



Lancaster
CLEAN WATER PARTNERS

Lancaster Countywide Action Plan

A Strategy for Restoring Lancaster's Waterways

2024 Update

CONTENTS

3

Introduction

4

Collaborative
Values

5

Our Strategy

6

Celebrating
Successes in 2023

8

Highlights

9

Priority Initiatives

21

Reflections

23

Get in Touch

Lancaster County streams have the biggest restoration opportunity of any monitored areas of the Chesapeake Bay watershed. With a mixture of rural, suburban, and urban landscapes, the sources for water pollution are broad – **but, so are the opportunities for conservation and restoration.**

Cover: Photo courtesy of Lancaster Clean Water Partners.

Right: Kiwanis Loop. Photo courtesy of Lancaster Clean Water Partners.

INTRODUCTION

More than half of Lancaster County's 1,400 miles of streams, and much of its groundwaters, are unhealthy.

Because of this, the Pennsylvania Department of Environmental Protection (DEP) designated the county as a priority area to reduce nitrogen and phosphorus loads by 2025 in their Watershed Implementation Plan. The Lancaster Countywide Action Plan (CAP) outlines Lancaster's path for reducing 6.4 million lbs. of nitrogen and 275,000 lbs. of phosphorus by the 2025 deadline.

Developed through a grassroots approach in 2018 and revised in 2021 and 2024, the CAP is the result of a significant, collaborative effort from experts, community members, partner organizations, state agencies, and others. Throughout the process, Lancaster kept local water quality at the forefront while striving to achieve a goal for the health of a much larger watershed.

The CAP has always embraced scientifically-based practices for achieving ambitious, yet realistic, reduction goals. The updated plan reflects a more diverse collection of conservation practices that can be implemented at a realistic rate and on the appropriate land before the 2025 deadline. The CAP achieves 66% of the total nitrogen goal and 91% of the phosphorus goal that DEP gave to Lancaster.

While the modeled results may be less than ideal, the CAP emphasizes Lancaster's local progress, as well as the lessons learned and momentum that is driving communities to meet our shared goals. Achieving these high reduction numbers will be a huge success for Lancaster County, Pennsylvania, and the Chesapeake Bay watershed. Partners in Lancaster County are ready, willing, and able



Progress

to tackle the elements of the plan but require additional resources, flexibility, and political will to achieve the intended results.

Progress regarding specific best management practices (BMPs) that is shared in this document is based on tracking at the state level, which is current as of June 2023. The CAP Coordinator Team has used local project tracking since then to guide the planning and implementation efforts.

Thank you to our lead partners who serve as the CAP Coordinator team.



Photo courtesy of Laura Pauls-Thomas.



COLLABORATIVE VALUES

Elements of Successful Partnerships

The Lancaster Clean Water Partners recognize that successful implementation hinges on collaboration with partner organizations and aligning with tools like the county comprehensive plan, Places2040. Emphasizing watershed-scale projects and the stream delisting strategy, the CAP requires shared values that reflect a diverse and resilient network of partner organizations. Countywide commitment to building strong partnerships and expanded capacity underscores that dedication to shared values. Our shared values are:



1. Collaboration not duplication - Success comes from elevating partner organizations, not from duplication of efforts and competition. The Partners use a collective impact approach to bring these groups together in a structured way, to achieve change.

Value in Action: Seek existing expertise and resources before creating something new



2. Operate with a bias toward action - We are not a “think-tank.” We value on-the-ground work and results that create momentum for innovative solutions to community problems. We strive to be change makers by doing things differently than before and seeing results like never before.

Value in Action: Operate with a can-do attitude and come to the table with solutions



3. Trust - The Partners was created by community members for community members and our grassroots approach inspires trust in the community. We believe in the words from Stephen Covey: “It is trust that turns mere coordination into true collaboration, just as it's trust that turns a group of people into a team.”

Value in Action: Promote mutual respect and honesty for well-rounded decisions when not at the table



4. Clean and clear water for all Lancastrians - Equal access to justice and clean water are human rights. Our vision of clean and clear waterways means healthy local streams for all Lancastrians, but particularly those that have historically had unequal access to it. Our collaborative work amplifies the diverse voices in our community demanding environmental and social equality.

Value in Action: Invite those not at the table to have a voice the decision-making process



5. Transparency - We communicate in a way people can verify and understand our intent. We operate with genuine openness and authenticity. When we cannot be transparent to protect sensitive or private information, we are transparent about why we are not able to share that information. Our work is not possible without transparency. Partners need a sense of comfort and confidence knowing nothing is hidden.

Value in Action: Willingly share information with peers to advance partnership

OUR STRATEGY

Projects in the Ground

Lancaster is embracing a bias towards action with an emphasis on people and projects. This shows up not only as manure storages, barnyard controls, and soil health practices implemented on farms, but also people doing outreach and project management which all benefit local water quality as well as the farmer's bottom line.

Over 200 stormwater projects have been installed in the last two years alone and include vegetated swales and rain gardens that not only filter runoff but also absorb floodwater and protect vital infrastructure. Floodplain restoration projects provide economic development opportunities, restore wetlands, and reconnect groundwater systems. Hundreds of acres of trees, shrubs, and cover crops increase filtration, purify the groundwater we drink, and protect our community's public health. But the need for more implementation remains and the demand from our community is growing. Funding sources like the CAP Implementation Grant (also known as the Implementation Large Grant through the Lancaster Clean Water Fund) provides flexibility to install the kinds of projects described above that implement the CAP effectively. We need even more implementation support for both projects and people between now and 2025. Below are two examples of strategies that have helped and will continue to help us achieve the CAP.

Chiques Creek. Photo courtesy of Lancaster Clean Water Partners.

Stream Delisting Strategy

The Stream Delisting Strategy focuses implementation efforts in small subwatersheds, or catchments, where restoration can be achieved more quickly. The Partners facilitate partners and align resources to focus outreach and water quality projects within the designated catchment areas, which now total 38 delisting catchments across Lancaster County. The Partners have secured funding for both technical assistance and implementation of best management practices for work within the delisting catchments. Funding sources that are fueling the stream delisting strategy include the Natural Resources Conservation Service (NRCS) Regional Conservation Partnership Program, National Fish and Wildlife Foundation (NFWF) Innovative Nutrient and Sediment Reduction, NFWF Most Effective Basins, and Watershed Renaissance Initiative funding through PA Department of Environmental Protection (DEP) Growing Greener.



Photo courtesy of Lydia Martin.



Sustainable Funding

The Partners continue to lead Lancaster's collective approach to secure sustainable funding sources. Multiple funding opportunities from federal, state, local, private, and corporate sources have grown or taken shape as a result of the CAP, highlighting Lancaster's success when there is a bias towards action. Action requires funding; so the Partners have taken steps such as providing shared language for all to use in grant applications to demonstrate the collective approach. Another step has been to coordinate closely with the Lancaster County Community Foundation to run a locally-driven decision making process within an established organization.

CELEBRATING SUCCESS IN 2023

Places2040 Planning Leadership Awards: Four Plain Sect farmers and partners from public, private, and nonprofit sectors are collaborating to implement practices that improve the health of both their operation and water quality in a small tributary of Pequea Creek in Paradise Township.

Lancaster Watershed Leadership Academy: 12 people from different backgrounds and industries came together to learn to be better stewards, better leaders and better change-makers. 12 months later, they had connected with local leaders, gained unique experiences and are ready for action that makes a difference in their watershed. The 2023 class held its graduation ceremony in December.

Funding: Senator Bob Casey Jr. announced an EPA grant of \$14.3 million for Pennsylvania farmers, Governor Josh Shapiro announced a DEP allocation of \$4 million to Lancaster CAP, and Lancaster Clean Water Fund announced nearly \$65,000 awarded to local initiatives aimed at enhancing Lancaster County's water quality.

Senior Living Community Green Master Plans: Senior Living communities in Lancaster County, like Willow Valley and Woodcrest Villa added employed sustainable landscaping practices like rain gardens and planting native trees and flowers to their complexes. Residents even volunteered to maintain them.

Penn State and Donegal Trout Unlimited Nursery: The Penn State Agriculture and Environment Center and Donegal Trout Unlimited moved their native tree nursery to the Penn State Research Farm, which means more space, automatic and reliable watering, increased volunteer and staff support, improved accessibility for vehicles, and other benefits.

The Nature Conservancy's work in the Cocalico Watershed: The Nature Conservancy teamed up with LandStudies, Inc. and West Cocalico Township and restored 3,867 linear feet of degraded stream channel to as close to historical ecological conditions as possible, removed 18,000 cubic yards of legacy sediment, restored more than eight acres of floodplain, and planted nearly 13 acres of riparian buffer.

Photo courtesy of Lancaster Clean Water Partners.



Amish Liaison Project: Building relationships with the Plain Sect community takes time and trust. A dedicated team of environmentalists continually makes progress in expressing the need for BMPs on local farms.

Fishing Creek Stream Restoration: Friends of Fishing Creek worked with 15 Jeep organizations who enjoy the Fishing Creek Watershed for leisure and recreation. They held an event specifically focused on the local Jeep Clubs with an educational drive on the public dirt road that travels along Fishing Creek for 3.8 miles with three concrete fords.

Indian Spring Run Catchment Council: Work on Indian Run involved removal of a dam to address non-point source pollution and restoring four acres of critical wetland and headwater habitat in a high-quality cold water fishery.

Lititz Run Stream Restoration at Millport Conservancy: Restoration of 6.5 miles of the stream reclassified it from a warm water stream to a cold water stream that now supports a healthy ecology, including trout.

Overlook Forested Buffer and Meadow: Managed by Stroud Water Research Center with contributions from nine other organizations, it is an eight-acre streamside forest and pollinator garden is being created in Lancaster, Pennsylvania, near the Little Conestoga Creek, which is part of the Chesapeake Bay watershed.

Conewago Creek Floodplain and wetlands restoration: A watershed-based approach to fulfill MS4 requirements, reduce local flooding, and improve local water quality in Londonderry Township.

Water Week: In its seventh year, Water Week, managed by Lancaster Conservancy, boasted over 40 events where participants could paddle, explore, volunteer, and take action as a community to protect our streams and rivers for the future!

MS4orum: Managed by the Stormwater Management Team, this annual event was held at Clipper Magazine Stadium and drew 80+ engineers and municipal officials.



HIGHLIGHTS

Our progress towards achieving the CAP in 2022-2023 was fueled by incredible partner organizations operating sometimes in specific watersheds and sometimes across the entire county. The coordinated approach is what led to the scaled up and more efficient success that we experienced, which included better planning and more implementation. These are simply a few highlights of success and in-progress parts of Lancaster's CAP.



Achievements

- Continued building capacity by using the CAP Coordinator Team's strengths and skills,
- Continued to work within and implement the stream delisting strategy, which has already collected useful data for priority work and local demand,
- Documented and shared success stories,
- Published the Resource Inventory, produced by Penn State, of all partner organizations countywide,
- Successfully managed the CAP Implementation Grants.



In-Progress Goals

Identify and secure long-term dedicated funding for CAP implementation

Unprecedented funding increases came from federal, state, private, and corporate sources for both implementation and capacity. The state's first cost share program, the Agriculture Conservation Assistance Program (ACAP), was a huge boost with \$15 million to Lancaster's agriculture sector, while municipally led stormwater work was prioritized for \$3,465,156 American Rescue Plan Act dollars at the local level. However, the need remains to establish sustained sources of funding to ensure long-term success. Work will continue into 2025 with more focus on leveraging dollars and partner expertise to secure funding at the scale that is needed for both implementation and ongoing maintenance.

Use custom tools like the Collaborative Watershed Mapping Tool and the stream delisting app for better collaboration and strategic outreach.

On a regular basis, partners are using the latest version of the Collaborative Watershed Mapping Tool. Version 3.0 was released in 2023 including new layers with disadvantaged communities and/or environmental justice areas from DEP. The stream delisting app is an anchor tool that partners use before and after doing outreach in order to stay closely coordinated. The tool has 673 views, 311 unique users, and 2.7k events since mid December, when version 3.0 was released.

Plant and maintain new acres of riparian buffer every year and bring on the appropriate staff capacity to do so across partner organizations

Our partnership is thankful to have staff dedicated to buffer implementation and maintenance. The Buffer Action Team (BAT) and technical service providers have been hard at work planting riparian forest buffers across the county. During the 2021 planting seasons, the BAT estimates planting about 120 new acres of buffers and through the Buffer Establishment Support Team (BEST), the Partners maintained 32 acres of new buffers for two years. There is still unmet demand from landowners for more buffers and maintenance especially after intense weather events, and we need to keep that pipeline of projects flowing. Work to continue in 2025 by driving the expanded awareness and implementation of riparian buffers through scaled up public outreach efforts, larger maintenance program, and accurate tracking system.

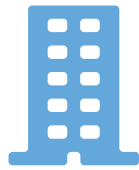
PRIORITY INITIATIVES

The Countywide Action Plan was originally developed in 2018 through a significant and collaborative grassroots approach with local partner organizations, experts, community members, and state agencies. Now, with nearly six years of implementation efforts, this revised version of the plan emphasizes Lancaster's progress, as well as lessons learned and new strategies to meet our reduction goals by 2025. Numeric goals per practice were updated in 2023.

The CAP is centered around the following priority initiatives:



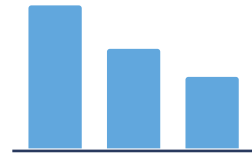
Agriculture



Developed



Natural



**Data management
and monitoring**

Photo courtesy of Lancaster Clean Water Partners.





Agriculture

The agricultural sector will require significant people and projects with implementation as the key driving factor in achieving long-term pollution reductions. Agricultural BMPs are captured by this initiative.

Challenges

- Farmer buy-in or resistance,
- Implementation funding is still needed,
- Conservation Plan capture and long-term verification processes,
- Increase in extreme weather events,
- Data gap from planners/farmers to brokers to state,
- Limited technical assistance and engineering services/resources.



*Photo courtesy
of Lancaster
Farmland Trust.*

2023 Updates

- Agriculture Conservation Assistance Program (ACAP), CAP, and RCPP funding brought unprecedented financial support.
- A new Data Coordinator and a Verification Coordinator at the Conservation District led to better tracking of BMPs. Both positions coordinate efforts closely with multiple partner organizations for strategic work.
- 121,000 acres have been captured into Practice Keeper (roughly 50% of Lancaster County farms), with the acreage increasing monthly.
- In 2023, the Metrics Analysis revealed that many existing buffers needed documentation, helped the team set more realistic targets for livestock access management, noted significant underreported acreage of grass buffers with exclusion fencing, and finalized efforts to reconcile these identified needs.
- A Soil Health Learning Group is under development (led by the Alliance for the Chesapeake Bay and PA Soil Coalition) for 2024.
- The Amish Liaison Program was launched in delisting catchments in the Octoraro Watershed.

Agricultural BMPs

	Total Actual Implementation	Target	Description
Soil Conservation and Water Quality Plans (total acres)	165,994	176,792	Plans are a combination of agronomic, management and engineered practices that protect and improve soil productivity and water quality, and to prevent deterioration of natural resources on all or part of a farm. Plans must
Barnyard Runoff Controls (total acres)	1,025	1,025	This includes practices such as roof runoff control, diversion of clean water from entering the barnyard and control of runoff from barnyard areas

	Total Actual Implementation	Target	Description
High Residue Tillage (total acres)	95,000	99,528	A conservation tillage routine that involves the planting, growing and harvesting of crops with minimal disturbance to the soil in an effort to maintain at least 60 percent crop residue coverage immediately after planting each crop.
Conservation Tillage (total acres)	59,000	59,296	A conservation tillage routine that involves the planting, growing and harvesting of crops with minimal disturbance to the soil in an effort to maintain 30 to 59 percent crop residue coverage immediately after planting each crop.
Cover Crop (total acres)	3,000	3,545	A short-term crop grown after the main cropping season to reduce nutrient losses to ground and surface water by sequestering nutrients. This type of cover crop may not receive nutrients in the fall, and may not be harvested in the spring.
Traditional Cover Crop with Fall Nutrients (total acres)	105,000	115,538	A short-term crop grown after the main cropping season to reduce nutrient losses to ground and surface water by sequestering nutrients. This type of cover crop is planted upon cropland where manure is applied following the harvest of a summer crop and prior to cover crop planting. The crop may not be harvested in the spring.
Commodity Cover Crops (total acres)	15,000	17,775	A winter cereal crop planted for harvest in the spring which does not receive nutrient applications in the fall. Any winter cereal crop which did receive applications in the fall is not eligible for nutrient reductions.
Prescribed Grazing (total acres)	8,000	9,116	This practice utilizes a range of pasture management and grazing techniques to improve the quality and quantity of the forages grown on pastures and reduce the impact of animal travel lanes, animal concentration areas or other degraded areas.
Pasture Alternative Watering (total acres)	7,200	7,835	An alternative drinking water source, such as permanent or portable livestock water troughs placed away from the stream corridor. Implementing off-stream shade for livestock is encouraged where applicable. The water supplied to the facilities can be from any source, including pipelines, spring developments, water wells and ponds. In-stream watering facilities, such as stream crossings or access points, are not considered in this definition.
Livestock and Poultry Waste Management Systems (total animal units)	500,000	535,220	Any structure designed for collection, transfer and storage of manures and associated wastes generated from the confined portion of animal operations and complies with NRCS 313 (Waste Storage Facility) or NRCS 359 (Waste Treatment Lagoon) practice standards. Manure conserved through reduced storage and handling losses associated with implementation are available for land application or export from the farm.
Manure Incorporation (total acres)	70	76	Manure is incorporated into the soil within a certain timeframe after application, and is dependent on level of soil disturbance (high vs. low).
Loafing Lot Management (total acres)	100	90	The stabilization of areas frequently and intensively used by people, animals or vehicles by establishing vegetative cover, surfacing with suitable materials, and/or installing needed structures. This does not include poultry pad installation.
Land Retirement to Pasture (total acres)	325	342	Converts land area to pasture. Agricultural land retirement takes marginal and highly erosive cropland out of production by planting permanent vegetative cover such as shrubs, grasses, and/or trees. Agricultural agencies have a program to assist farmers in land retirement procedures.

	Total Actual Implementation	Target	Description
Land Retirement to Open Space (total acres)	3,400	3,381	Converts land area to hay without nutrients. Agricultural land retirement takes marginal and highly erosive cropland out of production by planting permanent vegetative cover such as shrubs, grasses and/or trees.
Nutrient Application Management - Core Nitrogen (total acres)	100,000	109,268	Applications of nitrogen are made in accordance with certain elements as applicable (e.g. land-grant university recommendations, spreader calibration, manure analysis, etc.)
Nutrient Application Management - Core Phosphorus (total acres)	100,000	119,962	Applications of phosphorus are made in accordance with certain elements as applicable (e.g. land-grant university recommendations, spreader calibration, manure analysis, etc.)
Nutrient Application Management - Rate - Nitrogen (total acres)	18,739	20,613	Applications of nitrogen are made in accordance to all elements of the Nitrogen Core practice and an additional element from a list of options (e.g. Nitrogen applications are made using variable rate goals)
Nutrient Application Management - Rate - Phosphorus (total acres)	31,291	34,420	Applications of phosphorus are made in accordance to all elements of the Phosphorus Core practice and an additional element from a list of options (e.g. Phosphorus applications are made using variable rate goals)
Nutrient Application Management - Placement - Nitrogen (total acres)	34,409	37,850	Applications of nitrogen are made in accordance to all elements of the Nitrogen Core practice and an additional element from a list of options (e.g. Applications of inorganic nitrogen are injected into the subsurface or incorporated into the soil)
Nutrient Application Management - Placement - Phosphorus (total acres)	57,797	63,577	Applications of phosphorus are made in accordance to all elements of the Phosphorus Core practice and an additional element from a list of options (e.g. Applications of inorganic phosphorus are injected into the subsurface or incorporated into the soil)
Nutrient Application Management - Timing - Nitrogen (total acres)	5,714	6,286	Applications of nitrogen are made in accordance to all elements of the Nitrogen Core practice, and are split across the growing season into multiple applications
Nutrient Application Management - Timing - Phosphorus (total acres)	42,793	47,073	Applications of phosphorus are made in accordance to all elements of the Phosphorus Core practice, and are split across the growing season into multiple applications
Forest Buffers on Fenced Pasture Corridor (total acres in buffer)	1,200	1,400	Linear wooded areas that help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater. The recommended buffer width is 100 feet, with a 35 feet minimum width required. When buffers are implemented along a pasture exclusion fencing is installed to prevent livestock from grazing and trampling the buffer or entering the stream.
Narrow Forest Buffers on Fenced Pasture Corridor (total acres in buffer)	85	101	Linear wooded areas that help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater. Narrow forest buffer strips are between 10 and 35 feet in width. When buffers are implemented along a pasture exclusion fencing is installed to prevent livestock from grazing and trampling the buffer or entering the stream.

	Total Actual Implementation	Target	Description
Grass Buffers on Fenced Pasture Corridor (total acres in buffer)	100	176	Linear strips of grass or other non-woody vegetation with fencing installed to prevent livestock from grazing and trampling the buffer or entering the stream and is maintained to help filter nutrients, sediment and other pollutants from runoff. The recommended buffer width for buffers is 100 feet, with a 35 feet minimum width required. When buffers are implemented along a pasture exclusion fencing is installed to prevent livestock from grazing and trampling the buffer or entering the stream.
Narrow Grass Buffers on Fenced Pasture Corridor (total acres in buffer)	225	318	Linear strips of grass or other non-woody vegetation with fencing installed to prevent livestock from grazing and trampling the buffer or entering the stream and is maintained to help filter nutrients, sediment and other pollutants from runoff. Narrow grass buffers are between 10 and 35 feet in width. When buffers are implemented along a pasture exclusion fencing is installed to prevent livestock from grazing and trampling the buffer or entering the stream.
Tree Planting (total acres)	875	855	Includes any trees planted on agricultural land, except those used to establish riparian forest buffers, targeting lands that are highly erodible or identified as critical resource areas

Photo courtesy of Lancaster Farmland Trust.





Developed

Lancaster County includes urban/suburban, rural, forested, industrial/commercial, and open spaces not related to agricultural operations.

Challenges

- General public and municipal hesitancy to use resources above and beyond permit requirements,
- BMP implementation and maintenance funding,
- Local landowner willingness to participate (private land BMP implementation),
- Project tracking, reporting, and verification (limited staffing to review and approve),
- Increased % of new dwellings in Urban Growth Areas (UGAs) to accommodate projected population ,
- Programmatic inconsistencies across a diverse set of municipalities,
- Permit specifics and limits to project scope/geography,
- Expense per pound for gray infrastructure upgrades,
- Climate change and storm intensity.



Ephrata Borough Gross Run. Photo courtesy of Lancaster Clean Water Partners.

2023 Updates

- An application for an update of the countywide Act 167 Plan was spearheaded by the Lancaster County Planning Department (LCPD) and approved by the County Commissioners.
- Outreach efforts and communications with several municipalities have led to municipalities considering the overall health of a watershed and/or stream system in lieu of simply meeting Municipal Separate Storm Sewer System (MS4) permit obligations.
- Significant stream and floodplain restoration projects have been completed or are underway.
- A significant number of municipalities are participating in watershed-scale planning efforts
- Water infrastructure was the top use of ARPA funding by municipalities (LNP article).

2023 Lancaster Clean Water Week. Photo courtesy of Michelle Johnsen/Lancaster Conservancy.



	Total Actual Implementation	Target	Description
Urban Forest Buffers (total acres)	175	205	Linear wooded areas that help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater. The recommended buffer width is 100 feet, with a 35 feet minimum width required.
Urban Grass Buffers (total acres in buffers)	30	45	Linear wooded areas that help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater. The recommended buffer width is 100 feet, with a 35 feet minimum width required.
Urban Tree Planting (total acres)	32	36	Includes any trees planted urban land, except those used to establish riparian forest buffers, targeting lands that are highly erodible or identified as critical resource areas.
Urban Forest Planting (total acres)	24	31	Tree planting projects in urban or suburban areas that are not part of a riparian buffer, structural BMP or Urban Tree Canopy Expansion BMP, with the intent of establishing forest ecosystem processes and function. This requires urban forest plantings to be documented in a planting and maintenance plan that meets state planting density and associated standards for establishing forest conditions, including no fertilization and minimal mowing as needed to aid tree and understory establishment.
Impervious Surface Reduction (total acres)	58	58	Reducing impervious surfaces to promote infiltration and percolation of stormwater runoff.
Urban Nutrient Management (total acres)	10,577	10,577	The proper management of major nutrients for turf and landscape plants on a property to best protect water quality.
Urban Stream Restoration (total linear feet)	35,000	45,740	Refers to any Natural Channel Design (NCD), Regenerative Stream Channel (RSC), Legacy Sediment Removal (LSR), or other restoration project in an urban/ suburban environment that meets the qualifying conditions for credits, including environmental limitations and stream functional improvements.
Storm Drain Cleanout (lbs of sediment)	29,610	29,610	Mechanical (or similar) removal of collected sediment and debris in storm sewer systems.
Street Sweeping (total acres)	155	155	Street cleaning practices through mechanical broom technology, vacuum assisted sweepers, regenerative air sweepers, or an advanced technology demonstrating greater abilities to remove solids and finer particles from street surfaces.
Grey Infrastructure Nutrient Discovery Program (acres treated)	23,772	23,772	A local program to detect and eliminate illicit discharges from the storm drain system, mandated as one of the six minimum stormwater control measures that must be addressed by communities regulated under Phase 1 or Phase 2 MS4 NPDES stormwater permits. Illicit discharge detection and elimination credits are only available to localities that show empirical monitoring for each eligible individual discharge
Wet Ponds and Wetlands (total acres treated)	700	706	A water impoundment structure that intercepts stormwater runoff then releases it to an open water system at a specified flow rate. These structures retain a permanent pool and usually have retention times sufficient to allow settlement of some portion of the intercepted sediments and attached nutrients/ toxics. There is little or no vegetation living within the pooled area. Outfalls are not directed through vegetated areas prior to open water release.

	Total Actual Implementation	Target	Description
Stormwater Treatment Performance Standard (total acres treated)	7,000	7,152	Stormwater practices applied to post-development runoff that employ a permanent pool, constructed wetlands or sand filters.
Runoff Reduction Performance Standard (total acres treated)	33,000	35,762	Stormwater practices applied to post-development runoff that employ a permanent pool, constructed wetlands or sand filters.
Urban Filter Strips (total acres treated)	14	14	Practices that capture and temporarily store runoff and pass it through a filter bed of either sand or an organic media.
Infiltration Practices (total acres treated)	1,500	1,784	Infiltration practices utilize porous materials to facilitate infiltration of stormwater into soils.
Filtering Practices (total acres treated)	130	148	Practices that capture and temporarily store runoff and pass it through a filter bed of either sand or an organic media. There are various sand filter designs, such as above ground, below ground, perimeter, etc. An organic media filter uses another medium besides sand to enhance pollutant removal for many compounds due to the increased cation exchange capacity achieved by increasing the organic matter.
Bioretention (total acres treated)	900	955	An excavated pit backfilled with engineered media, topsoil, mulch, and vegetation. These are planting areas installed in shallow basins in which the storm water runoff is temporarily ponded and then treated by filtering through the bed components, and through biological and biochemical reactions within the soil matrix and around the root zones of the plants.
Bioswale (total acres treated)	3,200	3,455	Channels designed to concentrate and convey stormwater runoff while removing debris and pollution. Bioswales can also be beneficial in recharging groundwater.
Vegetated Open Channels (total acres treated)	432	1,257	Open channels that convey stormwater runoff and provide treatment as the water is conveyed. Runoff passes through either vegetation in the channel, subsoil matrix, and/or is infiltrated into the underlying soils.
Dry Ponds (total acres treated)	2,000	2,444	Dry ponds control peak flows of runoff, help improve water quality and lessen the effects of erosion. Between rain events, a dry pond looks like a large, grassy low area. When it rains, the pond fills with water. They hold water for 48-72 hours to allow sediment and pollutants to settle out.
Extended Dry Ponds (total acres treated)	9,100	9,602	Dry Detention Ponds are depressions or basins created by excavation or berm construction that temporarily store runoff and release it slowly via surface flow or groundwater infiltration following storms.
Vegetated Open Channel (total acres treated)	1,000	1,257	Modeled the same as grass buffers in the Chesapeake Assessment Scenario Tool

	Total Actual Implementation	Target	Description
Permeable Pavement (total acres treated)	8.3	8.3	Pavement or pavers that reduce runoff volume and treat water quality through both infiltration and filtration mechanisms.
Conservation Landscaping Practices (total acres treated)	100	125	Areas of managed turf that are converted into perennial meadows using species that are native to the Chesapeake Bay region.
Septic Connections (number of systems)	365	365	This is when septic systems get converted to public sewer and are connected to a wastewater treatment plant.
Septic Pumpout (number of systems)	2,500	2,500	Septic systems achieve nutrient reductions through several types of management practices, including frequent maintenance and pumping. On average, septic tanks need to be pumped once every three to five years to maintain effectiveness. The pumping of septic tanks is one of several measures that can be implemented to protect soil absorption systems from failure.

Photo courtesy of Carly Siege/Chesapeake Bay Program.





Natural

Riparian forest and grass buffers provide habitat, serve as flood protection, and filter water before it enters streams and rivers. BMPs from this Priority Initiative are extremely important to reaching our nutrient and sediment reduction goals. Efforts listed here will be managed by the Buffer Action Team, which implements new and maintains existing buffers and documents progress towards the county's 8,655 total acres goal.

Challenges

- Climate change and storm intensity,
- Public buy-in and extent of local landowner willingness to participate,
- Not enough boots on the ground for outreach, implementation, and maintenance,
- More BMP implementation funding is needed,
- Ongoing maintenance support,
- Culturally appropriate outreach to the Plain Sect community.

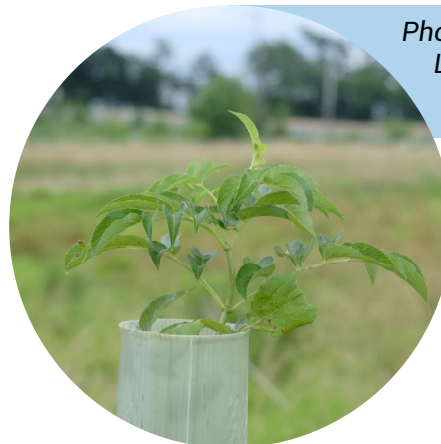


Photo courtesy of
Lancaster Clean Water
Partners.

2023 Updates

- Buffer awareness efforts have expanded from initial Water Week events.
- The delisting strategy continues to drive locations of primary efforts, with support in the form of technical and financial assistance.
- The BEST program is operational and the Buffers Action Team is exploring and testing approaches to streamline and maximize the success of the program.
- The Buffer Action Team identified four priorities for the upcoming years: 1) remove barriers to efficient landowner outreach, 2) advance outreach initiatives to potential landowners, 3) provide prompt responses and implementation of projects to newly interested landowners, and 4) streamline and fully utilize the buffer maintenance BEST program.
- Although still a significant challenge, capacity has been growing annually.

Riparian Buffer BMPs

	Total Actual Implementation	Target	Description
Forest Buffers (total acres in buffer)	2,200	2,250	Linear wooded areas that help filter nutrients, sediments and other pollutants from runoff as well as remove nutrients from groundwater. The recommended buffer width is 100 feet, with a 35 feet minimum width required.
Narrow Forest Buffers (total acres in buffer)	275	285	Linear strips of wooded areas maintained on agricultural land between the edge of fields and streams, rivers or tidal waters that help filter nutrients, sediment and other pollutants from runoff. Narrow forest buffer strips are between 10 and 35 feet in width.
Grass Buffers (total acres in buffer)	6,700	6,780	Linear strips of grass or other non-woody vegetation maintained to help filter nutrients, sediment and other pollutants from runoff. The recommended buffer width for buffers is 100

	Total Actual Implementation	Target	Description
Narrow Grass Buffers (total acres in buffer)	400	415	Linear strips of grass or other non-woody vegetation maintained on agricultural land between the edge of fields and streams, rivers or tidal waters that help filter nutrients, sediment and other pollutants from runoff. Narrow grass buffers are between 10 and 35 feet in width.
Non-urban Stream Restoration (total linear feet)	131,948	138,948	Also known as agricultural stream restoration, creates natural channel design, legacy sediment removal, regenerative stream channel or regenerative stormwater conveyance (wet channel only)
Wetland Restoration (total acres)	200	396	The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former wetland.
Wetland Creation (total acres)	36	56	The manipulation of the physical, chemical, or biological characteristics present to develop a wetland that did not previously exist at a site.
Wetland Rehabilitation (total acres)	23	32	The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded wetland.

"Lancaster County has demonstrated tremendous success through collaboration and strategic, data-driven investments to clean up their local waters."

- Jill Whitcomb, PA Department of Environmental Protection

Data Management and Monitoring

The Data Management and Monitoring Priority Initiative is prioritizing the collective effort to develop a shared measurement system with access for multiple sources of data. A current focus area has been assembling water quality monitoring data, planning data, and other information from multiple agencies, in both tabular and spatial formats. The Metrics Analysis in 2023 gave us better accuracy and more precise goals moving forward.

Challenges

- Funding for equipment, analyses, staff support, equipment maintenance, etc.,
- Not all partners, agencies, etc. are ready or allowed to share data,
- Combining modeled, monitored, and mapped data is difficult but necessary to show the collective progress in a digestible format.



Stream sampling team.
Photo courtesy of
Kenn Bennett,
Lancaster Clean
Water Partners.

2023 Updates

- United States Geological Survey water quality monitoring trends show a 33% improvement with a decrease in nitrogen loading rates from 1985-2020 on the Susquehanna River.
- The Conservation District implemented ten water quality monitoring stations in the Conestoga and Pequea watersheds to complement existing SRBC water quality monitoring stations.
- The Octoraro Watershed Association continues to roll out its comprehensive water quality modeling tool to assist with decision points for BMP implementation and assess improvements in the Octoraro watershed.
- CSDatum was modified to allow data entry of water quality monitoring results from municipal and non-municipal users and partners. It was also used to help shape the state's e-reporting for developed BMPs by municipalities.
- The Collaborative Watershed Mapping Tool (version 3.0) is up and running. The tool is a public-interfacing platform and tool to guide any partner organization in their conservation decision making efforts. The separate delisting application has a map for catchment leads and delisting strategy tracking.

There are no BMPs for implementation captured by this initiative.

Benthic invertebrate sampling. Photo courtesy of
Allyson Gibson/Lancaster Clean Water Partners.



REFLECTIONS

Challenges

Acknowledging that “change can be disruptive, challenging, and exciting,” Lancaster has and will continue to tackle challenges to see local as well as downstream water quality improvements.

- Such a large nitrogen and phosphorus reduction goal can be overwhelming.
- An agency-owned data reporting process that provides results 12-18 months after. Without sufficient data of current implementation rates or locations, strategic outreach and project selection suffers.
- While unprecedented levels of funding came through the ACAP in 2022/23, a limited state budget raises concerns about the sustainability of funding avenues for conservation work going forward.
- Because each situation, region, and landowner’s needs are different, determining ways to engage the non-regulated community can be challenging.
- Extreme weather, like 1,000-year storm events, impacted project sustainability and budgets.
- Dam removals and breaches that are not part of planned restoration projects contribute hundreds of thousands of pounds of unplanned sediment and nutrients flowing downstream.
- Limited engineering and technical expertise for agricultural projects in particular.
- Strict compliance requirements for federal funding can strain efficiency and limit access for certain groups.
- Verification of thousands of existing practices to accurately tell our story.

Successes & Opportunities

Fertilizer legislation approval: A large portion of our phosphorus reductions are tied to the fertilizer legislation which will limit urban and suburban nutrient application. This legislation has been proposed for over 10 years, and was approved in 2023. It will now require specific application rates that help us meet clean water goals.

Increased funding: Multiple funding opportunities have grown or taken shape as a result of the CAP and Lancaster’s leadership plus high demand for conservation fueled by local outreach. Lancaster’s partner organizations, with the leadership of the Conservation District, have allocated almost \$15 million in 15 months from the state’s first agricultural cost share program.

Verification process for BMP implementation: The goal of BMP Verification is to act as a form of quality control for the conservation practices applied on Lancaster’s farms. By inspecting practices to determine if they are functional years after installation, it ensures that the data being fed into the Chesapeake Bay Model is updated and accurate. We get a clearer picture of the pollution reduction occurring in the county, as the program collects data on BMPs that were never inspected or not inspected frequently enough to maintain credit in the Model, or were installed on smaller farms not regularly visited from Act 38. This showcases the commitment made by farmers and the Conservation District to improve local stream health for the community and the Chesapeake Bay.

Expand local water quality monitoring: Alignment of parameters, equipment, processes, etc. is happening and needs additional support to ensure we are measuring water quality improvements across sectors and areas as well as connecting our work with established data experts. A Metrics Analysis in 2023 gave us a better understanding of the modeled, monitoring, and mapped projects

that are both completed and need to be completed. This is a huge area of opportunity so partners can make better decisions of where to work next.

Funding and capacity support for the Act 167 plan: State dollars were awarded to Lancaster County Planning Department to accomplish Phase 1 of writing a new Act 167 plan. This will get us closer to consistent stormwater language, ordinances, data, and resources so municipalities can take action more efficiently. The Lancaster Clean Water Partners are coming alongside to engage municipalities and ensure this is a tool created to be truly useful. Phase 2 funding will be available in summer 2024.

Continued support and leadership from the Department of Environmental Protection, PA's Chesapeake Bay Program Office, and the Environmental Protection Agency: Thank you for the opportunity to work together and provide feedback in both directions.

"I asked myself why we were putting stormwater runoff directly into the headwaters of a stream. By treating that runoff, we would be able to enhance the stream, make use of some underutilized property, and then add educational and recreational opportunities for township residents to enjoy."
– Dwayne Steager, West Hempfield Township

Photo courtesy of Lancaster Clean Water Partners.



GET IN TOUCH

Online Resources

Lancaster CAP lancastercleanwaterpartners.com/countywide-action-plan

Lancaster Farm Trust LancasterFarmlandTrust.org

LandStudies Landstudies.com

Lancaster County Conservation District LancasterConservation.org

David Miller/Associates, Inc. dmai.com

Lancaster Clean Water Partners <https://lancastercleanwaterpartners.com/>

CAP Coordinator Support

Allyson Gibson

agibson@lancastercleanwaterpartners.com

Matt Kofroth

mattkofroth@lancasterconservation.org

Mike LaSala

mike@landstudies.com



**Learn more about
CAPs from PA's
Department of
Environmental
Protection**

Photo courtesy of Lancaster Clean Water Partners.



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Photo courtesy of Lancaster Clean Water Partners.



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