management	12
Animal Waste Management Systems (AWMS)	13
Grass Buffers	15
Forest Buffers.....	16
Forest Buffers with Streamside Exclusion Fencing	18
Grass Buffers with Streamside Exclusion Fencing.....	20
Prescribed/Rotational Grazing	21
Manure Incorporation / Injection	23
Urban Stream Restoration.....	24
Urban Nutrient Management	26
Bioswales	27
Grey Infrastructure (IDDE)	28
Conservation Tillage.....	29
Wetland Restoration.....	30
Non-Urban Stream Restoration.....	32
Land Conservation Policy.....	34
Conclusion	35

Executive Summary

The Pennsylvania Department of Environmental Protection (PADEP) presents these 2020 through 2021, 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 2021. 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 2021 Milestone implementation rates are shown in green. Implementation levels beyond 2021 are included to show anticipated implementation through 2025, however these will be revised with future 2-year numeric milestone targets in 2022 and 2024. Countywide Action Plans (CAPs) have been developed for the four pilot counties (Lancaster, York, Adams, and Franklin) with additional county plans currently under development in Pennsylvania's Tier 2 counties. 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

- 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.

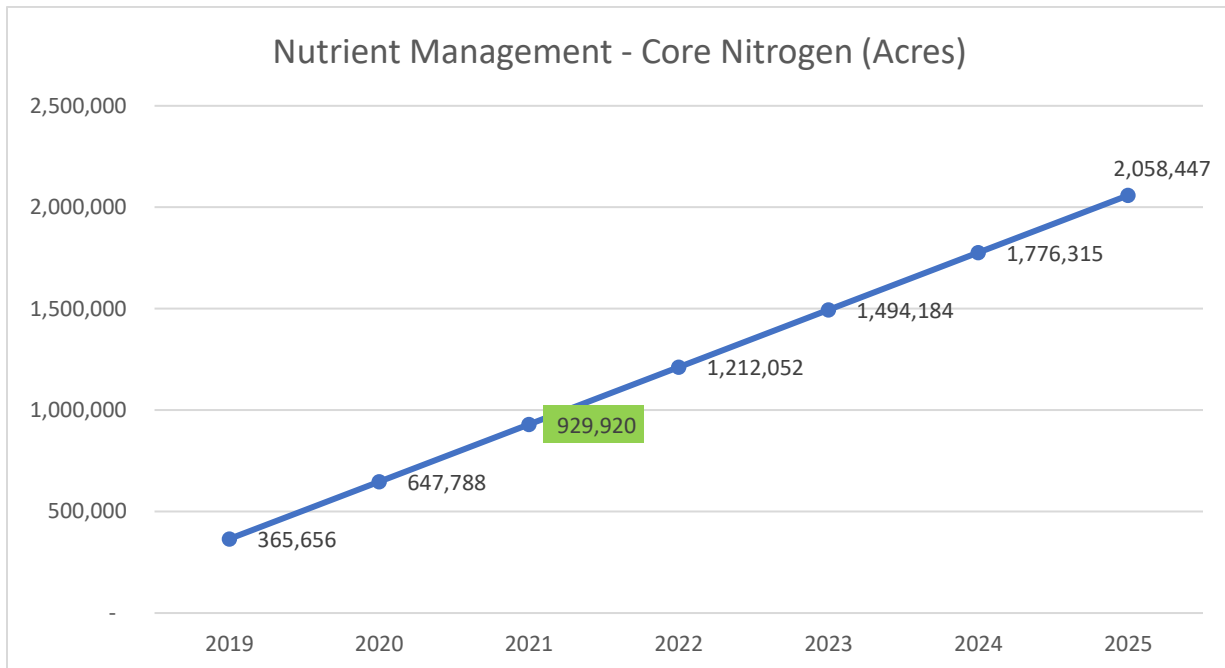
Data reporting specifics are detailed in Pennsylvania's Quality Assurance Project Plan (QAPP) for Chesapeake Bay reporting (revised August 2019). CAP goals for BMP implementation can be found in those plans. Information specific to the verification of BMPs can be found in Pennsylvania's BMP Verification Program Plan, which is an addendum to our QAPP.

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.

Table 1. Pennsylvania's 2-Year Milestones Through 2025

	Unit	Baseline		2020-2021 MS		2022-2023 MS		2024-2025 MS	
		2018	2019	2020	2021	2022	2023	2024	2025
<i>Best Management Practices (60% N Reduction)</i>									
Nutrient Application Management Core Nitrogen	Acres	523,192	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	369,112	387,127	708,372	1,029,616	1,350,861	1,672,105	1,993,350	2,314,594
Cover Crop, Traditional	Acres	226,576	170,635	180,188	189,742	199,295	208,848	218,402	227,955
Cover Crop, Traditional with Fall Nutrients	Acres	27,765	14,428	94,768	175,109	255,449	335,790	416,130	496,470
High Residue Tillage Management	Acres	585,290	597,766	639,880	681,994	724,108	766,222	808,336	850,450
Animal Waste Management Systems	Animal Units	958,661	1,061,846	1,140,000	1,250,000	1,450,000	1,700,000	1,975,000	2,320,984
Grass Buffers	Acres	12,802	12,363	18,547	24,731	30,915	37,099	43,283	49,467
Forest Buffers	Acres	17,670	9,780	20,380	30,980	41,579	52,179	62,779	73,378
Forest Buffers, Streamside Exclusion Fencing	Acres	7	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	407	390	2,004	3,618	5,232	6,846	8,460	10,074
Prescribed/Rotational Grazing	Acres	30,554	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	1,200	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	45	-	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>									
Conservation Tillage	Acres	362,011	381,936	378,455	374,974	371,493	368,012	364,531	361,050
Wetland Restoration	Acres	1,988	1,553	2,156	2,759	3,361	3,964	4,567	5,170
Non-Urban Stream Restoration	Linear Feet	552,593	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



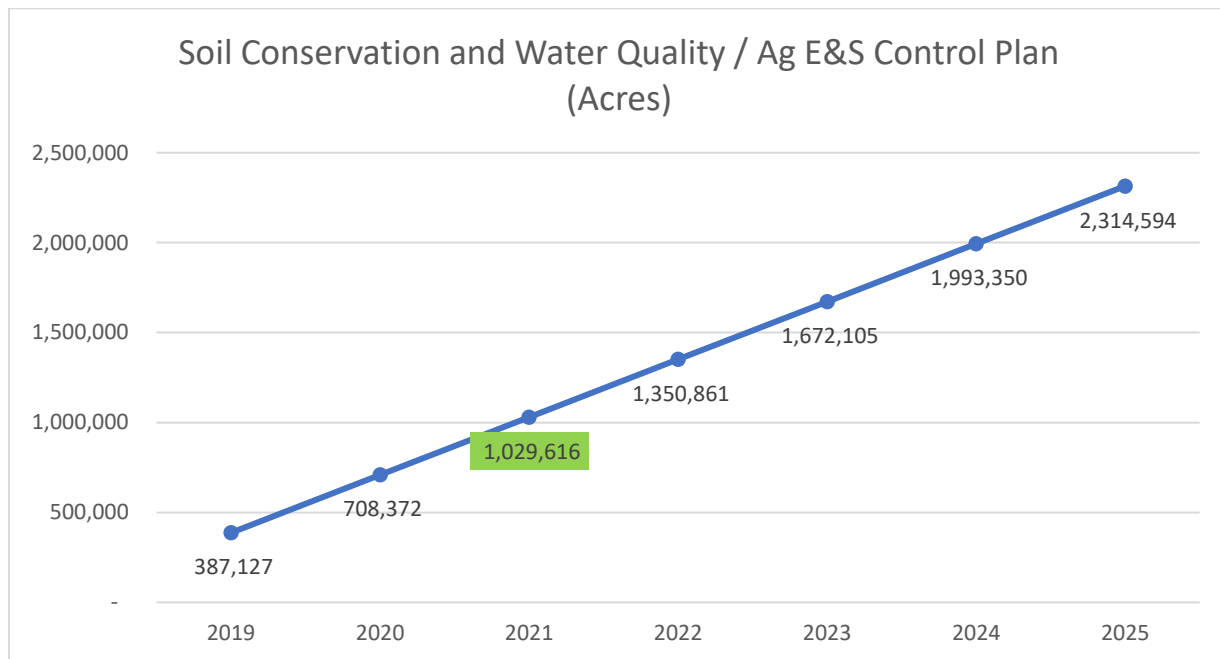
Nutrient Management, Core Nitrogen is a high-priority BMP and is included in the “Agricultural Compliance” category in the Phase 3 WIP. This practice includes implementation of Pennsylvania’s Act 38 Nutrient Management Program requirements and Chapter 91 Manure Management regulations. Since the 2017 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). Pennsylvania plans to extrapolate reporting for the 2020 Progress Run based on findings from the Ag Inspection Program.

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.
- 2.4.4 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.
- 2.5.1 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.

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, grassed waterways, 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. Pennsylvania has begun tracking and reporting the development and implementation of Agricultural Erosion and Sediment Control (Ag E&S) Plans. We plan to extrapolate this plan acreage in 2020 based on findings of our Agricultural Inspection Program which will be documented in the updated 2020 QAPP document.

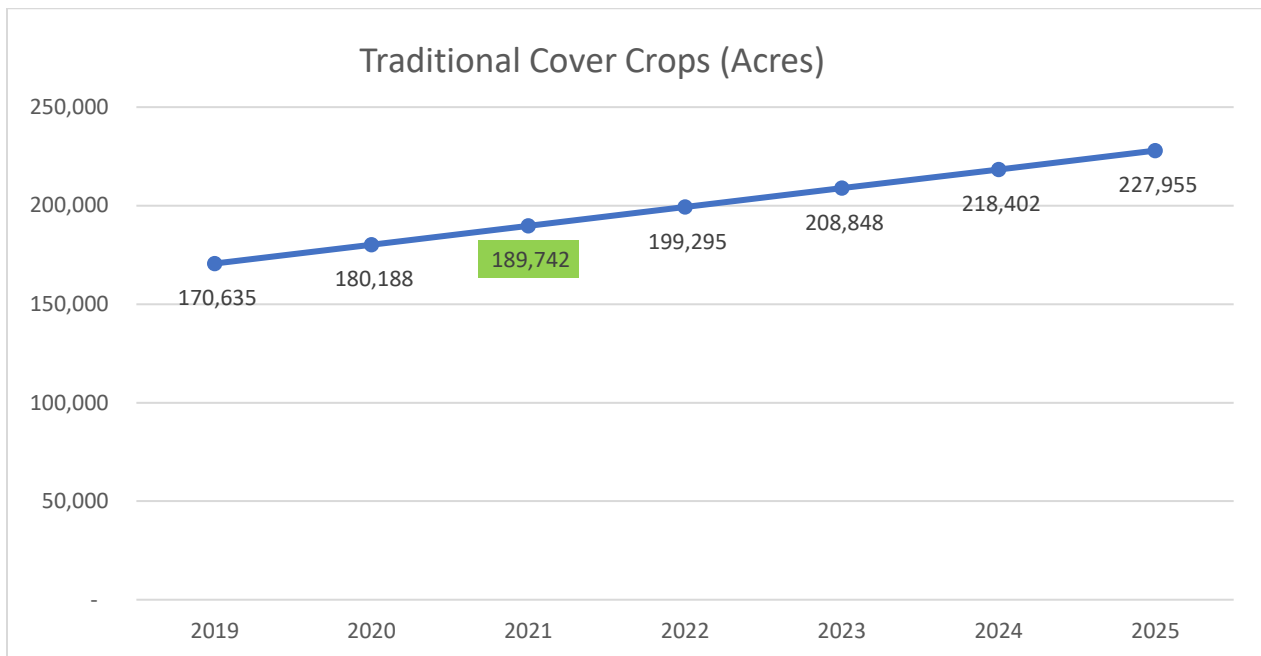
Linkage to Programmatic Milestones:

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.
- 2.4.3 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.
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- 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

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. 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.

Linkage to Programmatic Milestones:

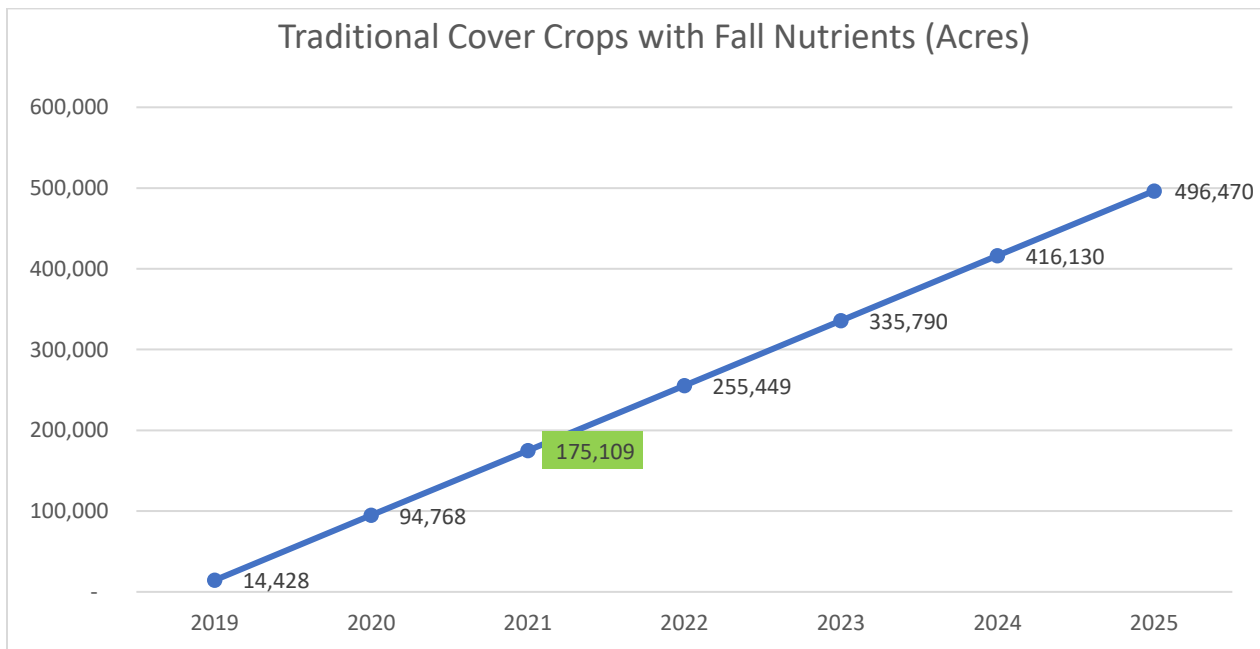
- 2.1.2A Continue communication, outreach and stewardship programs to increase implementation of cover crops
- 2.3.1A Initiate Implementation of Pennsylvania’s Agriculture Conservation Stewardship Program
- 2.3.2A Work with third-parties, integrators, and co-ops to identify alternative methods to support 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.
- 2.4.1A 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.

Traditional Cover Crops with Fall Nutrients Applied



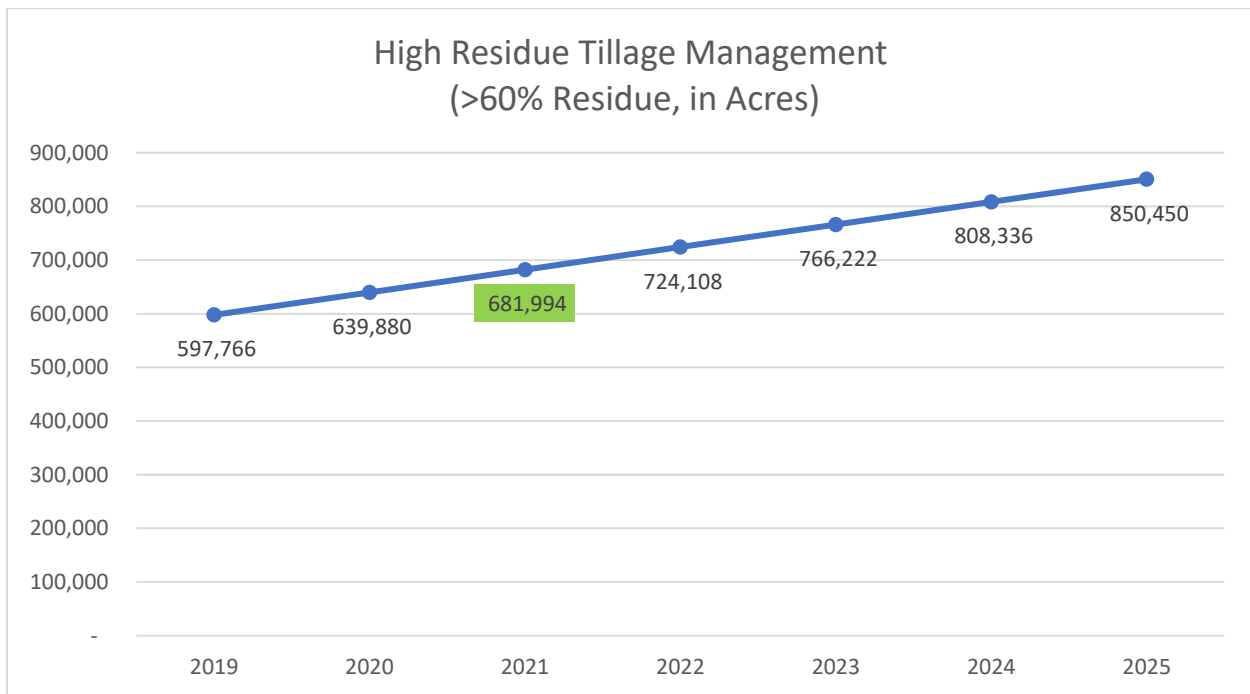
Traditional Cover Crops with fall nutrients applied (not harvested) is a high-priority BMP and is included in the “Soil Health” category in the Phase 3 WIP. This practice is currently collected through the annual Transect Surveys. The resulting percentage of covered observations are extrapolated to the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

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.
- 2.4.1A 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.

High Residue Tillage Management



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 “continuous 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.

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

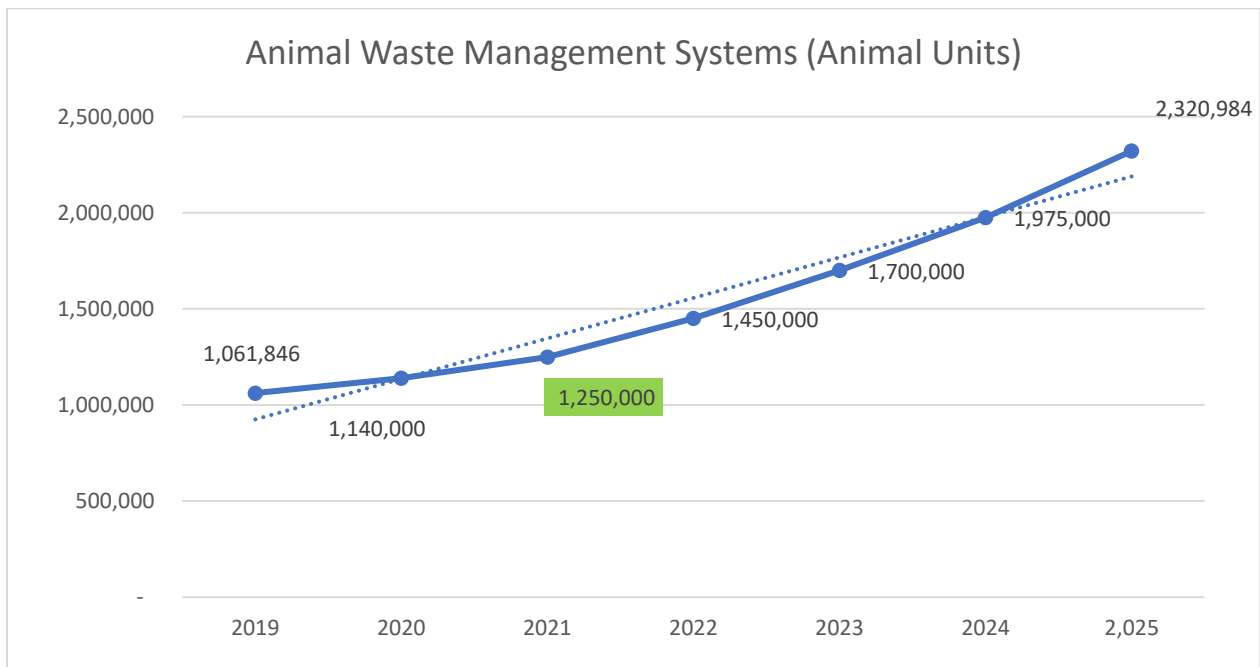
2.3.5A Focus technical assistance and financial resources in areas of highest need and impact to the Chesapeake Bay, to include targeted watershed approach.

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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.

Animal Waste Management Systems (AWMS)



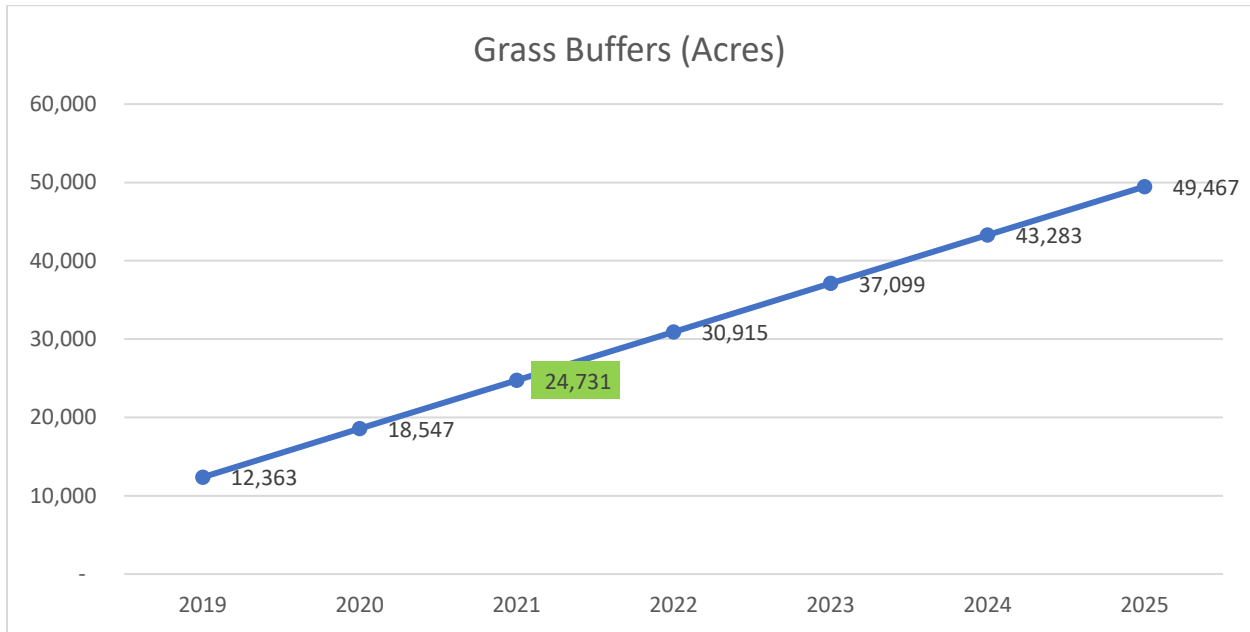
Livestock and Poultry Animal Waste Management Systems are reported in Animal Units (AU). One AU equals 1,000 pounds of animal weight. Pennsylvania projected non-linear growth for this practice due to added lead time for implementation due to the need

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.
- 2.4.3 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.
- 2.5.1A Implement NPDES Concentrated Animal Feeding Operation (CAFO) Program Delegation
- 2.5.2A Complete complaint follow-up for CAFO and non-CAFO facilities
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Grass Buffers

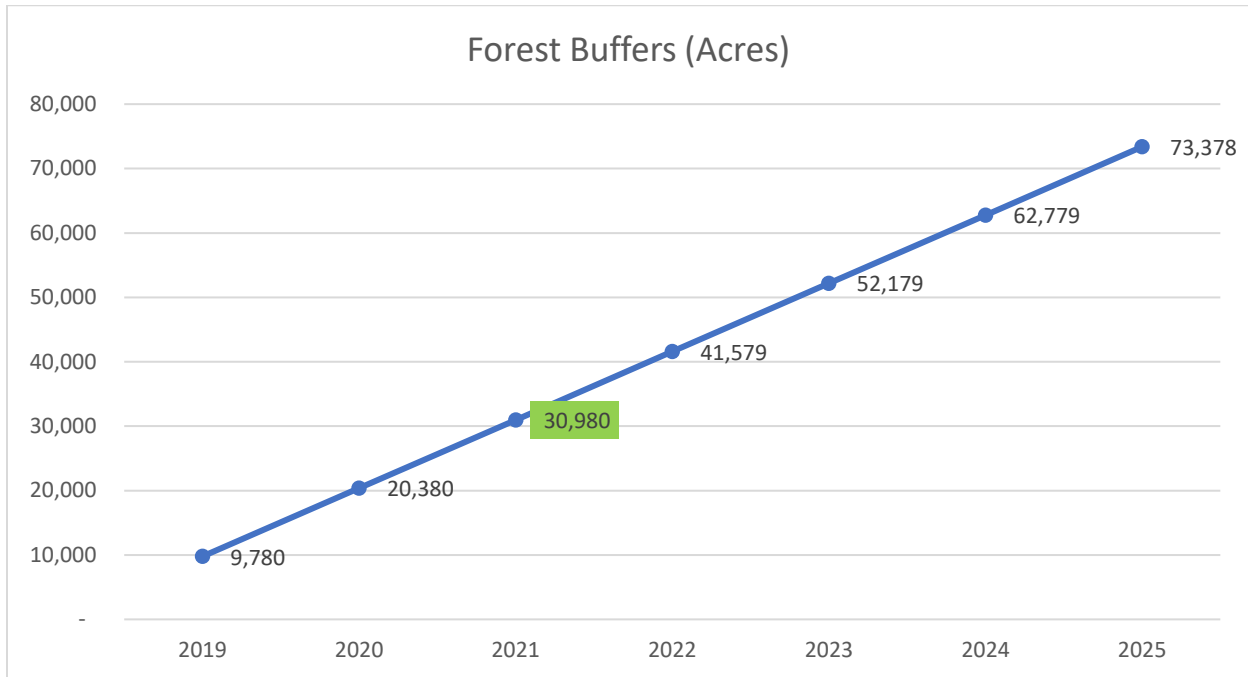


Grass Buffers is a high-priority BMP. This practice provides stabilization and nutrient uptake adjacent to fields and other areas where trees are not planted. Grass Buffers with streamside exclusion fencing is provided separately in this milestone report.

Linkage to Programmatic Milestones:

- 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.

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 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.

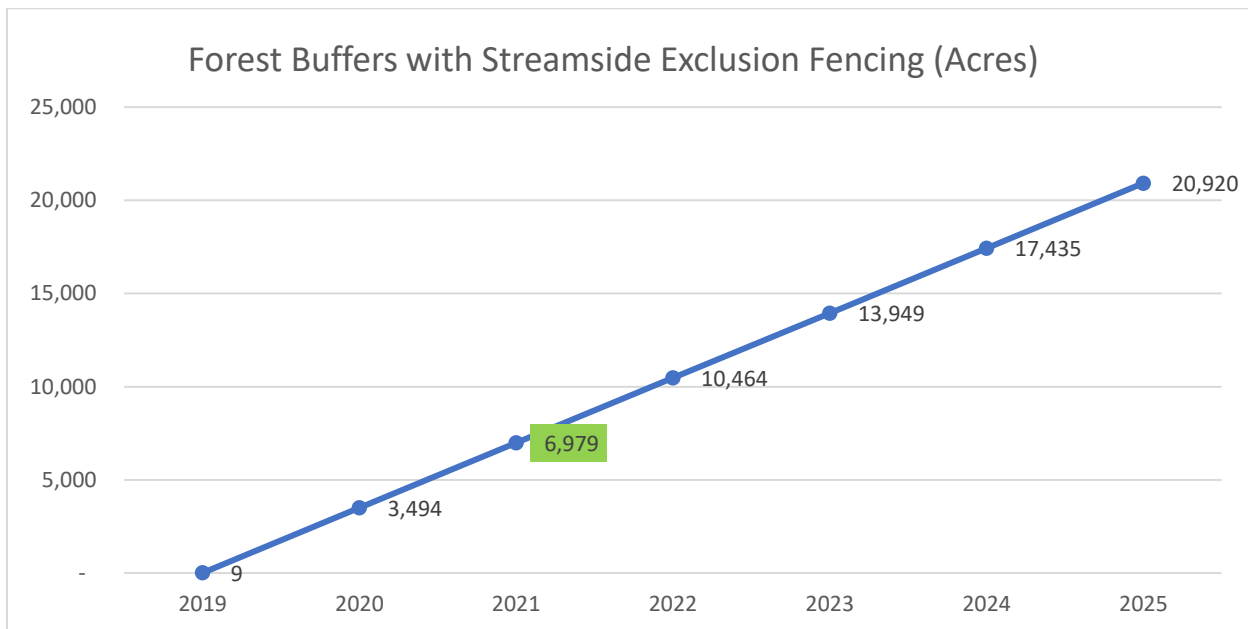
2.2.3F Create additional, flexible funding options for riparian forest buffers.

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.

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.

Linkage to Programmatic Milestones:

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

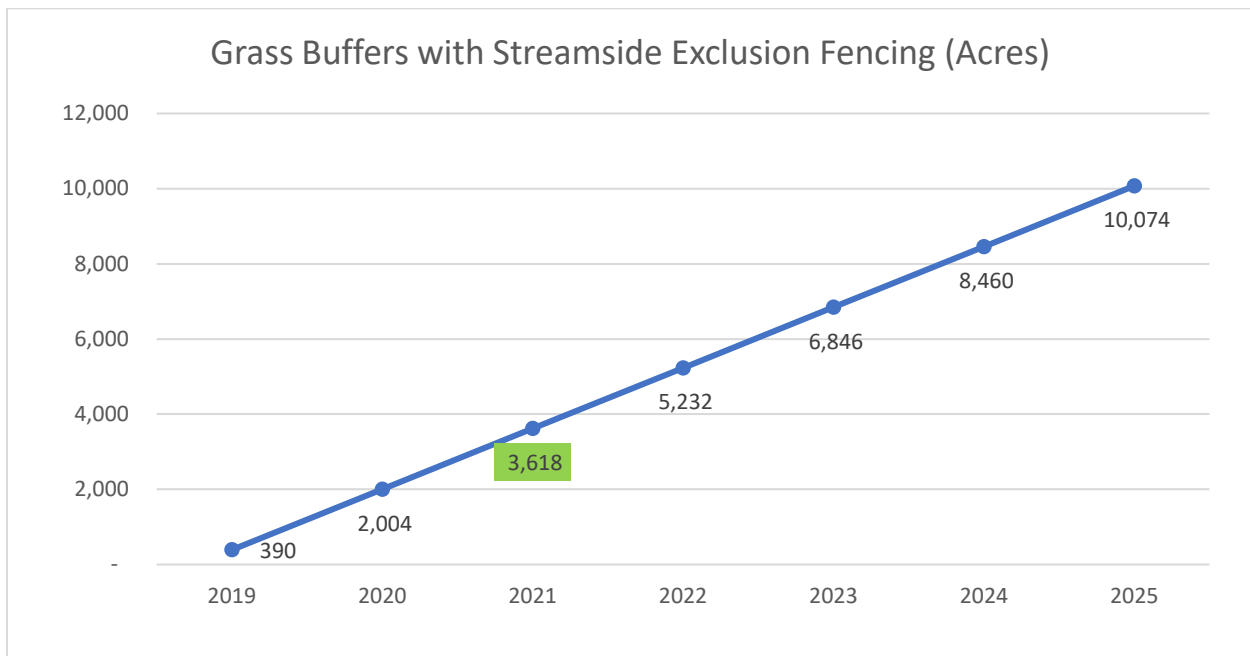
2.1.3A Continue communication, outreach and stewardship programs to increase implementation of pasture management.

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

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- 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.

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. 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.

Linkage to Programmatic Milestones:

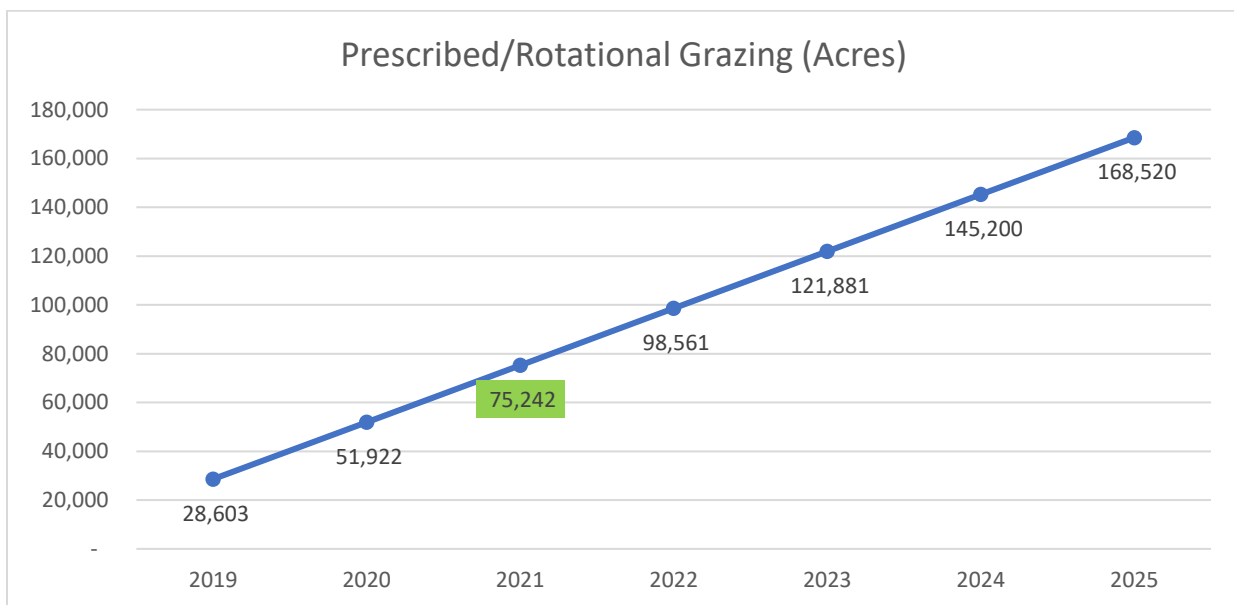
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Prescribed/Rotational Grazing



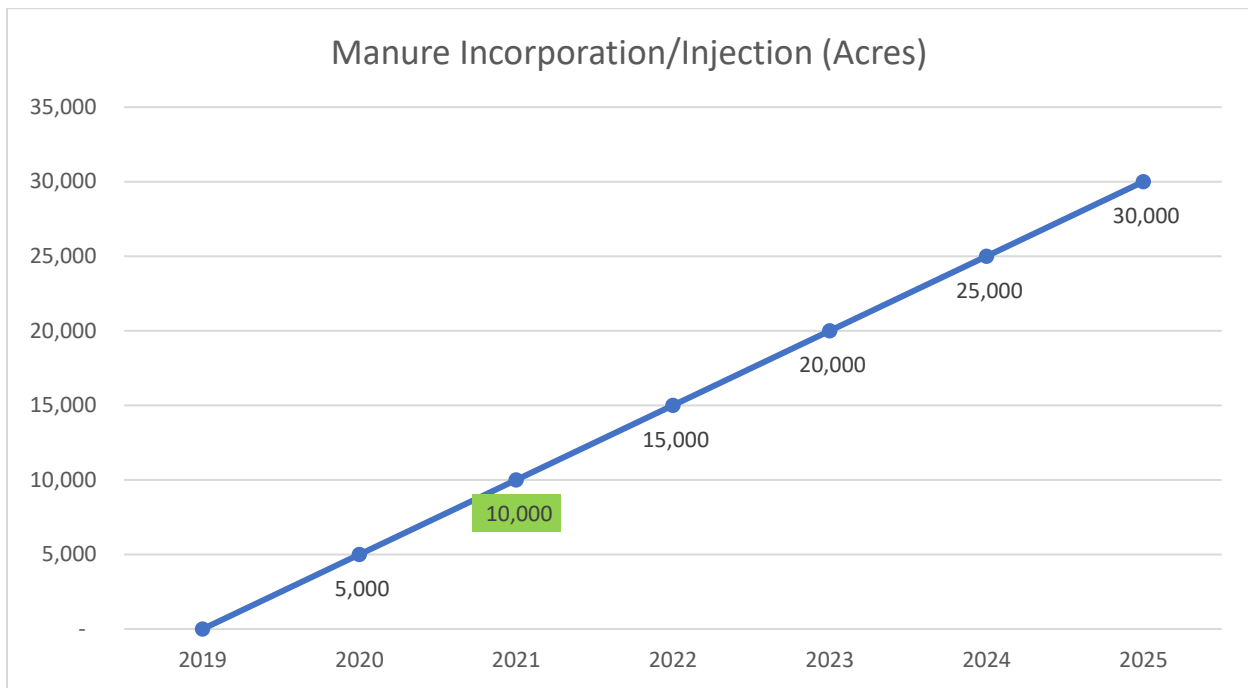
Prescribed (or rotational) grazing is a pasture management system that optimizes soil and pasture health by limiting overgrazing of pastures. This BMP has primarily been reported through NRCS cost-share implementation, although the capability to more completely report this practice has been developed 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.
- 2.4.4 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.
- 2.5.1A 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.

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. However, manure injection is currently being piloted throughout the southern part of Pennsylvania's watershed and shows positive results. While Manure Incorporation/Injection is not currently tracked and reported, efforts are underway to better collect and report this BMP.

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
- 2.4.3A 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

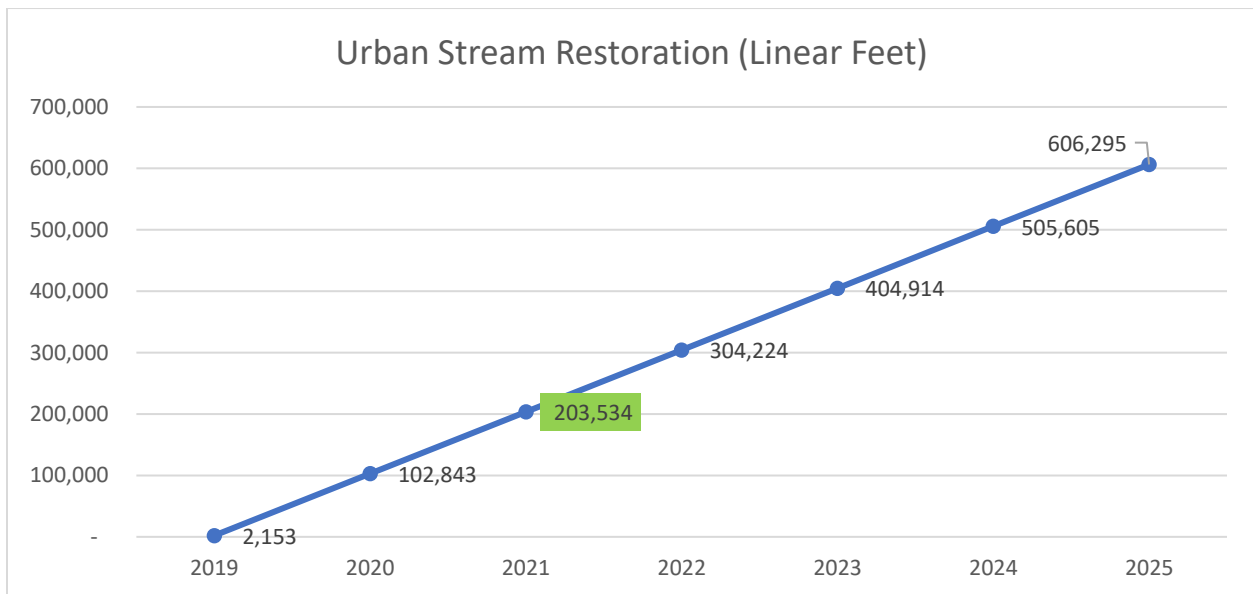
2.4.5A Inventory existing BMPs and BMP needs through survey, agricultural planning, and inspection programs, focusing on geographic areas through the Tiered approach.

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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.

Urban Stream Restoration



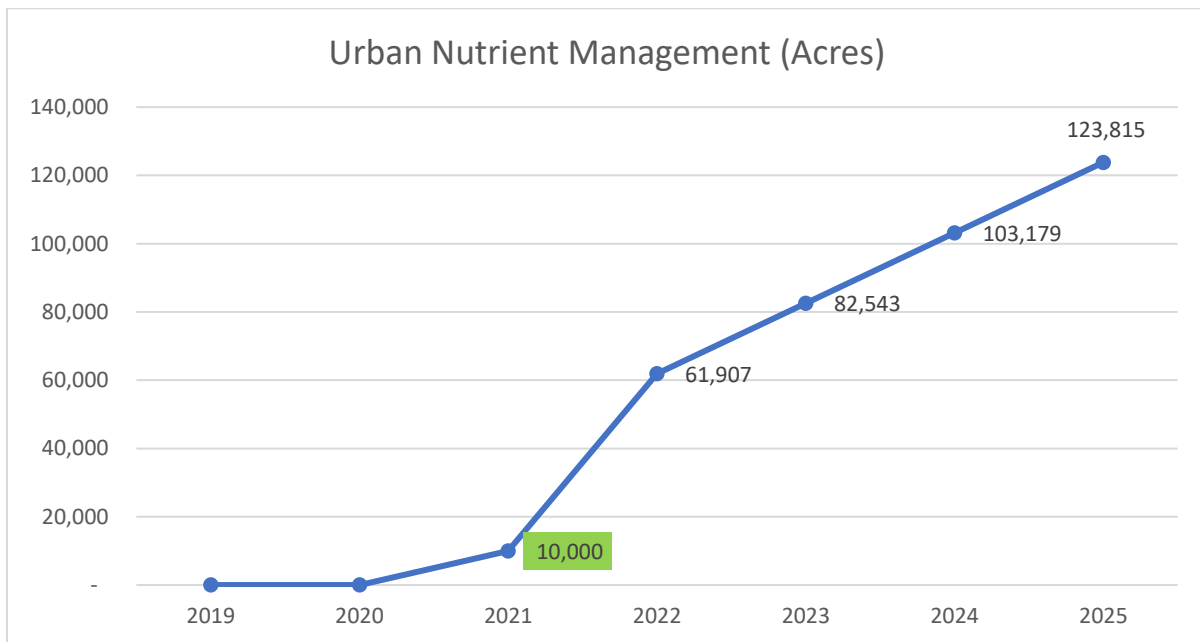
Stream Restoration projects are often not well attributed to urban environments; most projects are located within non-urban settings. Additional future reporting of Urban Stream Restoration is expected to be predominantly collected from Municipal Separate Storm Sewer System (MS4) Permittees' implementation of their Pollutant Reduction Plans (PRPs)/Total Maximum Daily Load (TMDL) Plans.

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.
- 2.4.6 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.
- 2.5.3S Continue to implement the NPDES Municipal Stormwater Program Delegation, to include permitting, compliance, inspection, and enforcement.

Urban Nutrient Management

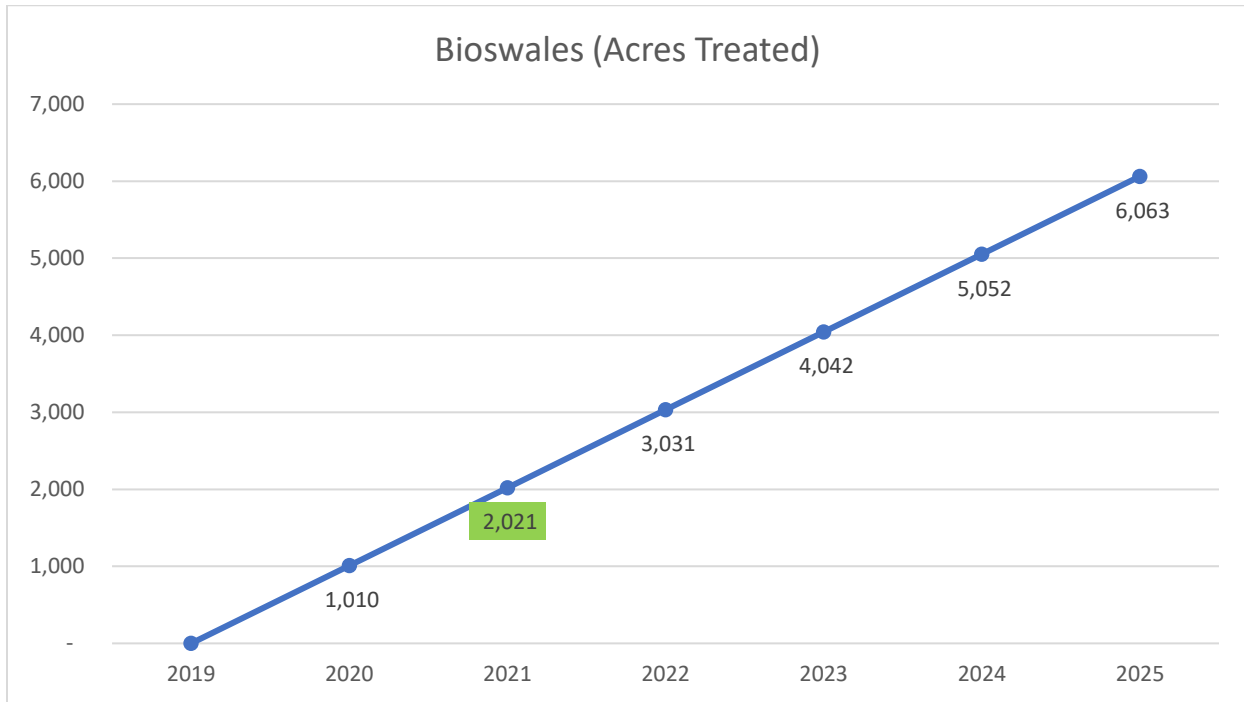


Urban Nutrient Management uses the control of nutrient application on turf grass to reduce loads in the urban environment. This practice is not currently tracked or reported. It is expected that these acres will be reported through MS4 PRPs through the potential implementation from the proposed Fertilizer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

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
- 2.5.1 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.

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 Runoff Reduction and Stormwater Treatment Performance Standard reporting when possible to more completely capture stormwater management practices, particularly where used for required post-construction stormwater management.

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

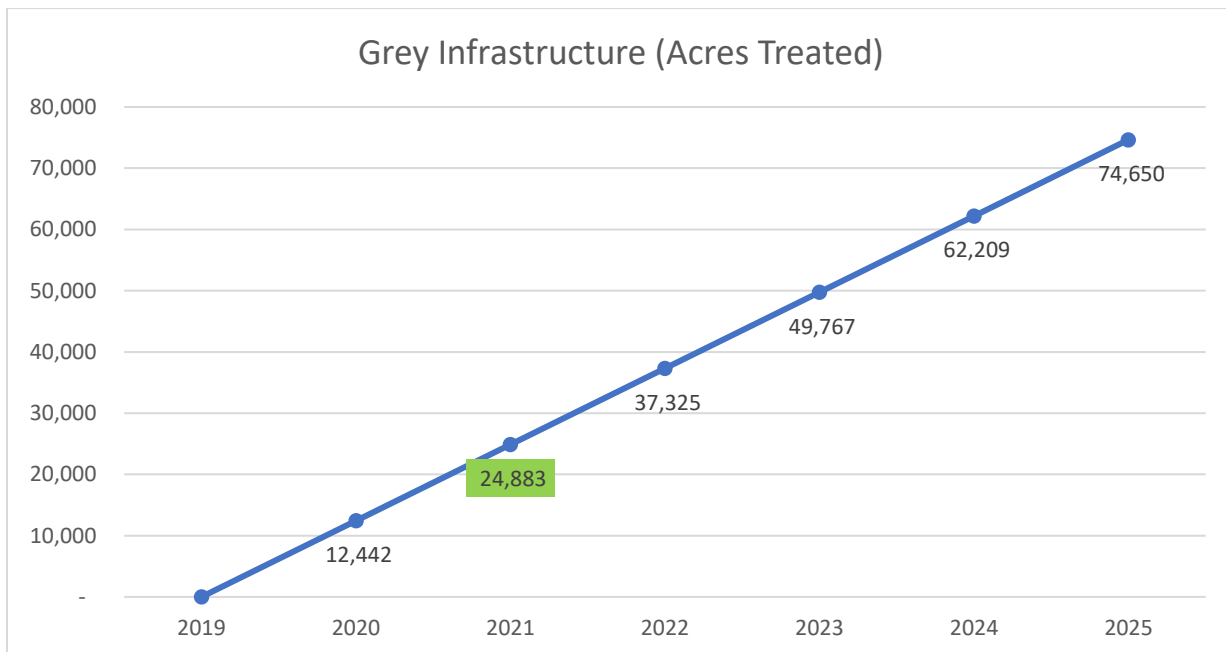
2.4.1S Collect Municipal Separate Storm Sewer System (MS4) BMP data using the new reporting systems for electronic submission for annual reports and inspections

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.

2.5.3S 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

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. DEP has instituted an e-Inspection application for MS4 inspections and intends to provide further detail in the 2020 QAPP update. Reporting from MS4 PRPs will additionally support the implementation of this BMP.

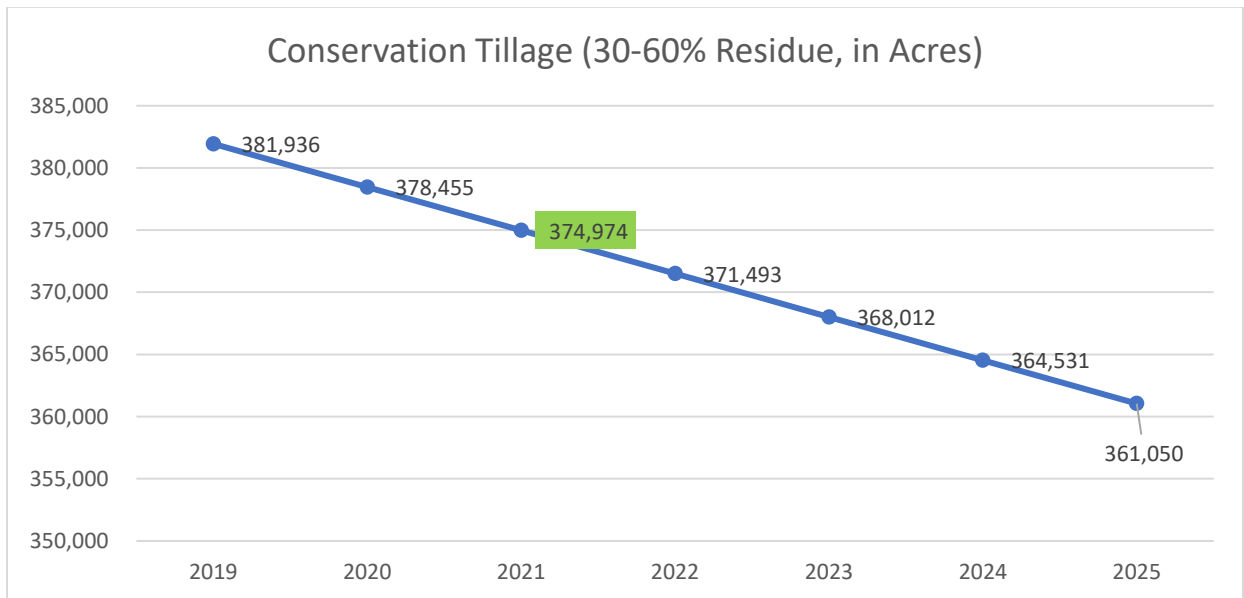
Linkage to Programmatic Milestones:

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

2.5.1S Complete the Pollutant Reduction or Total Maximum Daily Load Plan Reviews for the 2018 Municipal Separate Storm Sewer System (MS4) permits

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

Conservation Tillage



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

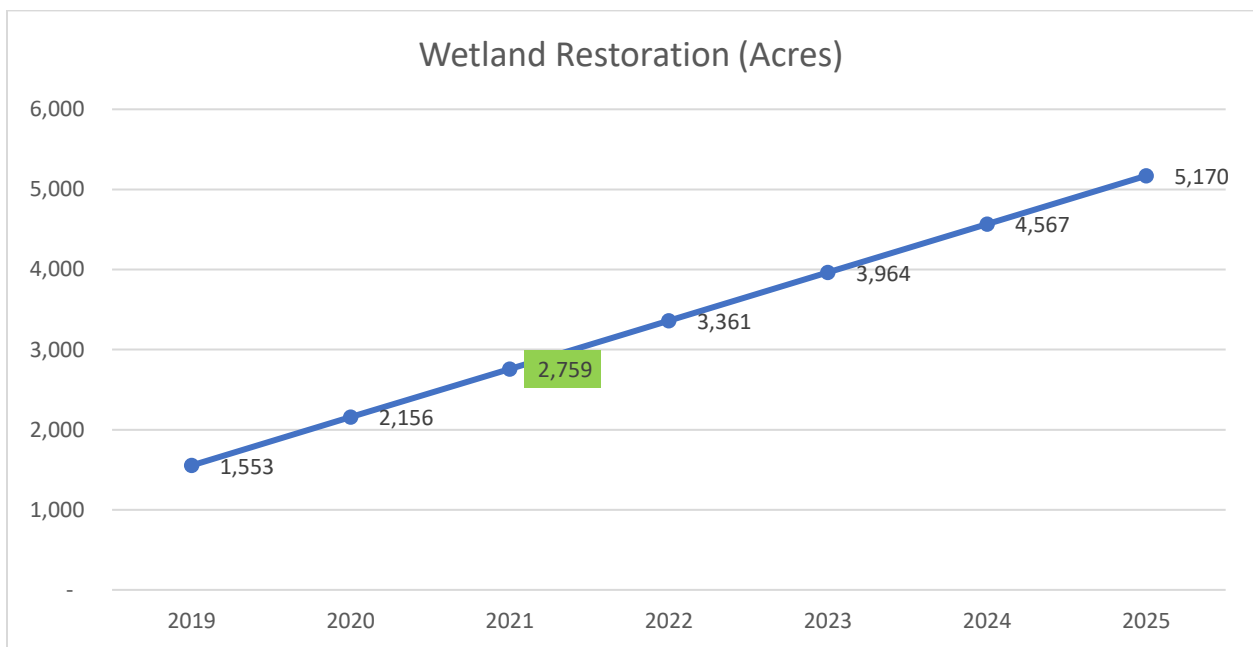
2.4.1A Work with the Chesapeake Bay Program Partnership to establish a creditable practice or combination of practices for implementation of advanced soil health strategies or plans on farms in the Chesapeake Bay Watershed Model for future

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.

Wetland Restoration



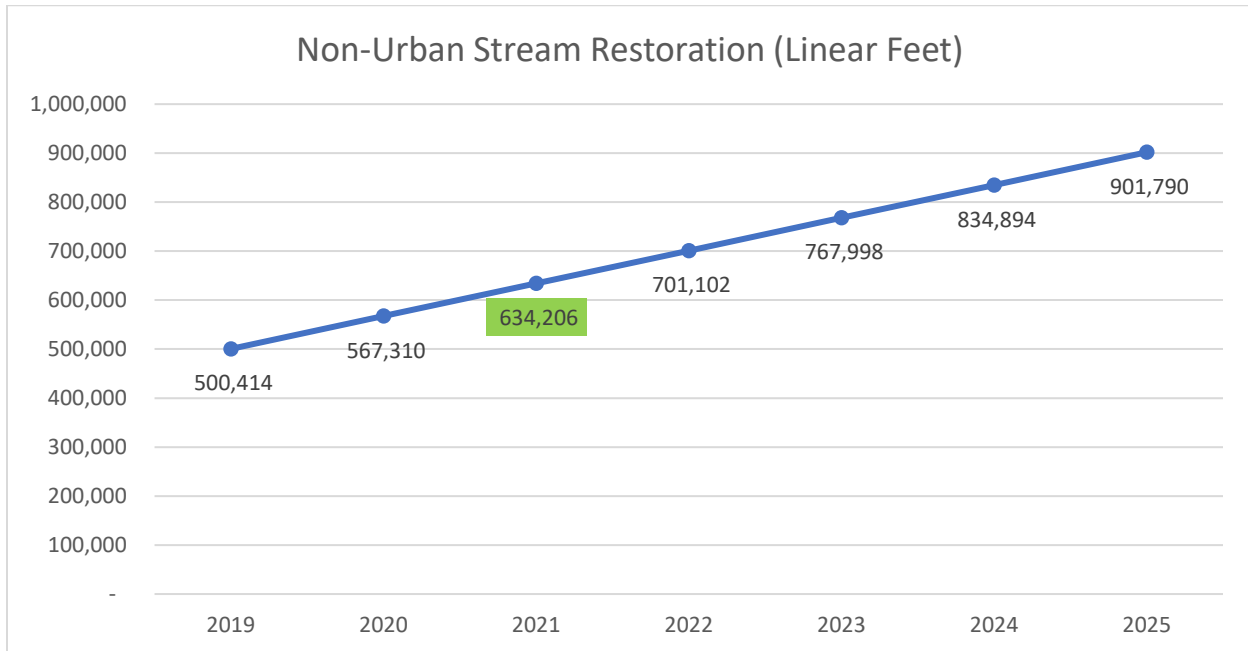
Wetland Restoration implementation and reporting can be improved through MS4 expanded opportunities as well as policy changes to improve crediting of legacy sediment removal and ecosystem restoration and to allow for wetlands restored through compensatory mitigation programs to be reported for credit.

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.

Non-Urban Stream Restoration



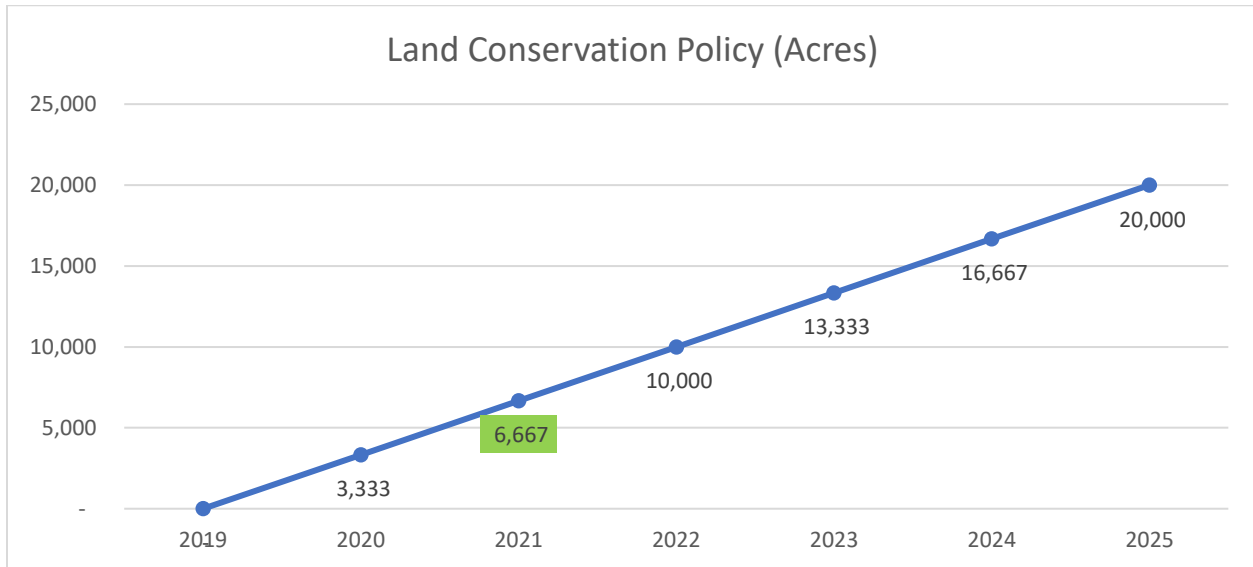
Most stream restoration projects reported in Pennsylvania are sited in non-urban environments. Project reporting based on individual stream restoration crediting protocol would improve practice crediting, provided the appropriate data is collected and reported. Further implementation of non-urban stream 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.

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

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 2020 through 2021 are based on BMP implementation levels from Pennsylvania's Phase 3 WIP. PADEP is continuing local CAP development efforts during this period which will provide additional guidance on BMPs that can be implemented within each county's plan. As we progress through 2020 and at the conclusion of the 2021 Progress Run, an assessment 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. 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 2022 through 2023, 2-year milestone period through 2025 and the completion of the Phase 3 WIP objectives.