HRG
Herbert, Rowland & Grubic, Inc.
Engineering & Related Services
AN EMPLOYEE-OWNED COMPANY

NORTHUMBERLAND COUNTY COUNTYWIDE ACTION PLAN

Submitted to:
NORTHUMBERLAND COUNTY
CONSERVATION DISTRICT
ATTN: Mr. Nathan Brophy
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TABLE OF CONTENTS

Stakeholders Involved with the Northumberland Countywide Action Plan

The Planning Team

Northumberland County Conservation District

County of Northumberland

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The Partners

Chesapeake Bay Foundation
Saving a National Treasure

Merrill W. Linn Land & Waterways Conservancy

PennState Extension

Northcentral Pennsylvania Conservancy

Trout Unlimited PA Council

Shamokin Creek Restoration Alliance
SCRA

Chesapeake Conservancy
Explore. Conserve. Innovate.

AOAA Trails

DCNR

SEDA COG

Pennsylvania Farm Bureau

Pennsylvania Fish & Boat Commission

USDA

Middle Susquehanna Riverkeeper Association, Inc

ALLARM
Alliance for Aquatic Resource Monitoring
est. 1986

Central Keystone Council of Governments

Thank you to all stakeholders who provided comments and feedback throughout the development process!

Northumberland County Executive Overview

Plan Highlights

Northumberland County was asked by the Department of Environmental Protection (PADEP) to participate in the Chesapeake Bay cleanup effort and develop a Countywide Action Plans (CAP) to reduce nutrients and sediment in local waterways. The Northumberland CAP provides a countywide strategy to achieve local clean water goals. The initiatives outlined in the plan will protect natural resources, promote agriculture sustainability, and increase conservation efforts. Local conservation efforts will benefit local communities throughout Northumberland County while assisting Pennsylvania with meeting its Chesapeake Bay requirements.

Northumberland County encompasses over 470 square miles of land and 9,500 miles of stream that all drain to the Chesapeake Bay. This land is represented by roughly 56% natural or forested land, 31% agricultural land, and 13% developed or urban land. Nutrients and sediment are generated from agricultural and developed lands, so roughly 44% of the land are the focus in the CAP. Of the 950 stream miles approximately 39% of the county's streams are impaired, with much of the impairment coming from Acid Mine Drainage (AMD). All these factors play into how much nutrients and sediment enter the Chesapeake Bay from the Northumberland County. PADEP estimated that in 2019 the Northumberland County was contributing 5.3 million pounds of nitrogen and 254 thousand pounds of phosphorus to local waterways on an annual basis. By 2025, the county is looking to reduce 1.73 million pounds of nitrogen and 48 thousand pounds of phosphorus. The table below shows modeled estimates for pollutants in 1985 and 2019 along with the 2025 state goals for Northumberland County.

Year	Nitrogen (pounds/year) delivered to Northumberland County waterways	Phosphorus (pounds/year) delivered to Northumberland County waterways
1985	5,819,000	429,000
2019	5,289,000	254,000
2025 Goal	3,555,000	206,000
Reduction Target	*1,734,000*	*48,000*

To achieve the goals outlined above, the Northumberland County CAP identifies priority initiatives and actions that support the county's goal of protecting healthy streams and rivers while restoring waterways that need additional help. The CAP includes four priority initiatives that are broken into actions items with manageable and measurable goals. These action items will evolve over time based upon early plan implementation successes and changes in local priorities.

Goals of the Countywide Action Plan

Chesapeake Bay watershed goals are focused on reducing three primary pollutants: nitrogen, phosphorus, and sediment. Municipalities have played a significant role in achieving these goals over the past two decades through wastewater treatment advances and urban stormwater management. Since wastewater treatment and urban stormwater management support our water quality goals, the CAP implementation team will work with municipalities and authorities who lead these programs to support and leverage their efforts where possible.

Agricultural lands present another opportunity to reach County clean water goals. Where not managed properly, agricultural land releases nutrients and sediment into local waterways similar to other land uses. Many goals in Priority Initiative #3 focus on determining what steps local farmers can take to reduce the amount of nutrients and sediment reaching local waterways, in addition to identifying necessary funding and technical support to assist the community.

Key Findings

The Northumberland County Planning Team connected with over 20 stakeholders from across the county. A few common themes were identified through these discussions that informed the development of the CAP. Below are the themes identified by various stakeholders:

- Northumberland County is a community of action! Many individuals and organizations are already taking steps to clean up local waterways. The CAP can help by fostering new connections and leveraging resources to reach common goals (water quality and otherwise).
- Monitoring water quality matters. The county must continue to monitor water quality to ensure management actions are working and to geographically focus efforts to the most impaired watersheds. Expanded assessment by PADEP in areas that have not been fully assessed will assist the county with long-term water quality improvement/protection.
- Technical assistance and funding are keys to success. Unfortunately, many existing clean water initiatives in the county have been slowed or stalled due to a lack of timely technical and financial resources when landowners are ready to go. To ramp up existing projects and start new ones, new funding streams are critical. The implementation team is working to identify actionable solutions from across the public and private sectors.

Opportunities for Success

Many opportunities for success in Northumberland County came out of CAP planning sessions and meetings with stakeholders. Some successful efforts can be recognized in the short term, with others taking longer to achieve results. Below are some success stories the Northumberland County CAP can achieve.

Short Term:

- Apply for funding to implement a cover crop incentive program that would benefit farmers in each county.
- Develop a communication strategy to communicate consistent water quality goals and engage more landowners and farmers.
- Engage landowners willing to implement projects to begin funding applications.

- Continue to conduct farm visits to engage and educate landowners, while identifying new project opportunities

Long Term:

- Set-up a county technical assistance program to serve the needs of farmers and landowners.
- Establish a program to rapidly delist catchments partnering with the Chesapeake Conservancy.
- Work with over 200 new farmers to write and develop conservation and nutrient management plans.
- Identify some private funding sources that may be able to supplement public funding sources/existing sources utilized for stakeholders.
- Work with AMD impaired streams to address cause of impairment and improve nutrient and sediment runoff in conjunction.
- Partner with municipalities and CSO's to address nutrient and sediment concerns.

Challenges to Implementation

The CAP presents many challenges to implementation that, if not addressed, will become hurdles to being successful, especially by the 2025 deadline. Each action item has challenges, many of which are regulatory, tied to a State program, or a general long-standing conservation challenge. Paired with the challenge column in the planning template, the programmatic recommendations template suggests solutions to overcome many of the identified challenges. The following challenges are common topics throughout many of the action items and, if not addressed, will stall progress.

Funding: The Northumberland County CAP is estimated to cost approximately $89 million over the next five years to implement. County governments and local municipalities cannot cover the required funding for implementation. Local government entities struggle to cover the cost of delivering their required services as it is. State and Federal funding is available; however, not to the extent to support the required amounts for implementation. Applying for funding, securing funding contracts, and reporting on the spending is a time-consuming process. Similarly, each program has its nuances which confuses landowners and challenges practitioners who are better suited to work through technical challenges rather than financial/legal challenges. To efficiently scale up county CAP implementation efforts, grants must be consolidated, and funders must be willing to increase funds and support staff to meet local implementation needs by 2025. Accelerated contracting timelines will result in more predictable implementation schedules.

People: The Northumberland County CAP proposes over 25 new positions to assist with implementation efforts. Current staffing capacity is limited at county governments and organizations devoted to implementation efforts. Staff are required to complete many outside job duties in addition to CAP-related efforts. Engineering and technical assistance at Conservation Districts and other respective entities is limited with backlogs extending months and years. To be successful, the Northumberland County CAP identified 25 additional positions in the private and public sector to overcome technical assistance and engineering deficits, in addition to needed coordination at county governments. Should human capital funding be developed, this is an opportunity to get more people interested in a career in conservation,

including science/technology/engineering/math (STEM), communications, data management, project management, policy, planning, and other related disciplines.

Landowner Buy-in: One of the biggest challenges in implementing the CAP is that, beyond basic regulatory requirements and government oversight, landowner participation in clean water improvements on their property is voluntary. Faced with competing priorities for their land and the fact that best management practices may have significant associated costs for installation and maintenance, landowners may opt not to pursue them. Removing productive cropland out of production is another challenging constraint when proposing to implement conservation practices. In order to overcome these challenges, incentive payments and market-driven outcomes must be an option for implementation.

Permitting: Many of the projects proposed in the CAP require engineering, design and regulatory permitting (Chapter 102, 105, 106, Section 404, Act 38, etc.). Understaffing at the PADEP regional office level causes an impact on permitting timelines, which delays construction. To achieve the 2025 timeline, projects must be approved for permitting in short order to ensure bidding and construction can proceed in a timely manner. If permit application submittals need to be of higher quality to accelerate processing, training should be provided to practitioners.

Reporting and Tracking: All projects implemented as part of the CAP must be reported to State and Federal agencies to count toward reduction goals. Many projects are privately funded by landowners and do not get reported. Locating and reporting projects that do not receive State or Federal funding, or are part of another regulatory reporting avenue, is challenging with available technologies and data sharing constraints. As a result, many projects continue to go unreported, and farmers aren't getting recognition for their conservation efforts. The current system of one-on-one farms visits to catch up on best management practice (BMP) reporting takes a long time, and reverification of reported practices continues to lag. Verification of projects once a project reaches its credited lifespan is challenging with each passing year as more and more projects lose credit and are not being re-reported until a Conservation District staff person performs a site visit. Overall, State and Federal program-related reporting also lags, and direct environmental monitoring may not yield actual water quality improvements for years, so in today's strategic environment, decisionmakers at the local level never have a clear picture of where conservation efforts are needed the most. Projects continue to proceed on a one-off pace, which is not what a scaled-up implementation strategy looks like. To overcome this issue, technology must be developed to easily identify and credit projects from aerial imaging so that local strategies can be more effective and reporting practices continue to improve.

Additional challenges are listed withing the CAP planning template; however, these are the common themes that arise. Despite these challenges, local stakeholders are motivated to make real progress, and have suggested innovative ways to overcome the challenges. State and Federal partners are critical to helping stakeholders overcome these challenges and push forward with implementation.

Executive Summary

The Northumberland County CAP focuses implementation across four (4) priority initiatives that will result in water quality improvements: 1) County programmatic initiatives, 2) reporting and tracking, 3) achieving new pollutant reductions – numeric goals, and 4) research, education, and training. Each of these priority initiatives is broken down into action items that result in improvements to water quality. The CAP establishes a countywide framework to guide implementation partners and county teams on how to be strategically successful in restoring and protecting water quality. Finalization of the CAP is the beginning of a multiyear implementation effort that will adapt over time. Additional funding and resources are critical components to the CAP success and are detailed in each action item.

Priority Initiative 1: County Programmatic Initiatives

Priority Initiative 1 of the Northumberland County CAP includes programmatic initiatives that support or identify water quality goals that are already in progress within the county or are planned to be implemented by 2025. County programmatic initiatives include action items such as Comprehensive Plan implementation steps, Hazard Mitigation Plan implementation, Agricultural Preservation Program enhancements, University partnerships, communication plans, website development, and others. These initiatives are primarily coordinated by county government leads with support from local partners on implementation. County programmatic initiatives include many co-benefits that result in additional achievements outside of typical water quality improvements. Below are the top five (5) action items listed in the County Programmatic Initiatives section of the CAP.

- Action 1.1A/B Implement County Comprehensive Plan policies and actions
    - Conserve 1,800 acres of forest and 70 acres of wetland through 2025
    - Promote conservation of natural resources and increase recreational opportunities
    - Increase implementation and preservation of riparian forest buffers
- Action 1.5 Work with Anthracite Outdoor Adventure Area (AOAA)
    - Work with 6,500 acres to conserve, implement BMPs, implement AMD and recreational activities
- Action 1.6 Continue to Implement County Farmland Preservation Programs
    - Preserve 9,104 acres of farmland by 2025, secure additional funding to support goals
- Action 1.7 Establish Funding to Support the Agricultural Community
    - Work with 200 farms by 2025 to ensure they follow required agricultural conservation and nutrient management plans

- Action 1.9 A/B Create a County Water Quality Communications Plan
    - Develop a communications plan leveraging existing plans and organizations to ensure one consistent water quality message
    - Develop an agricultural outreach strategy to engage farmers and landowners efficiently and effectively

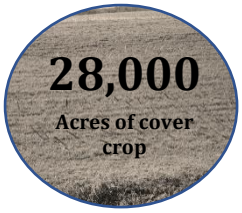
Priority Initiative 2: Reporting and Tracking

Priority Initiative 2 of the Northumberland County CAP identifies action items that need to occur by 2025 to improve reporting and tracking of BMPs. It is critical that all plans and implemented projects be reported to State and Federal agencies to be incorporated in data sets. All landowners, operators, and partners deserve recognition for the work they are doing, so in order to tell the success stories, data must be shared. Below are the top two (2) action items listed in the Reporting and Tracking section of the CAP.

- Action 2.1 Existing BMP Cataloguing
    - Identify the location of BMPs through manual and automated digitizing using high resolution aerial imagery and perform field visits where on-the-ground verification is required by regulators
    - Upload BMP implementation data into PracticeKeeper and FieldDoc, as appropriate
- Action 2.5 Improve Agricultural BMP Reporting Utilizing Existing Platforms
    - Increase reporting of plans in PracticeKeeper
    - Work with Capital Resource Conservation and Development (Capital RC&D) and Penn State University (PSU) Producer Survey to produce more complete results

Priority Initiative 3: Achieve New Pollutant Reductions – Numeric Goals

Priority Initiative 3 of the Northumberland County CAP identifies action items that results in reductions to nutrients and sediment. This section of the CAP outlines numeric goals for each county that can be achieved through 2025 when the needed resources are put in place. Below are the five (5) most cost effective BMPs that improve the quality of our local streams by reducing nutrients and sediment.



Cover Crops help to improve soil stability and soil health in agricultural operations. Increasing cover crops not only benefits water quality, but also helps to increase overall productivity of crop fields and long-term soil health. Cover crops can be incentivized through payment programs and continued education/outreach.

Agriculture Conservation or Agricultural E&S Plans are required by state and federal regulations when disturbing more than 5,000 sq feet of soil. Agriculture Conservation Plans are a great way to plan for long-term farm sustainability and improve economic benefits through conservation practices. Conservation Districts and USDA's Natural Resources Conservation Service (NRCS) support by writing Ag E&S and Conservation Plans, along with private sector plan writers.

Nutrient Management or Manure Management Plans are required by state and federal regulations for farmers and landowners who have farm animals. Nutrient Management Plans help with properly applying animal manure to cropland while maximizing the benefits to soil health. Conservation Districts, NRCS, and private sector plan writers are available to develop Nutrient Management and Manure Management Plans.

Forest and grass riparian buffers are excellent ways to address flooding and provide additional habitat for wildlife. Buffers help to provide vital shade for instream life, while also filtering nutrients and sediment from stormwater runoff. Various existing programs help to fund the implementation of riparian buffers while paying incentives to landowners willing to implement them.

Manure storage tanks are an excellent way to properly store manure until croplands are in need of nutrients. Manure pits, stacking pads, and in-barn systems are a few examples of ways to properly store manure. Manure storage structures are effective when sized according to a Nutrient Management or Manure Management Plan. Many cost share programs are available to assist with funding the design and construction of properly sized manure storage facilities.

Priority Initiative 4: Research, Education and Training

Priority Initiative 4 of the Northumberland County CAP focuses on research, monitoring and education through the empowerment of partners. This section includes bolstering existing monitoring efforts and incorporating locally collected data into larger data sets at the state and federal level. In addition, this section includes supporting local watershed and environmental organizations that are critical partners to support implementation. Supporting these organizations with funding and leverage to gain new members is critical to successfully implementing the CAP. A top-down government-led approach will minimize the effectiveness of the plan.

Programmatic Initiative: Recommendations for State Programmatic Changes

The Countywide Action Plan is not limited to county specific initiatives that need to be implemented by 2025. As part of the CAP, there is an additional template specifically intended for changes that need to occur at the State and Federal levels with respect to programs, policies, regulations, and legislative actions. This template allows county partners to hold mutual accountability to State and Federal leaders as we work together to implement the CAP and the overall Chesapeake Bay Pennsylvania Phase 3 WIP. The recommended changes in this template correlate with the challenges listed in this executive summary and the detailed Northumberland County CAP. If these challenges are not addressed with changes to State and Federal programs, many of the goals outlined in the CAP become impossible to achieve. Common themes with programmatic recommendations include funding program enhancements through additional allocations, streamlined permitting, improved reporting and verification, increased flexibility in state and federal guidelines for programs, and additional involvement from state agencies not actively engaged in Chesapeake Bay restoration efforts. Below are a few of the critical programmatic changes that need to occur for the CAP to be successful.

- Action 1.2 – Creation of flexible funding to support county technical assistance positions such as engineers, nutrient management planners, etc.
- Action 1.6 – Expand the MS4 designated implementation area to allow for strategic targeting of pollution from the Urban Sector and cost-effective implementation
- Action 1.20 – Expand the Conservation Excellence Grant (CEG) program to Tier 3 & 4 Counties to assist with project implementation
- Action 1.23 – Create a statewide cover crop incentive program
- Action 1.33 – Institute a bi-annual remote sensing program to increase reporting and verification of practices

Corridors of Opportunity

The Countywide Action Plan requires broad scale planning across entire county jurisdictions. Although the most effective planning efforts may be accomplished at a jurisdictional level, implementation of the plan can be more effective at a watershed scale. As part of the CAP planning process, each county has identified, based on a scoring system, the HUC-12 watersheds that are most effective to work in determined on a range of criteria. The following criteria was used to determine the highest priority watersheds that will produce the most effective results.

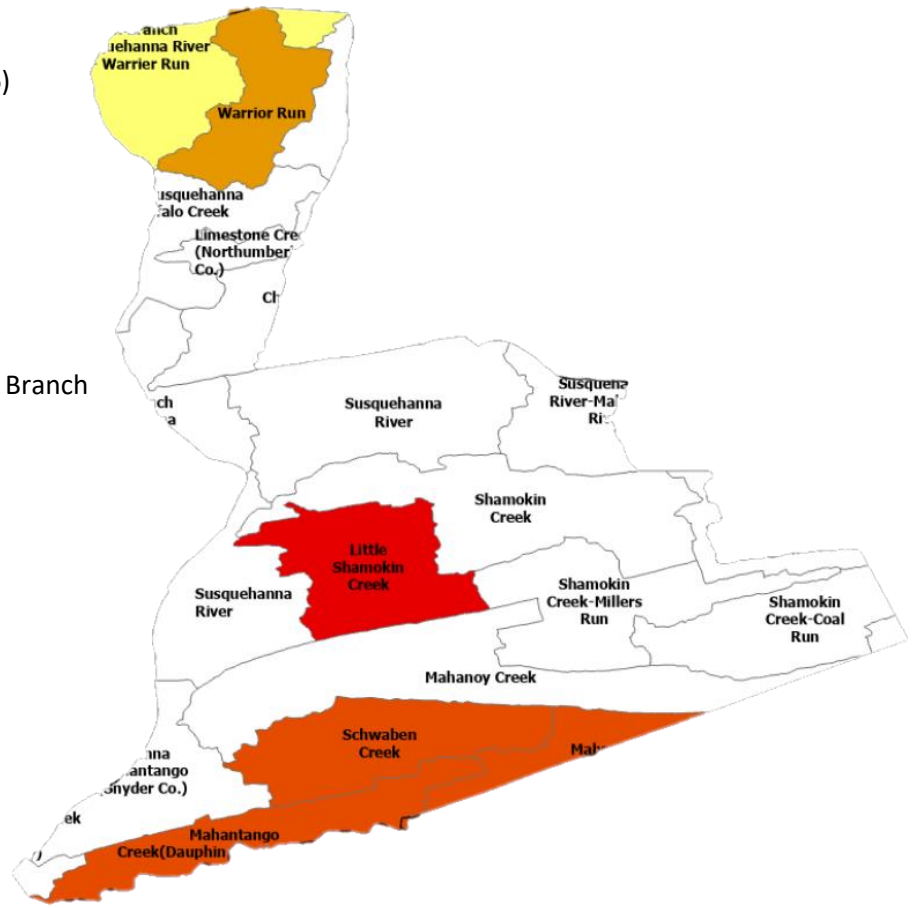
1. *Existing Total Maximum Daily Load (TMDL) & Most Effective Basins (MEB)*: does a watershed have an existing TMDL? If so, what does the TMDL address? Does a watershed fall within National Fish and Wildlife Foundation's Most Effective Basins (MEB)?
2. *Total Nitrogen:* Based on the Chesapeake Bay Programs top 25% nitrogen loading rates along with USGS SPARROW models the watersheds were ranked based on their loading rates of nitrogen to local waterways.
3. *Connecting CAP Goals with Opportunities for Implementation*: Comparing existing land use with numeric BMP goals and programmatic goals in the CAP, how much opportunity exists in the watershed to implement BMPs?
4. *Land Preservation*: Looking at PADEP data sets for existing conservation easements along with the opportunity analysis produced the Bay Program, which watersheds have the highest potential for preserving forest and agricultural land?
5. *Growth*: Analyzing existing infrastructure like rails, highways, and development, which watersheds have the highest potential for future development opportunities?
6. *Partners*: Are there current conservation, watershed organizations, or other organizations active within the watershed who can assist with implementation efforts?

Based on this scoring criteria, below are the top watersheds in each county that will be a high priority of focus for implementation efforts. This does not mean other watersheds will not receive assistance, but these watersheds are anticipated to produce the most effective water quality improvements and leverage the most co-benefits.

Northumberland County:

In Northumberland County the top six (6) priority watersheds are as follows.

1. Little Shamokin Creek
2. Schwaben Creek
3. Upper Mahantango
4. Lower Mahantango
5. Warrior Run
6. Delaware Run – Lower West Branch



Phase 3 Watershed Implementation Plan (WIP) Planning and Progress Template – NORTHUMBERLAND COUNTY

Green - action has been completed or is moving forward as planned Yellow - action has encountered minor obstacles Red - action has not been taken or has encountered a serious barrier

							Resources Available				Resources Needed			
Action #	Description	Performance Target(s)	Partners	Geographic Location	Expected Timeline	Potential Implementation Challenges or Recommendations	Technical	Source	Financial	Source	Technical	Suggested Source	Financial	Suggested Source
Priority Initiative 1: County Programmatic Initiatives														
1.1A	Implement County Comprehensive Plan policies and actions	Ensure that growth activities address existing water quality impairments through stormwater BMP implementation already required by local ordinances Preservation of environmentally sensitive, economically important and culturally important lands – **Conserve 1,800 acres of forest** **-Conserve 70 acres of wetland** Utilize conservation easements to protect land	NCPC, municipal engineers, NCCD, Municipalities, SEDA-COG, Keystone COG, ACT 167 Plan, Hazard Mitigation Plan, Greenway Plan	Multi-Municipality	Ongoing	Educating municipalities, Updating local plans and ordinances, Growth areas not consistent with Census Urbanized Areas Local governments willing to propose to ordinances to protect economically and environmentally friendly landscapes	Education, outreach	1 NCPC staff person			1 – FTE Clean Water Coordinator for Planning Commission	Planning Commission	$130,000 per year $2,000 per acre of forest conserved through easement → Total $3.6M $2,000 per acre of wetland conserved through easement → Total $140K	DEP TBD Funding Options: PA DCNR Community Conservation Partnerships Program CFA Greenways, Trails, and Recreation Program

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1.1B*	Evaluate areas to establish riparian buffers to stabilize stream banks and limit encroachment	Identify landowners willing to participate and work with the partners to identify (5) buffer opportunities Leverage municipal parks along creeks for education, BMP work, habitat value, etc. Protect riparian greenways, promote establishment and maintenance of riparian forest buffers	CBF, Sunbury Chapter of TU, Chesapeake Conservancy, NRCS, NCCD, PAFBC, DCNR, North Central PA Conservancy, Merrill Linn Conservancy, Middle Susquehanna River Keepers, Northumberland AOAA, Watershed groups LSCWA and SCRA, SEDA-COG, PennDOT, AG Land Preservation, Brush Valley Preservation Association, ACT 167 Plan, Greenway Plan	Countywide	5-10 years	Adopting ordinances, may require a pilot project in a willing municipality to demonstrate success. Lack of technical assistance to support implementation goals for forest buffers. Buffer funding programs must include 5- to 10-year minimum maintenance plan, incentive money for landowners, along with volunteers to establish the buffer.	landowner outreach; on the ground riparian project execution	1 County GIS staff person, 2 Conservation District staff people			1 – FTE Clean Water Coordinator for Planning Commission 1 – Additional Watershed Specialist for Conservation District	Planning Commission Conservation District	$130,000 per year $130,000 per year Expand Buffer Bonus Program to provide $5,000 per acre of buffer installed → $1,010,000 total Maintenance equipment/ contract $50,000 per year for upkeep	DEP DEP Funding Options: CFA Watershed Restoration and Protection Program PA Fish and Boat Commission CBF, Alliance for the Bay DCNR, Growing Greener, NFWF

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1.2	Northumberland County Hazard Mitigation Plan	Improve flood prone areas with BMPs that also enhance water quality Develop a stream corridor restoration plan to protect the Susquehanna River Banks and Creek Enforce flood plain development regulations Promote open space preservation and purchase flood prone easements	NCPC, municipal engineers, NCCD, Municipalities, SEDA-COG, Keystone COG, County Comprehensive Plan, ACT 167 Plan	Countywide West Milton and Kelly Township	2022-2025	Funding, land for BMPs, willing landowners to implement projects Enforcement and compliance with local zoning ordinances					1 – FTE Clean Water Coordinator for Planning Commission	Planning Commission	$130,000 per year $2,000 per acre of flood prone easement → total easement TBD $100,000 Stream Restoration Corridor Plan	DEP PEMA/FEMA PEMA/FEMA

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1.3*	Continue to Implement ACT 167 requirements, look to update requirements where opportunities exist to improve water quality benefits	Revise existing model stormwater ordinance where needed. Look to incentivize additional protections for streams Enforce urban forest and landscape management policies for stormwater management Encourage the development of a wellhead protection plan where appropriate	NCPC, municipal engineers, NCCD, Municipalities, SEDA-COG, Keystone COG, Hazard Mitigation Plan, Comprehensive Plan	Countywide	2022-2025	Should local involvement exist, funding to support coordination of ACT 167 requirements	Institutional knowledge	Municipal engineers – assume 6 for well-rounded local background			1 – FTE Clean Water Coordinator for Planning Commission	Planning Commission	$130,000 per year	DEP

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1.4A*	Continue to address and support existing Acid Mine Drainage (AMD) treatment systems and streams impaired by Acid Mine Drainage	Continue to provide funding to both active and passive treatment systems that are reducing the impacts of AMD impairments. If funding recedes water quality could degrade.	PA DEP Bureau of Mining, Conservation District, watershed groups, NRCS, Stream Restoration INC. Office of Surface Mining, AOAA	Countywide Shamokin Creek Mahantango Creek	Ongoing	Need to support legislation regarding the RECLAIM Act to support funding of new treatment systems. Lack of technical assistance to support restoration efforts	Monitoring	Conservation District			Support for monitoring 1 – FTE Clean Water Coordinator for Conservation District	USGS Conservation District	$25,000 per year for water quality monitoring $75,000 per year for maintenance of restored AMD sites $130,000 per year	DEP Bureau of Mining, Abandoned Mine Reclamation Program, USGS DEP

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1.4B*	Identify new funding to support the implementation of Acid Mine Drainage treatment systems	Opportunities still exist to address AMD runoff into local streams. New passive and active treatment systems are needed to support water quality improvements. Work with DEP and other identified partners to find funding to support the implementation of new treatment systems	PA DEP Bureau of Mining, Conservation District, watershed groups, NRCS, Stream Restoration INC. Office of Surface Mining, AOAA	Countywide Shamokin Creek Mahantango Creek	2022-2025	Need to support legislation regarding the RECLAIM Act to support funding of new treatment systems. Lack of technical assistance to support restoration efforts Work with USGS to monitor Shamokin Creek prior to restoration efforts to display the nutrient benefits of AMD treatment. CAST acceptance of results to depict nutrient reductions associated with in stream AMD repair					Coordination of restoration Monitoring Shamokin Creek 1 – FTE Clean Water Coordinator for Conservation District	PL 566 Program with NRCS USGS Conservation District	$10,000,000 $150,000 $130,000 per year	DEP Bureau of Mining, Abandoned Mine Reclamation Program, USGS DEP

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1.5	Anthracite Outdoor Adventure Area (AOAA) Authority conservation measures	6,500 acres to conserve, implement BMPs, implement AMD and recreational activities – specific BMP targets to be identified at a later date	AAOA, NCCD, Keep PA Beautiful, PennDOT, Shingara Enterprises, SEDA-COG, COG Rail Authority, American Chestnut Foundation, Carbon Run Initiative, Shamokin Creek Restoration Alliances	AOAA	2022-2025	Funding and technical assistance to support restoration work Additional AMD needs funding to improve water quality					1 – FTE Clean Water Coordinator for Conservation District	Conservation District	$130,000 per year	DEP, DCNR, NFWF, PAFBC,

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1.6*	Implement County Farmland Preservation Program with farmland preservation program incentives enhancement	**Total farmland preservation 9,104 acres currently in preservation** **54 farms waiting to enter Ag Land Preservation – goal is to enroll as many as funding allows** Utilize conservation easements to protect and preserve agriculture land	4R Alliance, NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation, Greenway Plan	Ag land use area that fits farmland preservation criteria	2022-2023 – explore incentive opportunities	Operator acceptance, additional resources for plan development to incentivize BMP installation as a farmland preservation goal, need funding to support farmers wanting to enter farmland preservation Preserved farms are required to have an NRCS Conservation Plan, work with farmers to ensure Conservation Plan is reported in PracticeKeeper. Recommend making this a program requirement statewide. Sharing NRCS data must comply with 1619 form.					Technical assistance for program management 1 – FTE Clean Water Coordinator for Conservation District	PDA Conservation District	Assume $150,000 per farm → $8,100,000 $130,000 per year	NFWF, GG. Increased Conservation District budget, PDA, SCC DEP

1.7**	Establish funding/staff support to assist the Agricultural community (day to day support) 728 farms exist in Northumberland County Approximately 100 farms have their plans in Northumberland County	**The goal is to Complete 200 total farms by 2025** Work with private consultants to document plans. In order to communicate effectively with the farming community one on one farmer outreach must be conducted. The most effective way to capture and report BMPs is through one-on-one farm visits. Farmers do not participate in surveys or other methods. Work with agricultural community to implement BMPs consistent with E&S regulations	4R Alliance, NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation, Northumberland County Greenways Plan	Countywide AG Land	2022-2025	Limited compliance activities by DEP. Lack of Technical assistance to support the farming community. Private sector Ag plans are not required to be shared with District staff. Work with ACT 38, Preserved farms and organic farms to report AG E&S and NRCS Conservation Plans. These operations are required to have them, but no requirement to report the plans. It is recommended state agencies make changes to ACT 38 and Persevered Farm programs to require PracticeKeeper reporting.	Field verification, troubleshooting	NCCD, USDA NRCS, Private Consultants	N/A	N/A	6 – additional Ag Planners to provide technical assistance and ag planning 3 – FTE Design, Permit construction Services 3 – FTE Design, Permit construction Services 1 – FTE Clean Water Coordinator for Conservation District	District/NRCS/ Private Sector Farm Visits Private Sector/ NCCD Private Sector/ NCCD Conservation District	$780,000 per year $420,000 per year $315,000 per year $130,000 per year	DEP/NRCS/ SCC/PDA DEP/NRCS/ SCC/PDA DEP/NRCS/ SCC/PDA DEP
1.8	Bloomsburg, Susquehanna, and Bucknell University Partnership - Implementation	Develop undergraduate and graduate students so that they can effectively engage in	Bloomsburg University, Susquehanna University, Bucknell University	319 Priority Watershed Riparian properties Preserved farms	2022-2025	Continued undergraduate/graduate engagement as students graduate through program,	Outreach boots on the ground	Bloomsburg, Susquehanna, Bucknell University students	N/A	N/A	5 – Student Internships to Support CAP Implementation	Bloomsburg, Susquehanna and Bucknell University or Other Students who live locally and	$50,000	TBD

Phase 3 Watershed Implementation Plan (WIP) Planning and Progress Template – NORTHUMBERLAND COUNTY

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		landowner outreach during implementation years.		Priority Corridor Watersheds – Warrior Run, Mahantango, Shamokin		implementation funding Lack of technical assistance professionals to mentor students and develop workforce development. Lack of competitive paying job opportunities that ensure long term sustainable for recently graduated students						attend other colleges	See 3.3 for funding needs on plan development and reporting	

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1.9A	Water quality communication plan, leveraging existing documents and covering topics including Comprehensive Plan, Greenway, Plan, ACT 167 Plan, Hazard Mitigation Plan, Watershed Implementation Plans	Develop messages and audience; execute plan and distribute messaging through staff and partners	CBF, Sunbury Chapter of TU, Chesapeake Conservancy, NRCS, NCCD, NCPC PAFBC, DCNR, North Central PA Conservancy, Merrill Linn Conservancy, Middle Susquehanna River Keepers, Northumberland AOAA, Watershed groups LSCWA and SCRA, Universities, Other Recreational groups, Universities, etc.	Countywide	2022 – develop local content, timing, identify responsible staff	Simplifying the resources that are available	Website Development	NCCD	N/A	N/A	Website development and continued maintenance	Consultant	$30,000 per year	Administrative budget tag-along to project-related grant award
											1 – FTE Marketing and Outreach Coordinator	Planning Commission	$130,000 per year	NFWF
											1 – FTE Clean Water Coordinator for Planning Commission	Planning Commission	$130,000 per year	DEP

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1.9B	Agricultural Communication Strategy	One-on-one farm outreach is the best way to communicate with farmers in addition to reporting practices. Work to develop a plan to complete one on one farm visits. Work to develop a communication plan to engage integrators. Partner with external ag partners to present CAP goals at meeting. Utilize Farm Bureau Newsletters for announcements	CD, County Farm Bureau, Integrators, Ag Land Preservation, PSU Extension, NRCS	Countywide	2022-2025	Funding to support the technical assistance required to complete one on one farm outreach Outreach to integrators is a challenge due to the number of integrators and multiple country boundaries they serve. It is recommended DEP/PDA/SCC communicate with integrators on a frequent basis to reduce mixed messages.					6 – additional Ag Planners to provide technical assistance and ag planning 1 – FTE Marketing and Outreach Coordinator 1 – FTE Clean Water Coordinator for Conservation District	District/NRCS/ Private Sector Farm Visits Planning Commission Conservation District	$780,000 per year $130,000 per year $130,000 per year See 1.9A for website costs. Costs for meeting attendance and administration is covered through other funding requests.	DEP/NRCS/ SCC/PDA NFWF DEP

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Priority Initiative 2: Reporting and Tracking														
2.1*	Existing BMP cataloguing (quantity and location) for select BMPs, expanding on general recommendations provided in QAPP BMPs = forest buffers, urban forest buffers, grass buffers, urban grass buffers, wet ponds and wetlands, fencing, cover crop and tillage management	Expand use of existing buffer layer with urban hydrology layer R&D into distinguishing ag, pasture, and turf covers from grassed buffers Manual digitizing where leaf-off <1 ft resolution imagery is available Back check with staff field views where required Add data to Practice Keeper or another batch upload option (FieldDoc)	Lead - Chesapeake Conservancy Stakeholder peer review – Bloomsburg University, USGS, Farm Bureau, PDA, EPA	Countywide	2022 – cataloguing 2023 – Practice Keeper batch upload processing and field views	EPA acceptance of the approach, further refine guidance in QAPP to streamline the process, utilize the approach to catalogue existing BMPs and do on the ground verification where required for reporting purposes, this is an accelerated BMP catch up approach while we continue to provide support to farmers on planning and BMP installs, reduce the amount of interruption of government entities to compliant farm operations	Precision Conservation Tools General methodology outline BMP field backcheck	Chesapeake Conservancy QAPP Varies by BMP	N/A	N/A	Further GIS and data processing/method refinement 5 – Student Internships to Support CAP Implementation	Chesapeake Conservancy Local University Student or local student attending nearby university etc.	$46,000 (2022 only) $50,000	EPA/DEP TBD

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2.2*	Identify future ag/urban project opportunities using automated means	BMP opportunity analysis – ag conservation, land retirement, alternative crop, forest conservation, stream restoration Back check with staff field views Batch upload to FieldDoc to calculate credit opportunity	Lead - Chesapeake Conservancy Stakeholder peer review – Bloomsburg University, USGS, Farm Bureau, PDA	Countywide	2022 – cataloguing 2023 – batch upload processing and field views 2024 – 2025 – implementation focus	Different data set scales/ precision	Precision Conservation Tools Batch upload processing BMP field backcheck	Chesapeake Conservancy DEP/SRBC Varies by BMP	N/A	N/A	Further GIS and data processing/method refinement 5 – Student Internships to Support CAP Implementation	Chesapeake Conservancy Local University Student or local student attending nearby university etc.	$44,000 (2022 only) $50,000 per year	EPA/DEP TBD
2.3*	Develop a local system to capture data collection on urban structural and non-structural practices	Add urban BMPs to CAST/FieldDoc so that as land use data sets are updated, there are accompanying BMPs Use Chapter 102 Permit Close Milestone to report BMPs	Municipal engineers, Chesapeake Conservancy, Keystone Council of Governments	Urban/suburban landscape	2022	Currently municipalities are not collecting BMP data because it is not required in Non-MS4 communities. Must incentivize communities to report, no existing system in place	Reporting platform	FieldDoc	N/A	N/A	Training 5 – Student Internships to Support CAP Implementation 1 – municipal planner	DEP Local University Student or local student attending nearby university etc. Planning Commission, COG, Municipality, etc.	N/A $50,000 per year $130,000 per year	DEP TBD DEP

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2.4*	Implement a documentation program for commercial and homeowner nutrient applications in developed lands Support current legislation for a fertilizer bill.	Support fertilizer legislation – where legislation requires reporting Legislation will support the implementation of **Urban Nutrient Management – 2,000 acres.**	PSU Extension	Countywide	2022	Education of responsible parties, receiving timely information, training on reporting system, will need direction from State on what's expected and any reporting system that's developed, Counties aren't equipped with technology or field experience to manage this initiative Fertilizer Legislation has failed to pass congress in the last two years.	TBD based on fertilizer legislation, if passed	TBD based on fertilizer legislation, if passed	TBD based on fertilizer legislation if passed	TBD based on fertilizer legislation, if passed	1 – FTE Clean Water Coordinator for Planning Commission	Planning Commission	$130,000 per year Urban Nutrient Management $10 per acre → $20,000	DEP DEP/PDA

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2.5*	Improve Agricultural BMP reporting utilizing PracticeKeeper, Capital RC&D Transect Survey, PSU Survey, Manure Transport Reporting and Remote Sensing	**Increase reporting of agriculture plans (30 per year) into PracticeKeeper** Work with Capital RC&D to improve current transect survey routes to be more inclusive Work with PSU to produce better response rate to the PSU survey for Northumberland County Work with PDA/DEP to improve manure transport reporting	DEP, NCCD, NRCS, PDA, NRCS, Northumberland County Farm Bureau, Capital RC&D, Chesapeake Conservancy, PSU Survey, Manure Brokers	Countywide	2022-2025	Private sector ag planners do not have access to PracticeKeeper. Ag planners do not have time to report into PK. Current Capital RC&D routes are not all inclusive and could be improved. Current response rates are low and miss a large demographic of Northumberland County farmers. Manure brokers are not required to report data annually. Data is not inclusive.					1 – FTE Clean Water Coordinator for Conservation District 5 – Summer interns for reporting and verification	Conservation District Local University Student or local student attending nearby university etc.	$130,000 per year $50,000 – paid internships See 3.5 for funding needs to improve cover crop reporting for capital RC&D	DEP DEP/PDA/SCC

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2.6*	Standardized Reporting for Dairy Precision Feeding	County would like to utilize the dairy precision feeding BMP. However, current reporting guidelines do not allow for clear reporting standards on feed reduction amounts, how to report, and who is qualified to report. **-1,000 animal units per year for dairy precision feeding**	Chesapeake Bay Program, Penn State Extension, Dairy co-ops	Countywide	2022	It is recommended that MUN be an acceptable standard for reporting dairy precision feeding. Guidelines need to be posted on acceptable MUN rates and work with dairy integrators to receive MUN data to report to DEP.	N/A	N/A	N/A	N/A	Reporting protocol	Chesapeake Bay Program, Penn State Extension, Dairy co-ops	N/A	N/A
Priority Initiative 3: Achieve New Pollutant Reductions														
3.1	Implementation of the Warrior Run Watershed 319 Plan	Conduct farm visits, windshield surveys, GIS Studies	Bloomsburg University, NCCD, other partners to be identified	Warrior Run Watershed	2021-2025	Funding, landowner interest in BMPs, implementation partner coordination Reverification of existing farm BMPs					1 – New Environmental Specialist	Conservation District	$68,000.00 $1,000,000 to support implementation of Warriors Run 319	Applied for EPA 319 Grant, waiting on approval 319 Program, GG, PDA, SCC, NRCS

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3.2	Accelerated Implementation of Rapid Delisting Catchment Strategy through the Precision Conservation Partnership	Would like to partner in the future with Chesapeake Conservancy to explore rapid delisting approach	Chesapeake Conservancy, NCCD and Precision Conservation Partnership Stakeholders	TBD with input from Chesapeake Conservancy	2022-2025	Gaining landowner interest, design/permit/construction schedules, dedicated funding to support BMP implementation, Lack of technical assistance and engineering staff to support implementation	Program management and GIS Landowner outreach	Chesapeake Conservancy Partnership stakeholders			3 – additional FTE environmental technician	Chesapeake Conservancy, CBF, Clearwater Conservancy, etc.	$390,000 per year $100,000 dollars to complete rapid delisting program management per year → total cost $500,000	DEP/NRCS/ SCC/PDA/ DCNR/NFWF/ Growing Greener/ EPA EPA/DEP

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3.3*	Help farmers and operators to be in compliance with state and federal Conservation and Nutrient Management Plans	**Soil and Water Quality Conservation Plans (AG E&S) 25,000 new acres** **Nutrient Management (Manure Management) 31,000 new acres Core N, 17,500 new acres Core P** Work with ACT 38 operators, Preserved Farms, and certified organics to document plans already required. State agencies must work with integrators to ensure they are requiring compliance by farmers. Some integrators require compliance, but not all, great way to communicate	4R Alliance, NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation	Countywide Ag Land	2022-2025	Lack of DEP inspections. Reporting and verification of AG Plans, NRCS plans expire and do not get reverified, private plans are never entered. Lack of Technical assistance to support agriculture planning and implementation, one on one farm outreach is best way to capture existing plans. Act 38 and Preserved Farm programs are not required to enter plans in PK, Recommendations to require all programs to enter plans into PK with farmers as well.	Educational support	CBF/4R Alliance	CBF grant	NFWF	Cost share support for equipment/ maintenance/ staff 6 – additional Ag Planners to work with farmers	Private Consultant/ District/ NRCS District/NRCS/ Private Sector Farm Visits Conservation Plans Core N and Core P	$150,000 cost share budget per year $780,000 per year $15 per acre for a total cost of $375,000 $15 per acre for a total cost of $465,000	DEP DEP/NRCS/ SCC/PDA DEP/SCC/PDA/ NRCS DEP/SCC/PDA/ NRCS

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3.4	Advanced Nutrient Management (4R) Practice Education and Implementation	Transition manure management plans to nutrient management plans and incentivize implementation **Increase existing 4R practice (N/P Rate by 2,300 acres, N/P Timing by 2,300 acres and N/P Placement by 2,300 acres)** Explore the idea of increasing PSNT or Chlorophyl testing to district program participants	4R Alliance, NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation	Countywide AG Land	2022-2025	Landowner interest, BMP verification (annual). Lack of Technical assistance to support agriculture planning and implementation. Additional funding to support soil testing. Soil testing is key to meeting the recommendations of supplemental BMPs. Machine dependent for most farming operations Cost of fertilizer is self-regulating farmers to use less fertilizer; therefore, lower rates result when PSNTs are done at the beginning of the growing season.	Educational support	CBF/4R Alliance	CBF grant	NFWF	6 – additional Ag Planners to work with farmers to meet 4R standards	District/NRCS/ Private Sector Farm Visits	$780,000 per year See 3.3 for cost share budget for equipment rentals. $10 per acre of advanced nutrient management planning per type → total cost for all is $138,000	DEP/NRCS/ SCC/PDA DEP/PDA/SCC/ NRCS

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3.5*	Implement Practice to improve soil health and sustainability (Tillage Management and Cover Crops)	Determine feasibility of having a county/state cost share program to enhance adoption of the annual practice **Implement tillage management and cover crops on an annual rate of 58,000 acres High Residue, 7,000 acres Conservation Tillage, 4,000 acres Low Residue, 18,000 acres of cover crops and 10,000 acres of cover crops with fall nutrients**	NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation	Countywide Ag Land	2022 – investigation 2023 – next steps	Capacity to manage the program, landowner interest Lack of technical assistance and farm planners to work with farmers to transition to High Residue Tillage Current verification methods do not accurately capture implemented amounts – Capital RC&D survey needs revised Farmers are harvesting cover crops for forage, need accurate efficiency crediting for commodity cover crops	Transect survey Landowner education Existing No-Till farm equipment for Rent – no longer rents Cover Crop Incentive Program	Capital RC&D 1 NCCD staff person Conservation District NCCD	$73,749 in 2019	Growing Greener	6 – additional Ag Planners to transition farmers to high residue County Conservation District – staff to administer the program No-till drill rental program	District/NRCS/ Private Sector Farm Visits Cover Crop Incentive Program NCCD	$780,000 per year $90 per acre traditional per year → $1.62M for a 5 year total of $8.1M (incentive payment, administration, capital RC&D reporting) $50 per acre fall nutrients per year → $500,000 for 5-year total of $2.5M $150,000 for drill and maintenance, storage, admin	DEP/NRCS/ SCC/PDA PDA, SCC, Growing Greener, PACD, DEP

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3.6*	Implement more pasture management BMPs	**Prescribed grazing – 800 acres** **Pasture Alternative Watering – 150 acres** **Grass buffers on fenced pasture corridor – 220 acres** **Forest buffers on fenced pasture corridor – 10 acres** **Land Retirement to Ag Open Space – 205 acres**	NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation Chesapeake Bay Foundation, Chesapeake Conservancy	Countywide ag lands – landowners who raise horses, dairy, beef and other pasture grazing animals	2022-2025	Landowner education, BMP funding for non-buffer work, plan updates, data gathering Lack of Technical assistance to support agriculture planning and implementation Old NRCS plans need to be updated to comply with prescribed grazing definition – difficult to get landowner buy-in – fund alternative watering and fencing; most pastures are streamside Increasing construction costs are resulting in canceled NRCS contracts by landowners.	Landowner education	NRCS	CBF grant		6 – additional Ag Planners to provide technical assistance and ag planning 3 – additional FTE environmental technician	District/NRCS/ Private Sector Farm Visits Chesapeake Conservancy, CBF, Clearwater Conservancy, etc.	$780,000 per year $390,000 per year Prescribed grazing $540 per acre → $432,000 total Off stream watering $500 per acre → $75,000 total Land Retirement $500 per acre → $102,500 total FB Buffer W/ Exclusion $10,500 per acre → $105K total GB Buffer W/ Exclusion $2,750 per acre → $605K total	DEP/NRCS/ SCC/PDA DEP/NRCS/ SCC/PDA/ DCNR/NFWF/ Growing Greener/ EPA ”” ”” ”” ””

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3.7*	Riparian buffer and re-forestation BMPs	**410 riparian forest buffer acres**; Need to recredit additional acres lost since 2010 **62 riparian grass buffer acres**; Need to recredit additional acres lost since 2010 **40 acres – Agriculture Tree Planting** **80 acres – urban forest buffer** **2 acres – urban tree canopy** **120 acres – urban forest planting** **500 acres – forest harvesting practices**	CBF, Sunbury Chapter of TU, Chesapeake Conservancy, NRCS, NCCD, PAFBC, DCNR, North Central PA Conservancy, Merrill Linn Conservancy, Middle Susquehanna River Keepers, Northumberland AOAA, Watershed groups LSCWA and SCRA, Universities, Other Recreational groups, DCNR, DEP BAMR	Countywide	2022 – line up landowners 2023-2025 – implementation	Landowner partnerships, landowner education, volunteer acceptance of buffer plantings, buffer maintenance guide for farmers, routine site visits to confirm buffers are thriving, invasive species removal during establishment Flash grazing must be allowed with buffer installation Funding program must include a 5-10-year maintenance program to establish buffers along with incentive program $4K minimum per acre payment	Materials Mapping	NCCD (in-kind, annual tree sale efforts), CBF Chesapeake Conservancy	Budget available to be determined	CBF, NFWF, NFWS, NRCS - CREP	6 – additional Ag Planners to provide technical assistance and ag planning 3 – additional FTE environmental technician	District/NRCS/ Private Sector Farm Visits Chesapeake Conservancy, CBF, Clearwater Conservancy, etc.	$780,000 per year $390,000 per year Forest Buffer $5,000 per acre → $250K Maintenance equipment/contract $490K Grass Buffer $2,500 per acre → $100K Tree/Forest Planting $10,000 per acre → $1.2M Forest Harvesting $60 per acre → $30K total	DEP/NRCS/ SCC/PDA DEP/NRCS/ SCC/PDA/ DCNR DCNR, NFWF, PACD, TreeVitalize, DEP, Coldwater Heritage Partnership Implementation Grants, Landscape Scale Restoration (LSR) Grant Program – US Forest Service, Pennsylvania Habitat Stewardship Program, Alliance for the Bay, CBF, Chesapeake Conservancy

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3.8	Wetland restoration implementation on marginal production ag land	**82 acres of Wetland Restoration** Identify 1 large property owner from University of Vermont restorable wetland layer to install a wetland	CBF, Sunbury Chapter of TU, Chesapeake Conservancy, NRCS, NCCD, PAFBC, DCNR, North Central PA Conservancy, Merrill Linn Conservancy, Middle Susquehanna River Keepers, Northumberland AOAA, Watershed groups LSCWA and SCRA,	Countywide	2022 –2025	Willing landowner; appropriate siting, design, and construction for successful restoration result Lack of technical assistance for landowner outreach and agriculture planning to identify potential site locations Lead time it takes to secure projects can take years	Landowner outreach	1 NCCD staff person			3 – additional FTE environmental technician 2 – stream biologist	Chesapeake Conservancy, CBF, Clearwater Conservancy, etc. NCCD/ Environmental Group	$390,000 per year $280,000 Wetland Restoration $30,000 per acre → $2.46M	DEP/DCNR DEP/DCNR/PA FBC/USGS DEP/DCNR/ USDA Conservation Reserve Program (CRP) or NRCS Wetlands Reserve Program (WRP)

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3.9	Stream Restoration (Urban and Agriculture)	**10,000 Linear feet (~2 miles) Urban Stream Restoration** **8,000 Linear feet (~1.5 mile) Agriculture Stream Restoration**	CBF, Sunbury Chapter of TU, Chesapeake Conservancy, NRCS, NCCD, PAFBC, DCNR, North Central PA Conservancy, Merrill Linn Conservancy, Middle Susquehanna River Keepers, Northumberland AOAA, Watershed groups LSCWA and SCRA,	Rapid delisting areas top priority & Countywide	2022 – 2025	Design/permit/construction cycle seems to work in two-year increments, there is an assumption that eroded/degraded streams exist based upon 403(d) listing – should that not be the case in the field, adjust quantitative goal down and ensure buffers are in place Lack of funding to cover engineering design	Design/GP-1 permit	Trout Unlimited, Municipalities			Design, permit, construction services 2 – Municipal Engineers 3 – FTE Design, Permit construction Services 2 – stream biologist	Private sector, USFWS, TU Municipalities, Planning Commission, COG Private Sector/ NCCD NCCD/ Environmental Group	Assume $900/LF - $9.0M – Urban Assume $400/LF - $3.2M Agriculture $280,000 per year $420,000 $280,000	Growing Greener, NFWF, DEP, DCNR, PAFBC, USGS DEP/NRCS/ SCC/PDA DEP/DCNR DEP/DCNR/PA FBC/USGS

Phase 3 Watershed Implementation Plan (WIP) Planning and Progress Template – NORTHUMBERLAND COUNTY

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Action #	**Description**	**Performance Target(s)**	**Partners**	**Geographic Location**	**Expected Timeline**	**Potential Implementation Challenges or Recommendations**	**Technical**	**Source**	**Financial**	**Source**	**Technical**	**Suggested Source**	**Financial**	**Suggested Source**
3.10	Implement more barnyard runoff control/loafing lot management	**49 acres of barnyard runoff controls** **72 acres of agriculture drainage management**	NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation	Countywide Farms	2022-2025	Landowner buy-in and project development/funding Lack of Technical assistance to support agriculture planning and implementation Increasing construction costs are cancelling NRCS contracts Lack of funding to cover engineering design					6 – additional Ag Planners to provide technical assistance and ag planning 3 – FTE Design, Permit construction Services 3 – FTE Design, Permit construction Services	District/NRCS/ Private Sector Farm Visits Private Sector/ NCCD Private Sector/ NCCD	$780,000 per year $420,000 per year $315,000 per year Barnyard Runoff Control $175,000 per project, assume 1 acre per project $5.6M in total Agriculture Stormwater Management $10,000 per project, assume 1 acre per project $720K in total	DEP/NRCS/ SCC/PDA DEP/NRCS/ SCC/PDA DEP/NRCS/ SCC/PDA DEP/NRCS/ SCC/PDA/ PennVEST DEP/NRCS/ SCC/PDA/ PennVEST

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3.11	Animal Waste Storage Systems	**5,000 new AUs of livestock waste management systems** **10,000 new AUs of poultry waste management systems**	NCCD, Northumberland County Farm Bureau, NRCS, Private Sector Agriculture Farm Visits, FSA, Ag Land Preservation	Livestock & Poultry farms	2022-2025	Current capacity through NRCS and NCCD implements about 5 farms projects per year; Time to get through planning, design, and construction; outreach to smaller farms that likely need the assistance; match cash value for small farms; readiness to plan/implement projects when outreach efforts yield willing landowners Lack of funding to cover planning, I&Es, and engineering design	Project implementation – 5 farms a year	NRCS, NCCD, Private Ag Sector			6 – additional Ag Planners to provide technical assistance and ag planning 3 – FTE Design, Permit construction Services 3 – FTE Design, Permit construction Services	District/NRCS/ Private Sector Farm Visits Private Sector/ NCCD Private Sector/ NCCD	$780,000 per year $420,000 per year $315,000 per year Animal waste management system $175,000 per project, assume 100 AUs per project $26.25M in total	DEP/NRCS/ SCC/PDA DEP/NRCS/ SCC/PDA DEP/NRCS/ SCC/PDA/ PennVEST

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Action #	**Description**	**Performance Target(s)**	**Partners**	**Geographic Location**	**Expected Timeline**	**Potential Implementation Challenges or Recommendations**	**Technical**	**Source**	**Financial**	**Source**	**Technical**	**Suggested Source**	**Financial**	**Suggested Source**
3.12*	Urban Stormwater Management Non-Regulated Communities	Implement existing ordinances at local municipal level **Stormwater Treatment Performance Standard – 16 acres treated** **Stormwater Treatment Performance Standard – 273 acres treated** **Advanced Grey Infrastructure – 190 acres treated** **Dry Detention Ponds – 65 acres treated** **Infiltration Practices – 58 acres treated** **Impervious Surface reduction – 1 acre**	NCPC, NCCD, developing municipalities, Keystone Council of Governments, Sunbury Municipal Authority, SEDA-COG, DCED	County-wide	Ongoing 2022-2025	Coordination/ training for municipal staff, FieldDoc batch opportunity, non-MS4 engagement (what's in it for them?), very little reporting in the non-ms4 sector, must encourage more reporting Catalogue existing BMPs that fit into this category and newly built ones	Reporting platform	FieldDoc			5 – Summer interns for reporting and verification 2 – Municipal Engineers 1 – municipal planner	Local University Student or local student attending nearby university etc. Municipalities, Planning Commission, COG Planning Commission, COG, Municipality, etc.	$50,000 – paid internships $280,000 per year $130,000 per year Stormwater Treatment $1,815/acre → $29,040 Runoff Reduction $4,162/acre → $1.136M Advanced Grey Infrastructure $132/acre → $25,080 Dry Detention Ponds $7,917/acre → $511,000 Infiltration Practices $7,917/acre → $460,000 Impervious Surface reduction $57,460/acre → $57,460	NRCS/PDA/ DEP TBD DEP

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3.13	Conservation Landscaping/Turf to Meadow Conversion	Promote new program and enable one large tract landowners' participation **120 new acres of Conservation Landscaping**	NCPC, NCCD, developing municipalities, Keystone Council of Governments, Sunbury Municipal Authority, SEDA-COG, Watershed organizations	Developed areas in County municipalities	2022 - 2025	Landowner education and acceptance Existing mowing ordinances and weed ordinances can be a challenge to implementation	Planting plan assistance	Alliance for the Bay (in-kind)			1 – FTE Municipal Planner 3 – additional FTE environmental technician	Planning Commission Chesapeake Conservancy, CBF, etc.	$130,000 per year $130,000 per year $2,500 per acre meadow → $300,000 budget for all	DEP/DCNR DEP/DCNR/ SCC/PDA/ NRCS DCNR
3.14*	Continue dirt and gravel road program	**34 miles overall restored through past projects and future projects** **5,000 new linear feet of D&G Road improvements**	NCCD	Countywide	2025	Continue D&G Road program funding Expand Dirt and Gravel Road Program to include farm lanes	Education, technical assistance, project oversight	NCCD, Center for Dirt & Gravel Road Studies, SCC	$2.4 million since 1998	State Conservation Commission	1 – FTE Clean Water Coordinator for Conservation District	Conservation District	$130,000 per year Dirt and Gravel Roads $40 per foot→ $200,000	DEP/PDA/ SCC SCC

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Action #	**Description**	**Performance Target(s)**	**Partners**	**Geographic Location**	**Expected Timeline**	**Potential Implementation Challenges or Recommendations**	**Technical**	**Source**	**Financial**	**Source**	**Technical**	**Suggested Source**	**Financial**	**Suggested Source**
3.15*	Work with PennDOT and local municipalities to reduce frequency of mowing road ditches and along roadways	Educate local municipal leaders and PennDOT on the importance of keeping higher vegetation along roadways to prevent erosion and increase nutrient uptake.	Local Municipalities, DEP and PennDOT	Countywide	2023	PennDOT's and Municipal willingness to cut back on mowing programs. DEP Chesapeake Bay Program will need to assist in the education of PennDOT.					1 – FTE Clean Water Coordinator for Planning Commission 1 – FTE Clean Water Coordinator for Conservation District	Planning Commission Conservation District	$130,000 per year $130,000 per year	DEP DEP/PDA/ SCC
3.16	Private Funding & Grant Administration	Identify some private funding sources that may be able to supplement public funding sources/existing sources utilized for stakeholders, continue to work with partners to facilitate additional funding	Existing project implementer networks	Countywide	2022-2023	Need to expand network, educational aspect of less common funders, logistics of utilizing unproven funding sources (or lesser known) Grant administration is a challenge due to limited staff and time-consuming nature of grant reporting and administration	Financial services	HRG (CAP coordinator)			1 – FTE Conservation District Grant Manager 1 – FTE Planning Commission Grant Manager 2 – staff accountants	Conservation District Planning Commission Planning Commission & Conservation District	$130,000 $130,000 $140,000 per year	TBD TBD TBD

Phase 3 Watershed Implementation Plan (WIP) Planning and Progress Template – NORTHUMBERLAND COUNTY

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Action #	Description	Performance Target(s)	Partners	Geographic Location	Expected Timeline	Potential Implementation Challenges or Recommendations	Technical	Source	Financial	Source	Technical	Suggested Source	Financial	Suggested Source
Priority Initiative 4: Research, Education, and Training														
4.1*	Develop new water quality monitoring data into Chesapeake Data Explorer/ Chesapeake Monitoring Cooperative database	Location identification, financial and volunteer budget analysis, and initial landowner communication by end of 2021 CAST-21 acknowledgment of our data Map existing monitoring locations Expand monitoring based on Corridors of Opportunity area monitoring gaps	ALLARM, Bloomsburg University, Watershed Associations	To be determined	2022	Land access, expanded volunteer need, equipment/materials budget, Consistent data collection, QAQC continuation Data precision, QAQC, opportunity to educate landowners about local stream health and what they can do about it Consideration to expand the Keystone Water Resources Center			N/A	N/A	Volunteers for Water quality monitoring New monitoring equipment 3 – additional FTE environmental technician 2 – stream biologist	Local environmental groups Conservation District Chesapeake Conservancy, CBF, etc. NCCD/ Environmental Group	N/A $10,000 $130,000 per year $280,000 per year	TBD ALLARM DEP/NRCS/ DCNR/PDA DEP/DCNR/PA FBC/USGS

Phase 3 Watershed Implementation Plan (WIP) Planning and Progress Template – NORTHUMBERLAND COUNTY

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Action #	Description	Performance Target(s)	Partners	Geographic Location	Expected Timeline	Potential Implementation Challenges or Recommendations	Technical	Source	Financial	Source	Technical	Suggested Source	Financial	Suggested Source
4.2	Enhance the capacity of local watershed associations for short-term success and long-term sustainability	Develop new or reestablish existing watershed associations to support with CAP implementation. Watershed organizations can support with outreach, engagement, new project identification and implementation Encourage project implementation on the watershed level so that these partners enhance their relationships with non-peers with a co-benefit of diversifying their membership	Watershed Associations, Trout Unlimited, National Trout Unlimited, Rivers Keeper, Shamokin Creek Restoration Alliance, Little Shamokin Creek Watershed Association, AOAA	Countywide	Ongoing	Willing volunteers and leaders to establish and run watershed organizations to be successful and support with implementation	Social media shares Project development support	County – department to be determined CAP Coordinator (HRG)			1 – FTE Clean Water Coordinator for Planning Commission 1 – FTE Clean Water Coordinator for Conservation District	Planning Commission Conservation District	$130,000 per year $130,000 per year $5000 per organization to produce promotional materials (hats, shirts, stickers) for members → $15,000 total	DEP DEP/PDA/ SCC Enhance the capacity of local watershed associations for short-term success and long-term sustainability

Phase 3 Watershed Implementation Plan (WIP) Planning and Progress Template

Each county-based local area will use this template to identify:

1. Inputs – These are both existing and needed resources, public and private, to implement the identified priority initiative. These include both technical and financial resources, such as personnel, supplies, equipment and funding.

2. Process – what is each partner able to do where and by when. These are the action items listed under each priority initiative.

3. Outputs and outcomes – both short and long-term. These are the priority initiatives identified by each county. The performance targets are the intermediate indicators that will measure progress.

4. Implementation challenges – any potential issues or roadblocks to implementation that could impede outputs and outcomes.

Asterisk: Place an asterisk next to the action number(s) for action items that appear in both the County Planning and Progress Template and the Programmatic Recommendations Template.

For each Priority Initiative or Program Element: Use the fields, as defined below, to identify the inputs and the process that will be followed to achieve each priority initiative. This is the "who, what, where, when and how" of the plan:

Description = What. This may include programs that address prevention, education, or as specific as planned BMP installations that will address the Priority Initiative. A programmatic or policy effort will require some ability to quantify the anticipated benefits which will allow calculation of the associated nutrient reductions.

Performance Target = How. This is an extension of the Description above. The Performance Target details the unique BMPs that will result from implementation of the Priority Initiative and serves as a benchmark to track progress in addressing the Priority Initiative. Performance Targets may be spread across multiple Responsible Parties, Geographies, and Timelines based on the specifics of the Initiative.

Responsible Party(ies) = Who. This is/are the key partner(s) who will implement the action items though outreach, assistance or funding, and who will be responsible for delivering the identified programs or practices.

Geographic Location = Where. This field identifies the geographic range of the planned implementation. This could extend to the entire county or down to a small watershed, based on the scale of the Priority Initiative, range of the Responsible Party, or planned funding/resources. *NOTE: Resource limitations alone should not limit potential implementation as additional funding may become available in the future.*

Expected Timeline = When. Provide the expected completion date for the planned activity. This should be a reasonable expectation, based on knowledge and experience, that will aid in tracking progress toward addressing the Priority Initiative.

Resources Available: Technical & Funding = This field will note technical and financial resources secured/available to implement the program (Description). This is the total of the resources identified in the County Resources Inventory Template below allocated to the priority initiative as a whole; or, if available, to each action.

Resources Needed: Technical & Funding = This field will note technical and financial resources needed/outstanding to implement the program (Description). This is the total of the additional resources projected and identified as needed in the County Resources Inventory Template below allocated to the priority initiative as a whole; or, if possible, to each action.

Potential Implementation Challenges/Issues = This field will note challenges and issues that may delay program implementation (Description).

GLOSSARY

ACT 167 Plan. The Pennsylvania Stormwater Management Act of 1978, or Act 167, required that each county must prepare and adopt a watershed stormwater management plan for each watershed located in the county as designated by DEP, in consultation with the municipalities located within each watershed.

Ag E & S – Agricultural Erosion and Sedimentation Plan. Agricultural Erosion and Sedimentation plans document best management practices on crop and pasture fields to mitigate erosion and protect soil health. Any landowner that disturbs the soil (including no tillage) more than 5,000 square feet (~ $^{1}/_{10}$ acre) must have a written Agricultural Erosion & Sediment Control Plan according to Pennsylvania State law, Chapter 102.

ALLARM – Alliance for Aquatic Resource Monitoring. ALLARM is a program of Dickinson College that enhances local action for the protection and restoration of waterways by empowering communities with scientific knowledge and tools.

AMD – Acid Mine Drainage. Outflow of acidic water from metal mines or coal mines.

BMP – Best Management Practice. Best management practices describe a type of water pollution control. Using agricultural BMPs can help to prevent or minimize the effects of nonpoint source pollution.

CAST - Chesapeake Assessment Scenario Tool. CAST is a web-based nitrogen, phosphorus and sediment load estimator tool that streamlines environmental planning.

CBF – Chesapeake Bay Foundation. The Chesapeake Bay Foundation is a non-profit organization devoted to the restoration and protection of the Chesapeake Bay in the United States.

NCCD – Northumberland County Conservation District. The Northumberland County Conservation District serves as the primary local source of assistance to all individuals and organizations who benefit from the county's natural resources that we collectively strive to sustain and improve.

NCPC – Northumberland County Planning Commission. The Northumberland County Planning Commission makes recommendations and decisions to maintain and enhance the high quality of life for all residents, in accordance with the Pennsylvania Municipalities Planning Code, and other laws and regulations of the Commonwealth of Pennsylvania and the County of Northumberland.

DCNR – Department of Conservation and Natural Resources. DCNR is responsible for maintaining and preserving state parks and forests; providing information on the state's natural resources; and working with communities to benefit local recreation and natural areas.

DEP – Department of Environmental Protection. The Department of Environmental Protection's mission is to protect Pennsylvania's air, land and water from pollution and to provide for the health and safety of its citizens through a cleaner environment.

EPA – Environmental Protection Agency. The Environmental Protection Agency is a United States federal government agency whose mission is to protect human and environmental health.

FEMA – Federal Emergency Management Agency. FEMA supports citizens and emergency personnel to build, sustain, and improve the nation's capability to prepare for, protect against, respond to, recover from, and mitigate all hazards.

FieldDoc – FieldDoc is a protected, online database that uses geographic information to generate baseline nutrient and sediment loading information and calculate load reductions for planned BMPs.

GIS – Geographic Information System. GIS is a computer system that analyzes and displays geographically referenced information.

HUC12 – Watershed. A local sub-watershed level delineation that captures tributary systems draining into the larger Chesapeake Bay watershed.

MMP – Manure Management Plan. Manure management plans document how a landowner plans to capture, store, treat, and utilize animal manures in an environmentally sustainable manner. Every landowner that has livestock or spreads manure on their property must have a written Manure Management Plan according to Pennsylvania State law, Chapter 91.

MS4 – Municipal Separate Storm Sewer System. A separate storm sewer system is a collection of structures, including retention basins, ditches, roadside inlets and underground pipes, designed to gather stormwater from built-up areas and discharge it, without treatment, into local streams and rivers.

NFWF – National Fish and Wildlife Foundation. NFWF works towards sustaining, restoring, and enhancing the nation's fish, wildlife, plants and habitats for current and future generations through innovative public and private partnerships, and by investing financial resources and intellectual capital into science-based programs designed to address conservation priorities and achieve measurable outcomes.

NMP – Act 38 Nutrient Management Plan. Nutrient management plans are required under Pennsylvania State law Act 38 which applies to operations with more than 2,000 pounds live animal weight per acre of pasture and crop fields.

NRCS – Natural Resource Conservation Service. NRCS's programs help farmers reduce soil erosion, enhance water supplies, improve water quality, increase wildlife habitat, and reduce damages caused by floods and other natural disasters.

PACD – Pennsylvania Association of Conservation Districts. Provides support for Pennsylvania’s conservation districts.

PEMA – Pennsylvania Emergency Management Agency. PEMA is tasked with the response to, preparedness for, recovery from, and the mitigation or prevention of disasters and other emergencies.

PracticeKeeper. PracticeKeeper is a protected, online database Used for reporting conservation plans, BMPs, E&S plans, nutrient management plans, watershed plans, complaints, DEP inspection reports and data exports to DEP.

QAPP – Quality Assurance Project Plan. A QA Project Plan documents the technical and quality aspects of a project, including project management, implementation and assessment. It specifies responsibilities, monitoring objectives, sampling design, sample collection methods, analytical methods, quality control, data management and data validation activities. It is required by EPA prior to any monitoring or data collection.

QAQC – Quality Assurance Quality Control. QA/QC is the combination of quality assurance, the process or set of processes used to measure and assure the quality of a product, and quality control, the process of ensuring products and services meet consumer expectations.

4R Nutrient Stewardship – Precision Conservation. Right fertilizer source at the Right rate, at the Right time and in the Right place for optimal crop management.

SRBC – Susquehanna River Basin Commission. SRBC’s mission is to enhance public welfare through comprehensive planning, water supply allocation, and management of the water resources of the Susquehanna River Basin.

SWM – Stormwater Management. Stormwater management is the effort to reduce runoff of rainwater or melted snow into streets, lawns and other sites and the improvement of water quality.

SWP – Source Water Protection. Source Water Protection is a planning process conducted by local water utilities, as well as regional or national government agencies, to protect drinking water sources from overuse and contamination.

USGS – United States Geological Survey. USGS provides science about the natural hazards that threaten lives and livelihoods; the water, energy, minerals, and other natural resources we rely on; the health of our ecosystems and environment; and the impacts of climate and land-use change.

WIP – Watershed Implementation Plan. Watershed Implementation Plans (WIPs) are the roadmap for how the Bay jurisdictions (including Pennsylvania), in partnership with federal and local governments, will achieve the Chesapeake Bay TMDL allocations.

WWTP – Wastewater Treatment Plant. Wastewater treatment plants process contaminants from wastewater or sewage and convert it into an effluent that can be returned to the water cycle with acceptable impact on the environment or reused for various purposes.

Phase 3 Watershed Implementation Plan (WIP) State Programmatic Recommendations Template – Blair, Cambria, Dauphin, Fulton, Huntingdon, Juniata, Mifflin, Northumberland, Perry, Snyder, and Union County

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
Programmatic Initiative: Recommendations for State Programmatic Changes									
1.1	Retain funding and technical support for the Chesapeake Bay Office to spearhead implementation of the County-recommended programmatic changes and support County-led initiatives.	Continued operation of Chesapeake Bay Office and DEP Regional Support Teams through Phase 3 WIP Implementation	2020-2025	Costs associated with staffing, meeting, planning, and supporting implementation efforts. Convincing regulatory/political agencies of the need/benefit for sound integrated planning/implementation so that an appropriate budget is allocated.	Expand the CBO team to be more interdisciplinary, direct involvement by Department of Agriculture, so that messaging is more effective with the agricultural community Support for non-governmental organizations who are already at capacity and need support on expansion.	More dedicated staff to assist coordination and implementation of projects and funding opportunities		At least 6 dedicated staff at DEP and 1 at each County. Participation by other State departments	
1.2	Fund Regional Technical Assistance Positions to work with a group of counties	Fund "circuit rider" technical assistance, engineer positions to support CAP implementation goals	2022-2024	Lack of technical assistance is a challenge and funding positions in every county will be a challenge with limited space and funding. Look to fund circuit rider positions to support large county groupings.	Fund "Circuit Riders" for engineering, technical assistance and other implementation support positions. Partner with state universities with ag engineering, surveying, CAD and or GIS departments to develop work force and connect prospective employees with public and private employment opportunities	Multi-year regional Engineering Contract		$5,000,000	NFWF INSR
Department of Environmental Protection									
1.4	Act 167	DEP increase enforcement of Act 167. All municipal SWM Ordinances consistent with County Stormwater Management Plan and being enforced. DEP provide additional funding to support the implementation of Act 167 plans along with new funding to develop Act 167 plans.	2024	DEP staffing; Act 167 consistent criteria definition.; Act 167 funding is currently inadequate and needs to be increased to support funding for plan development and implementation.	Act 167 plan development cost could be greatly reduced if existing Act 167 Plans & Flow Chart Tool were used as a model.	4 Act 167 enforcement staff - plan development 2 Act 167 enforcement staff - approved plans	DEP	$5,000,000	ACT 167 Block Grant Fund to support new and implementation

Phase 3 Watershed Implementation Plan (WIP) State Programmatic Recommendations Template – Blair, Cambria, Dauphin, Fulton, Huntingdon, Juniata, Mifflin, Northumberland, Perry, Snyder, and Union County

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
1.5	Model My Watershed (MMW) & MS4 Program Permit Based Loads	Work with Model My Watershed to ensure reduction values and efficiencies are similar or predictable between MMW, FieldDoc and CAST. Consider using Model My Watershed to ensure consistency in the 2023 Permit (or future permits) for MS4 Municipalities. Use MMW to assign permit baseloads, reduction requirements, and BMP credits to create consistency statewide. This will begin to make a connection between CAP related goals and MS4s.	2022	Currently results vary between MMW and FieldDoc/CAST. In addition, there is a disconnect between MS4 regulations and CAP goals that can create confusion. To begin aligning goals, systems used by various programs need to align to produce similar and predictable outputs. Current MS4 permit provides municipal level data but requires costly calculations to determine local scale efforts that meet calculated goals. Various DEP/State programs attempt to manage/administer programs at differing scale which isolates these programs into “silos”.	Improve MMW to produce similar outputs to FieldDoc so that CAP projects completed by MS4s result in similar sediment reduction goals, and correlating nitrogen and phosphorus reductions.			$500,000 for improvement to MMW and FieldDoc	DEP
1.6	MS4 Program Expansion of Designated Implementation Area	Demonstrate measurable success of a pilot project area where MS4-regulated areas and non-regulated areas can benefit from achieving sediment and nutrient goals. Currently the guidelines indicate a 1-mile radius around the U.S. Census urbanized area is the expanded area to work in. Continue to consider proposals from municipalities that are developing creative ways to address Pollutant Reduction Plan implementation, especially on agricultural lands that benefit urban land downstream.	2023-2024	PADEP/EPA technical capacity to develop approach with County partners, a comprehensive understanding of the implications of potentially diverting BMPs to more upstream areas rather than constrained urban areas	Recognition of the value of BMPs located at the source of the pollution rather than attempting to reduce pollution after the discharge occurred, opportunity for collaboration among urban and rural sectors for cost effective solutions. Impairments can be a result of upstream pollution or storm velocities, so the watershed should be considered rather than the arbitrary urbanized area.	Engineering/MS 4 permit requirement coordination 1 FT MS4 Coordinator, 1 PT ag Coordinator	HRG (CAP coordinator) Municipal staff Municipal engineers, consultants		
1.7	Act 38 Program	Update Act 38 Program to require Ag E&S or Conservation Plans to be entered into PracticeKeeper on an annual basis to close reporting timing “gaps” and improve reporting precision. Nutrient management plans are already part of this process.	2022	Additional time for County Conservation District staff to enter plans in PK that they collect through their outreach to farmers.	Require plans be entered into PK to improve reporting. DEP should provide staff hours to assist with Act 38 plan reporting.	200-hour staff hours to support PK Reporting	DEP	See 1.12 for funding needs	

Phase 3 Watershed Implementation Plan (WIP) State Programmatic Recommendations Template – Blair, Cambria, Dauphin, Fulton, Huntingdon, Juniata, Mifflin, Northumberland, Perry, Snyder, and Union County

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
1.8	Improve Wellhead Protection Statewide	Pennsylvania develops a more robust statewide recommendation to protect wellheads while incorporating WIP goals where feasible.	2024	Current standards are set by local jurisdictions and can range in effectiveness. There is no dedicated funding for BMP implementation or land acquisition where groundwater protection would benefit.	DEP compiles a GIS application that maps all of the wellhead protection areas across the state. That information is shared with CAP coordinators so that precision agriculture education and outreach, and dedicated funding, can be focused in these areas. Provided dedicated funding for groundwater monitoring to recognize the resulting improvements in nitrogen over following decades.	Additional Staff time, mapping, precision ag education/technical resources, groundwater monitoring equipment and maintenance	DEP		
1.9	DEP Staff Support in development of Source Water Protection Plans where feasible	Work closely with DEP regional staff to develop Source Water Protection Plans where feasible. Recommended to have additional funding available to support the development of Source Water Protection Plans. Recommended to have money for Source Water Protection Plan implementation.	2022	Lack of funding currently available to develop Source Water Protection Plans.	DEP compiles a GIS application that maps all of the wellhead protection areas across the state. That information is shared with CAP coordinators so that precision agriculture education and outreach, and dedicated funding, can be focused in these areas. Provided dedicated funding for groundwater monitoring to recognize the resulting improvements in nitrogen over following decades. Funding available for implementation of Source Water Protection Plans	DEP Staff	DEP Regional Offices	$5,000,000 to assist with plan development and implementation	DEP
1.10	Nutrient Trading Program	Pennsylvania improve education and outreach of nutrient trading program to include more participants. Look to incentivize new partners willing to participate in the program. Accurately document credits that are traded out of the Chesapeake Bay Watershed to represent reductions for the county trading credits.	2022-2024	Many of the wastewater and non-point source (farms) facilities within the Chesapeake Bay Watershed actively trade credits outside of the Watershed. Make sure to accurately document these trading credits and credit is given to counties trading away credits. More education is needed on the perks of the program.	Work with EPA/water pollution control facilities to document when credits are traded, how much is traded, and how to accurately count those reductions toward CAP goals. Look for ways to incentivize more BMP implementation through the program guidelines including a connection to MS4 and a reduction in stormwater fees for farmers. Work with generators who are selling credits outside the Bay watershed to function as a credit for the WIP goals. Another concept would be to create a tiered system of credits based on geographic location (River basin) where the credits are generated.				

Phase 3 Watershed Implementation Plan (WIP) State Programmatic Recommendations Template – Blair, Cambria, Dauphin, Fulton, Huntingdon, Juniata, Mifflin, Northumberland, Perry, Snyder, and Union County

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
1.11	PA One Stop	PA One Stop offers the ability to educate farmers on how to write and develop their own plan. Current PA One Stop classes do not offer all modern farming techniques and practices. Work with PA One Stop to update program to current practices.	2023	PA One Stop developed private plans are not reported in the model. Work with PA One Stop to require those who attend the class and develop a plan report this plan to PA One Stop for reporting in CAST.	Update PA One Stop Class to include current practices and operational standards. Work with PA One Stop to require reporting of privately developed Ag Plans.	Additional PA One Stop Staff to make training improvements	PA One Stop	$500,000 to provide improved training and make program changes	PDA/DEP
1.12	Capital RC&D	Revise current Capital RC&D cover crop and tillage reporting to be more robust and up to date. Due to current methods, there is a two-year reporting cycle with the Capital RC&D Transect Survey and Model update. There is an expectation that the Capital RC&D transect survey is significantly underrepresenting no-till and cover crops that are reported.	2022	Farmer meetings resulted in a general consensus that more that 60-70% of farmers are no-tilling with a significant portion cover cropping in addition. Numbers reported to CAST significantly underrepresent consensus by the ag community. Numbers submitted by Capital RC&D are either not accepted in their entirety or Capital RC&D needs to produce more robust and realistic numbers.	Work with Capital RC&D and EPA to ensure numbers are not lost in translation. Work with EPA to update numbers on a more timely basis. Overall look to match consensus in the ag community that more than 60-70% of fields are operated under full no-till. State incentive program/FSA crop insurance information could be connected to cover crop implementation on an annual basis. No-till equipment is a capital improvement for producers, so assurance with the producer that they continue to use the equipment on a rotating basis (5-years) should serve to reverify that no-till is being implemented. Research feasibility that aerial photography or other remote sensing options are available to accurately capture cover crop usage.	Additional staff for Capital RC&D	Capital RC&D	$1,500,000 to complete more robust reporting and begin utilizing aerial remote sensing information	DEP
1.13	Provide internship Program to County Conservation Districts to support with PracticeKeeper data entry	Provide 1-2 interns per county Conservation District for the summer of 2022 to support data entry into PracticeKeeper.	2022	Conservation Districts need enough time to hire and support interns in summer of 2022. Conservation District staff do not have time to train interns. Funding available to support interns.	Recommended that DEP provide a 1–2-week intro training to all Conservation District interns to free up staff time. District employees can then support interns once trained. Must be a paid internship. Year 1 – desktop work – PK data entry, GIS mapping, plan administrative reviews Year 2 – begin field inspections with professional staff, BMP verification field work, entry level plan development	40 interns	PACD/ Conservation Districts	$400,000	DEP

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
1.14	Establish Pre-application permit meetings with CAP counties on monthly basis	Work with DEP Chesapeake Bay Office and Regional Offices to establish pre-application meetings for Chapter 105 and NPDES permits related to manure storage to ensure projects are permitted in a timely manner	Ongoing	Permit review time can take months to years for some projects, with stream restoration projects taking the longest. We need to ensure projects are permitted quickly to accelerate nutrient reductions and result in predictable construction schedules.	Establish a standing monthly day and time that a region of CAP counties can attend a pre-application meeting.	DEP South Central and North Central Office Staff	DEP		
1.15	Increase funding for Act 537 program to support plan development	Increase funding to the Act 537 programs to support additional plan updates or development	2023	Current lack of funding prevents local governments from developing Act 537 programs, especially for special study areas.	Increase funding to program to support the development of new or updated Act 537 plans.	Additional staff to support the Act 537 program	DEP	$5,000,000 to support updated plans or new plans	DEP
Funding									
1.16	Relax the Prevailing Wage requirement when private landowners invest their own money in water quality projects between now and 2025	Relax the requirement of prevailing wage from grant programs from now to 2025 when private landowners invest their own money to bring the cost of projects down and increase the willingness of landowners to implement projects.	2022-2025	Increased construction material costs along with required prevailing wage is turning landowners away from implementation, especially while it is expected that landowners have a share of the cost. Stakeholder meetings have recommended that without the requirement of prevailing wage, more landowners would be willing to implement projects because of lowered overall construction costs.	It is recommended to remove the requirement of prevailing wage from grant programs to reduce the overall cost of a project where landowners invest in the project, and for a finite period of time (2025 or the prevailing Chesapeake Bay Agreement timeline). Landowners do not want to complete a project with prevailing wage, because non-cost shared cost on the farmer drastically increases due to wages associated with prevailing wage. More projects would be fundable without prevailing wage. The trigger for the relaxation of the Prevailing Wage requirement should be based upon a percentage of the total cost of the project up to $10,000 or 10%.				
1.17	Allow Regional Entities to Administer Grant Funding	Change state and federal grant programs to allow award recipient to be outside of county government with a release form signed by county government. This will remove the burden of grant administration from county government. The following funding sources are potential impactors (Chesapeake Bay Block Grant, Growing Greener, NFWF, RCPP)	2022-2025	Current grant programs are primarily designed to support county government. With limited staffing capacity at county government grant administration is becoming a burden and county government cannot take on additional funding due to administration concerns.	Allow regional entities to manage grant programs working very closely with implementation counties. Common organizations can be Tri-County Regional Planning Commission, Southern Allegheny Planning Commission, non-profit organizations, and private entities. These organizations are already established to handle grant administration and remove the burden from recipient county government organizations.				

Phase 3 Watershed Implementation Plan (WIP) State Programmatic Recommendations Template – Blair, Cambria, Dauphin, Fulton, Huntingdon, Juniata, Mifflin, Northumberland, Perry, Snyder, and Union County

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
1.18	Expansion of MS4 Grant Funding	Create a new "block grant" fund to solely support MS4 implementation. Currently MS4 municipalities are competing with other priority sectors and participants for MS4 Funding. To support the MS4 community develop a specific pot only eligible to MS4 communities.	2023	Securing funding for pot of money solely for MS4 communities. With increasing usage of local stormwater fees to fund stormwater infrastructure, this makes a great opportunity to create match sources to fund water quality projects and for communities to utilize their fees for infrastructure operation and maintenance.	Recommended to expand environmental stewardship funding to separate pot of money specifically for MS4 communities to fund PRP projects.	Staff support to administer program	DEP	$15,000,000 to support project implementation	DEP Environmental Stewardship Fund
1.19	Real estate tax Incentives statewide for BMP Implementation	Support legislative action that would credit landowners with a tax credit for the implementation of long term BMP implementation.	2023	Legislative will to pass an incentive program for landowners to provide tax incentives. Setting program rules for tax incentives.	Review REAP tax credit program for addition of real estate tax credits for BMPs that remove land from production (buffers, grassed waterways). This would function as an alternative to the CREP program, which has fallen out of favor with farmers.				
1.20	Conservation Excellence Grant	Ensure the Conservation Excellence Grant program is available for Tier 3 & 4 counties to fund project implementation. Conservation Districts need block grant and CEG funding to leverage relationships with farmers and have the ability to engage more landowners.	2022	Most funding is dedicated toward Tier 1 & 2 counties. It is crucial that Tier 3 & 4 counties have the same opportunities for funding. With Conservation District funding remaining flat for +10 years, it is crucial to have readily available funds to promote education, outreach and accelerate work.	It is recommended that each district receive a minimum of $500,000 dollars each year to administer for agricultural projects.	Staff to support CEG Administration	Conservation District	$20,000,000 to support additional staff and project implementation	SCC/PDA
1.21	REAP Program	Work with REAP Program to remove the funding for vertical tillage equipment. Work with REAP to promote more incentives for true no-till equipment.	2022	Some farmers are using vertical tillage for operational purposes. Educate farmers on the impact of vertical tillage (seed bed preparation on the short-term versus compaction and erosion on the long-term). Vertical tillage is being reported as conservation tillage and does not receive as much credit as no-till.	It is recommended that no-till preparation and seeding equipment is more incentivized than vertical tillage equipment through the REAP program.	Program revision	SCC staff		
1.22	Support new and innovative ways to fund Countywide Action Plan Implementation	Support Senate Bill 525 – expanded Growing Greener Program Support Senate Bill 465 – Agriculture Conservation Assistance Program	2022	Support new and innovative ways to fund Countywide Action Plan Implementation. Legislative will to pass additional funding options have failed to pass in recent sessions and a need for sustainable, long-term funding is critical for WIP implementation success.					

Phase 3 Watershed Implementation Plan (WIP) State Programmatic Recommendations Template – Blair, Cambria, Dauphin, Fulton, Huntingdon, Juniata, Mifflin, Northumberland, Perry, Snyder, and Union County

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
Pennsylvania Department of Agriculture and State Conservation Commission									
1.23	Cover Crop Incentive Program – Statewide Funding	Pennsylvania Department of Agriculture and State Conservation Commission administer a statewide program to fund a Cover Crop Incentive Program. Provide block grant funding to each County Conservation District to allow each district to establish parameters based on growing season, species types and plant by dates. Funding must be provided long term and have limited statewide regulation to allow for differences in farming techniques by county. Currently, the farming community assumes that 30-40% of crop acres receive cover crops each year.	2022-2025	Many farmers across Pennsylvania are harvesting cover crops for forage. Current commodity cover crop BMP efficiencies do not accurately credit nitrogen and phosphorus reductions associated with the practice. In addition, many cover crop programs do not allow for harvest in the spring. Cover crop program must pay for incentives to both existing farmers who have been implementing cover crops and new farmers. Establishing planted by dates can be challenging with changing climate and increased precipitation years, especially for multispecies cover crops. Dates and multispecies requirements must be flexible based on climate and precipitation during the growing season.	Local farm outreach meetings provided recommendations to increase cover crop through incentivizing payments similar to Maryland's program. A statewide program would be inadequate due to differences in farming season length and types by county across Pennsylvania. It is recommended Pa providing funding to Conservation Districts to establish cover programs with county specific rules on date of planting, species type and other requirements that fit county farming standards.	County Conservation District staff to administer program	Conservation District	$15,000,000 annual	PDA, SCC, DEP, FDA
1.24	Dirt and Gravel Roads Program	Expand Dirt and Gravel Roads program to include private farm roads/lanes as part of funding program, look to cost share with forested and agricultural landowners. Ensure funding exists for low volume roads. More funding is dedicated to Dirt and Gravel Roads opposed to Low Volume Roads.	2023	Stakeholder meetings have identified farm lanes as a major source of sediment and runoff from farming operations. With limited income many of these farmers are unable to fund lane improvement projects.	Dirt and Gravel Roads is a proven grant program that landowners are willing to work with. It is recommended to expand this to including severely impaired farm lanes and roads that are a leading source of sediment runoff. It is recommended to administer a portion of cost share with farmers.	Administration Support	SCC/ Conservation Districts	$10,000,000 per year	Money from outside of transportation funds to bolster the overall budget

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
1.25	Work with Integrators and Producers to Communicate WIP Goals	PDA and SCC convene bi-annual meeting with integrators to communicate the goals of the Phase 3 WIP and how integrators can help to achieve agricultural related implementation goals including reporting their producers' activities and helping to advance additional activities on agricultural land. Also, it is encouraged to recommend that integrators require agricultural compliance plans and BMPs, in addition to sharing success stories of how integrators can help fund and implement BMPs that promote agricultural sustainability and water quality improvements.	2022-2024	Integrators are directly linked to producers throughout the agricultural industry. It is important to educate integrators to get them to understand the issues surrounding water quality and the importance of agriculture's involvement is conservation practice implementation. Convincing integrators to, at a minimum, require agriculture compliance of operations may be a challenge. The total number of integrators across the state of Pennsylvania can be challenging to coordinate, and they function regionally. Many farmers who work directly with integrators do not report practices implemented to either NRCS or County Conservation District. Integrators must work with farmers and County Conservation Districts to report BMPs implemented.	The following is a list of potential integrators to meet with: Bell and Evans, The Hershey Company, Empire Kosher, Country View, Kramer's, Pilgrims Pride, Purdue, DFA, Ritchey, Galliker Dairy Company, Farmers Assuring Responsible Management (FARM), Maryland Virginia Dairy, Turkey Hill, Organic Markets, Land O'Lakes, Dairy Farmers of America, Maryland and Virginia Milk Producers Cooperative, BJE Poultry, Chick to Chicken, Tyson, Purdue, Eggs for Vaccines, Smithfield Hatfield, Swift, etc. Local farm outreach/meetings have identified integrators and producers as one of the best methods to communicate with farmers. Due to the number of integrators and geographic locations they serve, it is recommended that state agencies convene these businesses to communicate consistent messaging, share why some integrators are pushing conservation, and needed results.	Staff Support time	PDA/SCC/ DEP/NRCS		
1.26	Farmland Preservation Program	Update Farmland Preservation Program to require NRCS Conservation Plan to be entered in PracticeKeeper on an annual or bi-annual basis to close reporting "gaps" and improve reporting. Increase farmland preservation program funding to increase number of farms preserved per year. Current waiting lists are growing larger in each county.	2022	Additional time for county conservation district staff to enter plans in PK. Sharing of NRCS data and plans can be challenging. Funding currently available to support farm preservation is inadequate. Must increase to support number of farmers wanting to enter preservation.	Require plans be entered into PK to improve reporting. Potential for DEP to provide staff hours to help enter NRCS plans into PracticeKeeper. Increase funding allotment per year to increase rate of preserving farms. Supply additional staff support to counties.	Farmland preservation program staff	Conservation Districts	Increase budget per year by $10,000,000 to support additional staff and more preserved farms	PDA
1.27	Organic Farms	Work with organic farming industry to educate them on the importance of no-till and come up with innovative ways to reduce tillage for weed control.	2022	With increased organic markets additional tillage is required to manage weeds.	PDA and SCC work with organic farmers to reduce tillage and return to no-till farming in a method that is consistent with organic standards.	Staff Support time	PDA/SCC/ DEP/NRCS		

Phase 3 Watershed Implementation Plan (WIP) State Programmatic Recommendations Template – Blair, Cambria, Dauphin, Fulton, Huntingdon, Juniata, Mifflin, Northumberland, Perry, Snyder, and Union County

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
Chesapeake Bay Model - CAST									
1.28	Commodity Cover Crops	Commodity cover crops receive little to no credit for nutrient reductions. Modified credit is needed to achieve pollution reduction goals.	2023	Receiving credit approval by EPA's Chesapeake Bay Program and Workgroups.	Recommended to classify all cover crops that receive nutrients and are harvested as cover crops will fall nutrients. Many farmers are harvesting cover crops for forage and seeing an increased benefit from harvesting cover crops opposed to burning them down in the spring. Increased reduction efficiency value are necessary.	Staff support from DEP to assist with CAST changes	DEP		
1.29	Dirt and Gravel Roads	No nutrient reductions are associated with dirt and gravel road implementation. Additional studies are needed to prove nutrient reductions are occurring	2023	Receiving credit approval by EPA's Chesapeake Bay Program and Workgroups.	Recommended to work with dirt and gravel road program to conduct studies to prove nutrient reductions are occurring with road improvement projects.	Staff support from DEP to assist with CAST changes	DEP		
1.30	Acid Mine Drainage in Stream Benefits	Work with AMD impaired stream segments to monitor pre-treatment and post-treatment to identify the nutrient uptake benefits from improving a degraded stream by AMD to a healthy stream segment that can process nutrients.	2025	Receiving credit approval by EPA's Chesapeake Bay Program and Workgroups. Producing water quality monitoring that is acceptable and identifies clear improvements. Time associated with monitoring improvements.	Recommended DEP Bureau of Mining work with USGS/SRBC and other DEP Bureaus to monitor a heavily impaired stream segment pre and post treatment.	Staff support from DEP to assist with CAST changes	DEP		
1.31	Combined Sewer Overflow Systems	Current CAST reported loads from CSO systems do not accurately capture estimated volumes/loads from CSO systems. Work with CSO permittees to report system performance estimates to inform load estimates and work to reduce finger pointing to other sectors. Continue to improve accuracy of wastewater reporting numbers with significant and non-significant facilities.	2022	Increased storm events are frequently producing overflow stormflows systems cannot handle leading to combined sewage discharges. It appears these discharges are not accurately captured in CAST by smaller CSO permittees in the Pennsylvania portion of the Watershed. By not accurately capturing CSO facilities finger pointing can be contributed to other sectors. It is important to accurately establish crediting to appropriately address the issue.	Use estimated discharges from CSO permittee annual reports. Support CSO management programs with additional funding, similar to suggested MS4 program implementation support grants, thereby preventing further nutrient loads to streams.	Staff support from DEP to assist with CAST changes	DEP		
1.32	Barnyard Runoff Controls	A few counties are listed as 100% implementation of all barnyard runoff controls. Counties have identified this number as inaccurate and needs revision.	2022	Juniata and Mifflin Counties are not accurately represented in CAST in respect to barnyard runoff controls.	Work with EPA and CAST representatives to fix the issue in Juniata and Mifflin Counties.	Staff support from DEP to assist with CAST changes	DEP		

Phase 3 Watershed Implementation Plan (WIP) State Programmatic Recommendations Template – Blair, Cambria, Dauphin, Fulton, Huntingdon, Juniata, Mifflin, Northumberland, Perry, Snyder, and Union County									
						Resources Needed			
Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Technical	Suggested Source	Financial	Suggested Source
Reporting and Verification									
1.33	Institute a bi-annual remote sensing program for BMP verification	Fly counties on odd years and process data on even years to verify installation of BMPs Utilize existing BMP location data to verify those BMPs	2021	Funding, staff for sample of field verification, see if MS4s would be willing to cost share if we can demonstrate that we can reduce their BMP inspection burden with this method. EPA acceptance of remote sensing approach is challenging. EPA has shown in the past they are reluctant to immediately accept new approach ideas.	Utilize counties to pilot BMP verification hurdles; refer to Cumberland County and Centre County 2021 Block Grant request that includes Chesapeake Conservancy funding/methodology for select BMP cataloguing.	GIS processing methods		$100,000 per year per county for BMP cataloguing	
1.34	Develop a method/ model/template to capture and report non-manure nutrient management plans	Develop a method to encourage, perform, capture, and report the 4R nutrient management practices along with nutrient management plans for farmland acres receiving fertilizer.	2022	Will require close coordination and cooperation between regulatory agencies, private fertilizer companies, and farmers to achieve a statewide model.	Dept of Ag/DEP/farmers to coordinate at State level with the fertilizer industry; State or Bay-wide system needed for consistency. Coordinate with ag consultants	State ag/ farming/ fertilizer industry experts		Reporting expenses not offset by increased production	
1.35	Implement a reporting program for commercial and homeowner nutrient applications	Support fertilizer legislation – where legislation requires reporting, be the data clearinghouse	TBD – based upon passage of legislation	Education of responsible parties, receiving timely information, training on reporting system	Pair reporting with another generally used reporting mechanism to State Government	Landowner education		$1,000,000 for reporting mechanism	Refer to other states with similar program
1.36	PracticeKeeper	Expand PracticeKeeper to include in field GIS Spatial abilities to map projects in the Field using GPS coordinates to simplify reporting process Continue to expand PK to allow additional 3rd party planners have access to enter manure management and AG E&S plans Ensure Conservation District is able to see all data enter by Private sector and DEP	2021-2025	Will need to address privacy concerns; may need changes to Right to Farm Act. Coding Issues, and seat license for private Ag planners.	Work with outside organizations to develop a GIS system that can connect with PK Data in Practice Keeper should be utilized for more than reporting to DEP. CD staff should be able to use it for program management so that BMPs are timely re-verified and farms that are compliant/on-schedule aren't revisited prematurely	State Ag staff/ CD's/ County/ municipal planners /software experts		$1,500,000 Software costs/staff costs	DEP/PDA/SCC

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
1.37	FieldDoc	Ensure FieldDoc displays transparent progress to "live" track the progress each county is making toward achieving their goals Ensure each county has a FieldDoc Profile established in a timely manner	2022	Multiple systems working together to communicate progress.	Recommended to continue updating FieldDoc to be a transparent program that displays data "live"			$1,500,000 Software costs/staff costs	DEP
1.38	Manure Haulers and Brokers – Manure Transport Reporting	Recommended to require all manure brokers and haulers to report on an annual basis the amount manure transported to and from a county.	2022	Requiring all haulers and brokers to submit data timely and on an annual basis.	Recommended DEP gather this information and report this to CAST on an annual basis	Additional Staff to work with haulers and brokers	DEP	$1,000,000 Software costs/staff costs	DEP/PDA/SCC
Department of Conservation and Natural Resources									
1.39	Buffer Incentive Programs	DCNR revise buffer programs to include 5-10 year maintenance agreements to take the lift off of implementing landowners. Look to incentivize landowners up to $5K per acre of buffer installed. Must include volunteers or staff to help implement buffers. Buffer incentive programs should allow landowners to flash graze with livestock when feasible around buffer plantings.	2022-2025	Finding willing landowners to implement buffers is a challenge. In order for buffers to be more palatable they must include maintenance, incentives, and support for planting. Education and time associated with each buffer is a challenge. Maintenance of buffers is challenging. Flash grazing with livestock can assist with helping to maintain buffers over time.	It is recommended that DCNR contract with a maintenance organization to provide full buffer maintenance across the state of PA. It is recommended to develop a similar program to the Alliance for the Chesapeake Bay in order to "sell" more buffers. Program changes to allow flash grazing in buffers to maintain vegetation.	Additional Staff to work landowners on buffer implementation	DCNR, DEP, PDA, SCC, NRCS	$25,000,000 to assist with implementation and maintenance	DCNR, DEP, PDA, SCC, NRCS
PennDOT									
1.40	Reduce mowing of rights-of-way and roadside ditches	PennDOT work with mowing contracts to reduce the number of times per year of mowing roadside ditches and rights-of-way, especially targeting environmentally sensitive areas.	2022	Higher weeds visually look "messy," however environmental benefits will help with nutrient and sediment reductions.	Recommended to cut mowing back to 1-2 times per year while maintaining soil health and noxious weeds.	Review operation and maintenance procedures for reduced mowing and invasives control	PennDOT		

Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Resources Needed			
						Technical	Suggested Source	Financial	Suggested Source
1.41	Plant seed and erosion control matting immediately after grading and berm maintenance occurs	PennDOT requires crews to perform seed spreading or other vegetative establishment efforts when berms are graded or cut back. This effort exposes loose soil and creates runoff issues in the absence of matting, straw, and seeding.	2022	Ensure accurate E&S CAST model credit is documented with maintenance efforts.	Also work with municipalities to educate them on the importance of properly managed roadways, rights-of-way and other environmental sensitive areas.	Review operation and maintenance procedures for reduced mowing and invasives control	PennDOT		
Pennsylvania State Game Commission									
1.42	Pennsylvania Game Commission – Rented/Farmed Acres	PA Game Commission work with farmers to require conservation practices be included with farming operations (no-till, cover crops, filter strips, vegetative strips, buffers, etc.) PA Game Commission require farmers and/or game commission to document Conservation and Nutrient Management compliance – work with County Conservation District	2022	Many of the Game Commission-owned acres are rented out and may switch hands each year. Game Commission needs to require plan compliance and documentation each year. Bird habitat farming is becoming more popular and does not have conservation plans.	Game Commission develop a conservation plan for all farming acres that PA Game Commission implements/farms. PA Game Commission work withs county conservation districts to ensure farmers renting ground are in compliance and documenting acres annually. Work with game commission officers located in Harrisburg and work with local Game Commission land managers for Union and Snyder.	Staff to support implementation and ensure compliance	PA Game Commission	$1,500,000 to support implementation on game lands	PA Game Commission
National Resource Conservation Service (NRCS)									
1.43	Fund NRCS Regional Resource Conservation and Development (RC&D) Coordinators	Provide funding to support NRCS Regional RC&D Coordinators to support BMP Implementation across regional groupings	2023	Challenge to convince NRCS to provide additional funding to RC&D Program	Provide 2 – regional RC&D Coordinators per grouping of 3-4 County Coordinators. DEP/SCC/PDA work with NRCS to provide funding to support RC&D coordinators.	RC&D Coordinators	NRCS	$5,000,000 to support regional RC&D Program	NRCS
1.44	Flexibility for farmers utilizing NRCS programs for implementation	The guidelines set for in NRCS programs including but not limited to CREP, REAP, Conservation Planning, RCPP, etc. are constraining on implementation.	2023-2024	The need for more flexible funding and program guidelines. NRCS does not always work with local stormwater ordinances in advance. Many times, this will fall to the Conservation District and can be time consuming. Recommendations: to encourage NRCS to comply more with local ordinances.	It is recommended that NRCS, EPA, and USGS advance the findings of the "Coordinating NRCS and EPA Agricultural Conservation Funding Programs in the Chesapeake Bay Watershed" report (January 8, 2021). The mission of the group should be to allow more flexibility to improve the willingness of landowners to utilize public funding.	Utilize local partners to continue a 365-degree review of program optimization needs	NRCS, EPA, USGS		

Phase 3 Watershed Implementation Plan (WIP) State Programmatic Recommendations Template – Blair, Cambria, Dauphin, Fulton, Huntingdon, Juniata, Mifflin, Northumberland, Perry, Snyder, and Union County									
						Resources Needed			
Action #	Description	Performance Target(s)	Expected Timeline	Potential Implementation Challenges	Potential Recommendations on Improvement	Technical	Suggested Source	Financial	Suggested Source
1.45	NRCS shared data	Coordinate the needs of NRCS, Pennsylvania's Right to Know L, and Federal Article 1619 to improve the possibility of more shared information between agencies and their designated assigns. In order to effectively implement projects, NRCS data must be shared with on the ground implementors in coordination.	2022-2024	Right to Know law and Article 1619 present challenges with sharing data and true conservation/water quality program management. Privacy concerns with farmers information persist. Current data sharing is inadequate for WIP success.	Recommended to make changes to Right to Know and current standards of sharing information with NRCS data. Review Federal Article 1619 and draft recommendations that result in protection of data, and access to those with security clearances.	Legal review, practitioners' input, data compatibility technical review, legislative review/support			

Phase 3 Watershed Implementation Plan (WIP) Planning and Progress Template

Each county-based local area will use this template to identify:

1. Inputs – These are both existing and needed resources, public and private, to implement the identified priority initiative. These include both technical and financial resources, such as personnel, supplies, equipment and funding.

2. Process – what is each partner able to do where and by when. These are the action items listed under each priority initiative.

3. Outputs and outcomes – both short and long-term. These are the priority initiatives identified by each county. The performance targets are the intermediate indicators that will measure progress.

4. Implementation challenges – any potential issues or roadblocks to implementation that could impede outputs and outcomes

For each Priority Initiative or Program Element: Use the fields, as defined below, to identify the inputs and the process that will be followed to achieve each priority initiative. This is the "who, what, where, when and how" of the plan:

Description = What. This may include programs that address prevention, education, or as specific as planned BMP installations that will address the Priority Initiative. A programmatic or policy effort will require some ability to quantify the anticipated benefits which will allow calculation of the associated nutrient reductions.

Performance Target = How. This is an extension of the Description above. The Performance Target details the unique BMPs that will result from implementation of the Priority Initiative and serves as a benchmark to track progress in addressing the Priority Initiative. Performance Targets may be spread across multiple Responsible Parties, Geographies, and Timelines based on the specifics of the Initiative.

Responsible Party(ies) = Who. This is/are the key partner(s) who will implement the action items though outreach, assistance or funding, and who will be responsible for delivering the identified programs or practices.

Geographic Location = Where. This field identifies the geographic range of the planned implementation. This could extend to the entire county or down to a small watershed, based on the scale of the Priority Initiative, range of the Responsible Party, or planned funding/resources. *NOTE: Resource limitations alone should not limit potential implementation as additional funding may become available in the future.*

Expected Timeline = When. Provide the expected completion date for the planned activity. This should be a reasonable expectation, based on knowledge and experience, that will aid in tracking progress toward addressing the Priority Initiative.

Resources Available: Technical & Funding = This field will note technical and financial resources secured/available to implement the program (Description). This is the total of the resources identified in the County Resources Inventory Template below allocated to the priority initiative as a whole; or, if available, to each action.

Resources Needed: Technical & Funding = This field will note technical and financial resources needed/outstanding to implement the program (Description). This is the total of the additional resources projected and identified as needed in the County Resources Inventory Template below allocated to the priority initiative as a whole; or, if possible, to each action.

Potential Implementation Challenges/Issues = This field will note challenges and issues that may delay program implementation (Description)

COUNTY: Northumberland County

Detailed BMP Entry Form FINAL 9/30/2021

Sector	BMP Name	BMP Quantity	Measurement Unit	New or Total Acres
Agriculture	Soil Conservation and Water Quality Plans	25,000	acres	New Acres
Agriculture	Nutrient Management Core N	31,000	acres	New Acres
Agriculture	Nutrient Management Core P	17,500	acres	New Acres
Agriculture	Nutrient Management N Placement	2,300	acres	New Acres
Agriculture	Nutrient Management N Timing	2,300	acres	New Acres
Agriculture	Nutrient Management N Rate	2,300	acres	New Acres
Agriculture	Nutrient Management P Placement	2,300	acres	New Acres
Agriculture	Nutrient Management P Timing	2,300	acres	New Acres
Agriculture	Nutrient Management P Rate	2,300	acres	New Acres
Agriculture	Barnyard Runoff Control	49	acres	New Acres
Agriculture	Agriculture Stormwater Management	72	acres	New Acres
Agriculture	Land Retirement to Ag Open Space	205	acres	New Acres
Agriculture	Tillage Management-Conservation	7,000	acres	Total Acres
Agriculture	Tillage Management-Continuous High Residue	58,000	acres	Total Acres
Agriculture	Tillage Management-Low Residue	4,000	acres	Total Acres
Agriculture	Cover Crop Traditional Rye Normal Drilled	18,000	acres	Total Acres
Agriculture	Cover Crop Traditional with Fall Nutrients Rye Normal D	10,000	acres	Total Acres
Agriculture	Precision Intensive Rotational/Prescribed Grazing	800	acres	New
Agriculture	Off Stream Watering Without Fencing	150	acres	New
Animals	Dairy Precision Feeding and/or Forage Management	1,000	animal units	New
Animals	Animal Waste Management System	15,000	animal units	New
Agriculture	Forest Buffer	410	Acres	New
Agriculture	Forest Buffer-Streamside with Exclusion Fencing	10	Acres	New
Agriculture	Grass Buffer	62	Acres	New
Agriculture	Grass Buffer-Streamside with Exclusion Fencing	220	Acres	New
Agriculture	Tree Planting	40	acres	New
Developed	Forest Buffer	80	acres	New
Developed	Conservation Landscaping Practices	120	acres	New
Developed	Forest Planting	120	acres	New
Developed	Tree Planting - Canopy	2	acres	New

Natural	Urban Stream Restoration	10,000	feet	New
Natural	Non Urban Stream Restoration	8,000	feet	New
Natural	Forest Harvesting Practices	500	acres	New
Agriculture	Wetland Restoration - Floodplain	82	acres	New
Developed	Advanced Grey Infrastructure Nutrient Discovery Progr	190	acres treated	New
Developed	Dirt & Gravel Road Erosion & Sediment Control - Drivin	5,000	acres treated	New
Developed	Stormwater Performance Standard-Stormwater Treatm	16	acres treated	New
Developed	Impervious Surface Reduction	1	acres treated	New
Developed	Stormwater Performance Standard-Runoff Reduction	273	acres treated	New
Developed	Dry Detention Ponds and Hydrodynamic Structures	65	acres	New
Developed	Infiltration Practices w/ Sand, Veg. - A/B soils, no under	58	acres	New
Developed	Nutrient Management Plan	2,000	acres	New
Agriculture	Farmland Conservation	9,104	acres	New
Natural	Forest Conservation	1,800	acres	New
Natural	Wetland Conservation	70	acres	New

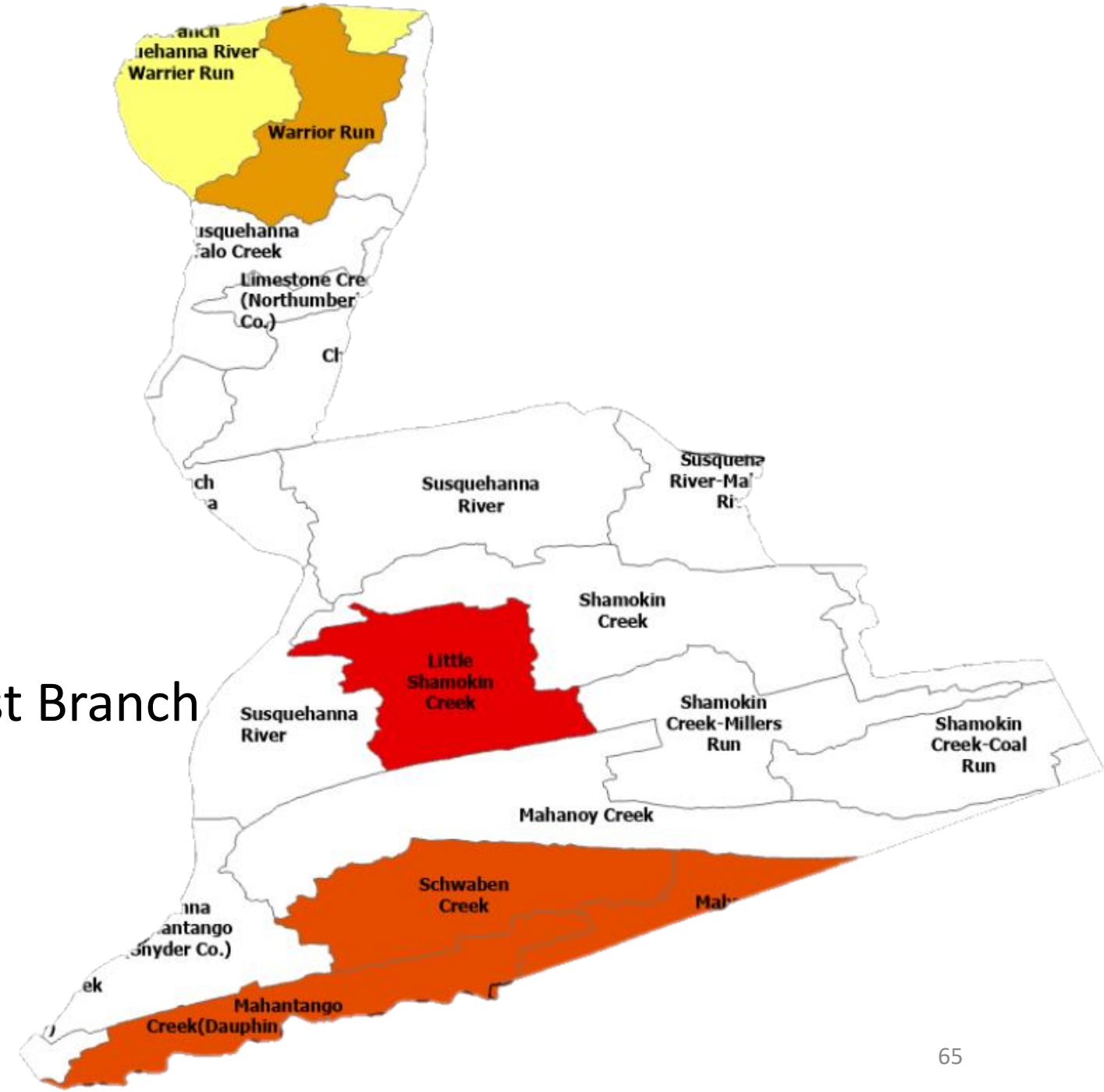
Northumberland County - Countywide Action Plan Corridors of Opportunity Analysis

- We know the Problem
  - Why -> Chesapeake Bay TMDL -> State Requirement -> County Requirement
- We are aware of Solutions
  - What -> Chesapeake Bay Non-Point Source BMPs & Planning/Assessment
- Where are the best Opportunities?
  - Where -> Locations with high source load, achieve other goals, and have engaged partners
    - ID Impaired and High Source Load Locations: TMDLs, Sparrow/CAST, Impaired Streams
    - Goals: Comp Plan Goals: Preserve, Grow, Connect
    - Partners: Watershed Associations & Third-Party Groups

HUC 12 Name	TMDL Names	Preserve	Grow	Connect	TMDL + MEB	TN	Partners	Priority Score	Priority Rank
Little Shamokin Creek	Little Shamokin Creek TMDL – D.O From agriculture runoff	3	2	2	3+1	4	1	16	1
Schwaben Creek	Schwaben Creek Watershed TMDL – Sediment from AG	2	1	3	2+1	4		13	2
Upper Mahantango Creek	Mahantango Creek TMDL – Sediment	2	1	3	2+1	4		13	2
Lower Mahantango Creek	Mahantango Creek TMDL – Sediment	2	1	3	2+1	4		13	2
Warrior Run	Warrior Run Watershed TMDL – Sediment Agriculture	2	2	3	2	3		12	3
Delaware Run – Lower West Branch Susquehanna River	Delaware Run Watershed TMDL – Sediment	2	2	2	2	4		12	3
Chillisquaque Creek – West Branch	West Branch Chillisquaque Watershed TMDL – Sediment/D.O Agriculture	2	2	2	3	3		12	3
Shamokin Creek – Coal Run	Shamokin Creek Watershed TMDL – Mine Discharge	3	2	1	1+1	2	2	12	3
Muddy Run – Lower West Branch	Muddy Run Watershed TMDL - Sediment	1	3	2	2	3		11	4
Logan Run		2	2	3		4		11	4
Shamokin Creek	Shamokin Creek Watershed TMDL – Mine Discharge	3	2	1	1+1	2	1	11	4
Susquehanna River – City of Sunbury		3	3	2		2		10	5
Upper Branches Chillisquaque	West Branch Chillisquaque Watershed TMDL – Sediment/D.O Agriculture	2	1	2	3	2		10	5
Limestone Run	Limestone Run Watershed TMDL – Sediment from Agriculture	2	3	2	2	1		10	5
West Branch Susquehanna	West Branch Susquehanna TMDL - AMD	1	3	1	1	3		9	6
Shamokin Creek – Millers Run	Shamokin Creek Watershed TMDL – Mine Discharge	1	3	1	1+1	1	1	9	6
Mahanoy Creek	Mahanoy Creek TMDL	3	1	1	1+1	1	1	9	6
Fidlers Run – Susquehanna River		3	1	1		1		6	7
Hallowing Run - Susquehanna		1	3	1		1		6	7

Top 6 Priority Watersheds Based on ranking system

- Little Shamokin Creek
- Schwaben Creek
- Upper Mahantango
- Lower Mahantango
- Warrior Run
- Delaware Run – Lower West Branch

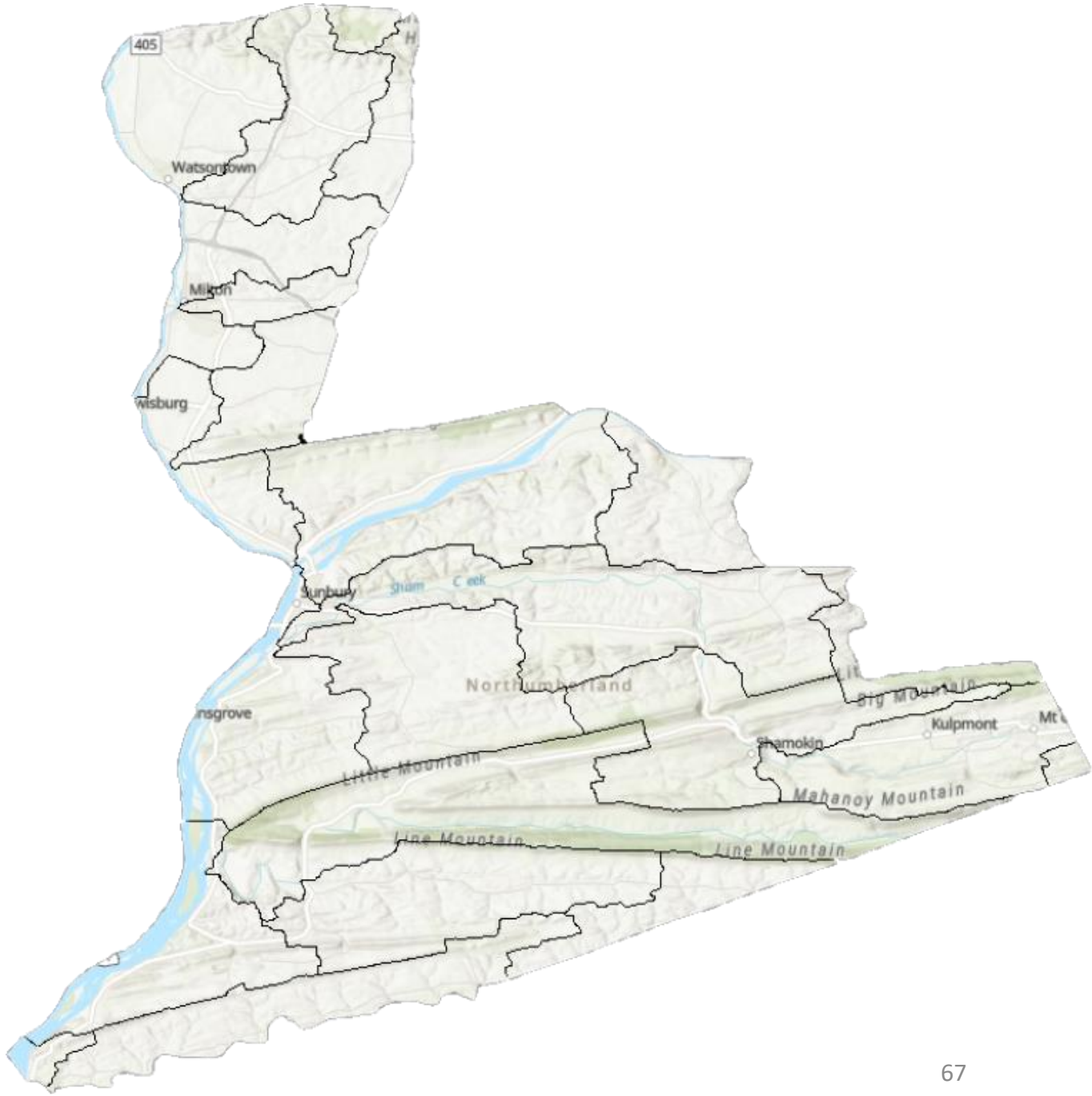


COO Prioritization Scores

- Preserve: Preserve existing resources and land use
  - Forest Preservation = +3
  - Agriculture Preservation = +2
  - Developed Areas = +1
- Grow: Opportunities and proximity to existing infrastructure and developed areas
  - Proximity to existing infrastructure top 1/3rd +3, middle 1/3rd +2, bottom 1/3rd +1.
- Connect: Connecting CAP goals with existing land use and available opportunities
  - Opportunities for BMP implementation top 1/3rd +3, middle 1/3rd +2, bottom 1/3rd +1.
- TMDLS & MEB: No TMDL = 0, AMD = +1, Sediment =+2, Sediment + Others= +3, +1 for watersheds that fall within the NFWF Most Effective Basins (MEB)
- TN: Total Nitrogen Area Weighted Loads from Sparrow: top 25% = +4, mid-top 25% = +3, mid-lower 25% = +2, last 25%= +1
- Partners: Active Partners in Watershed = +1

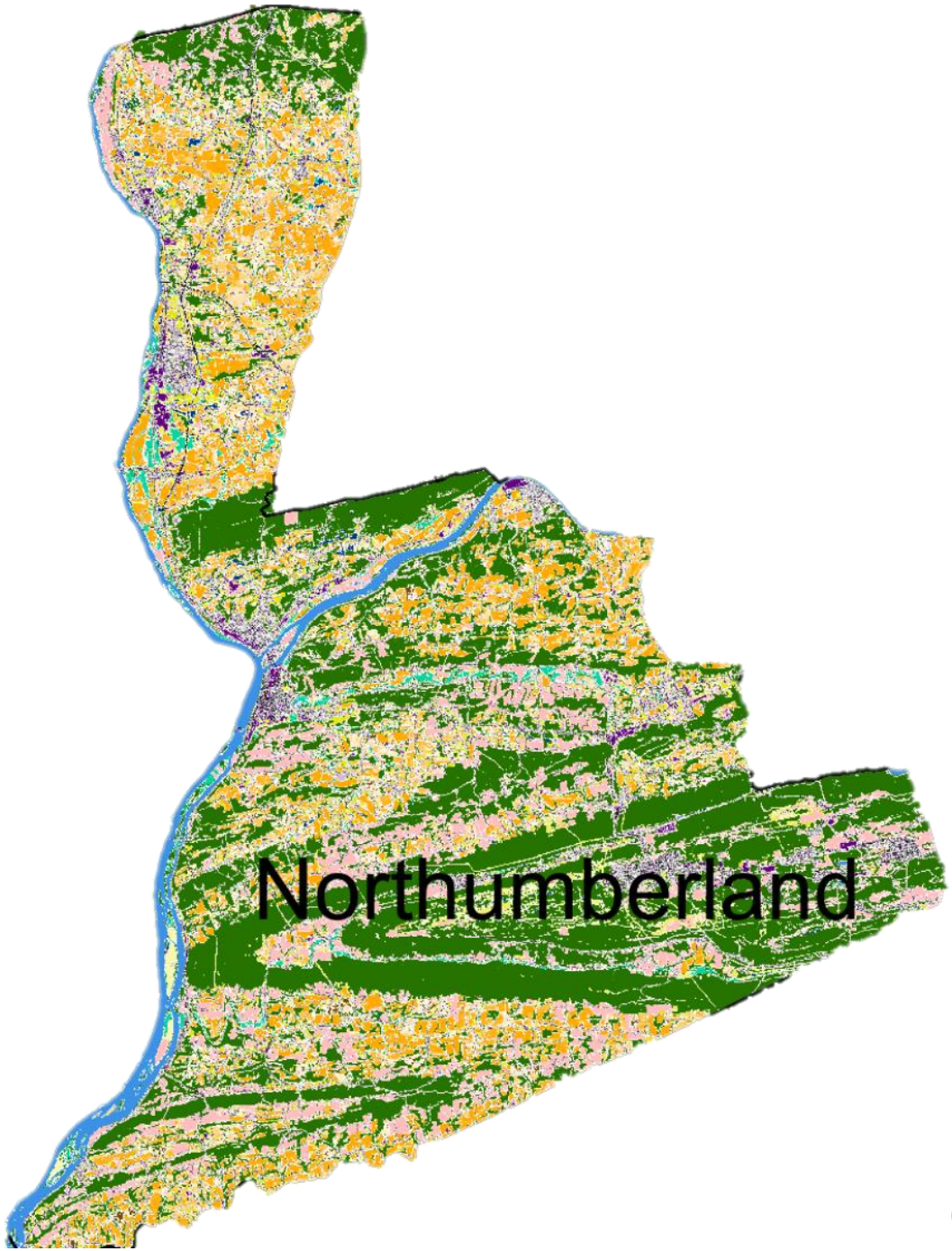
Watershed Boundaries

- Black borders represent all of the HUC-12 watersheds within Northumberland County



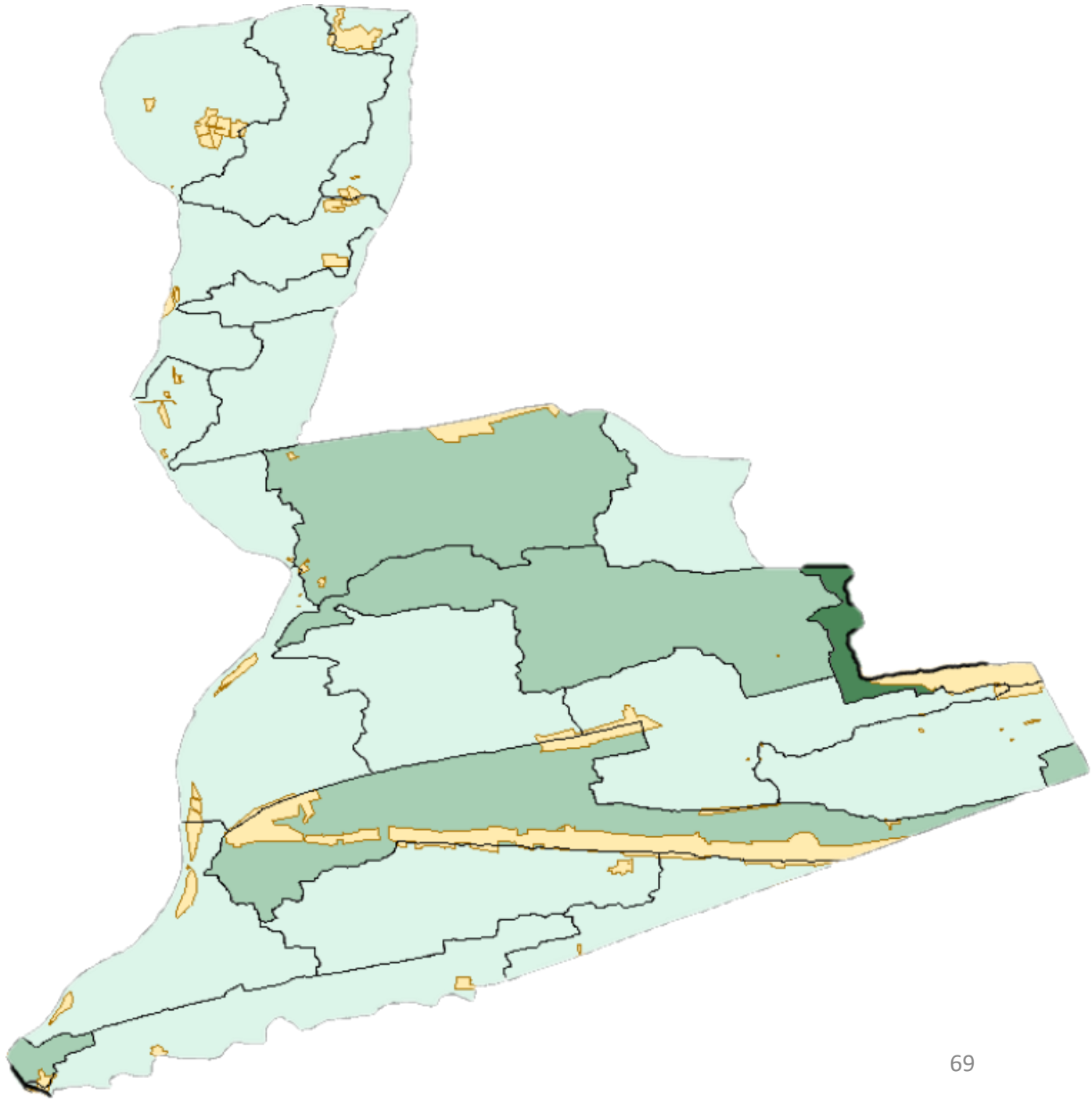
Land Use Map

- Green represents forested land
- Yellow represent agriculture land
- Tan/white represents open space
- Purple represents developed land
- Blue represents water bodies



Land Preservation Opportunities

- Yellow represents existing protected forested lands
- Shades of green represent conservation protection scores based on Chesapeake Bay Workgroup evaluation. Darker shades represent highest priority for preservation.

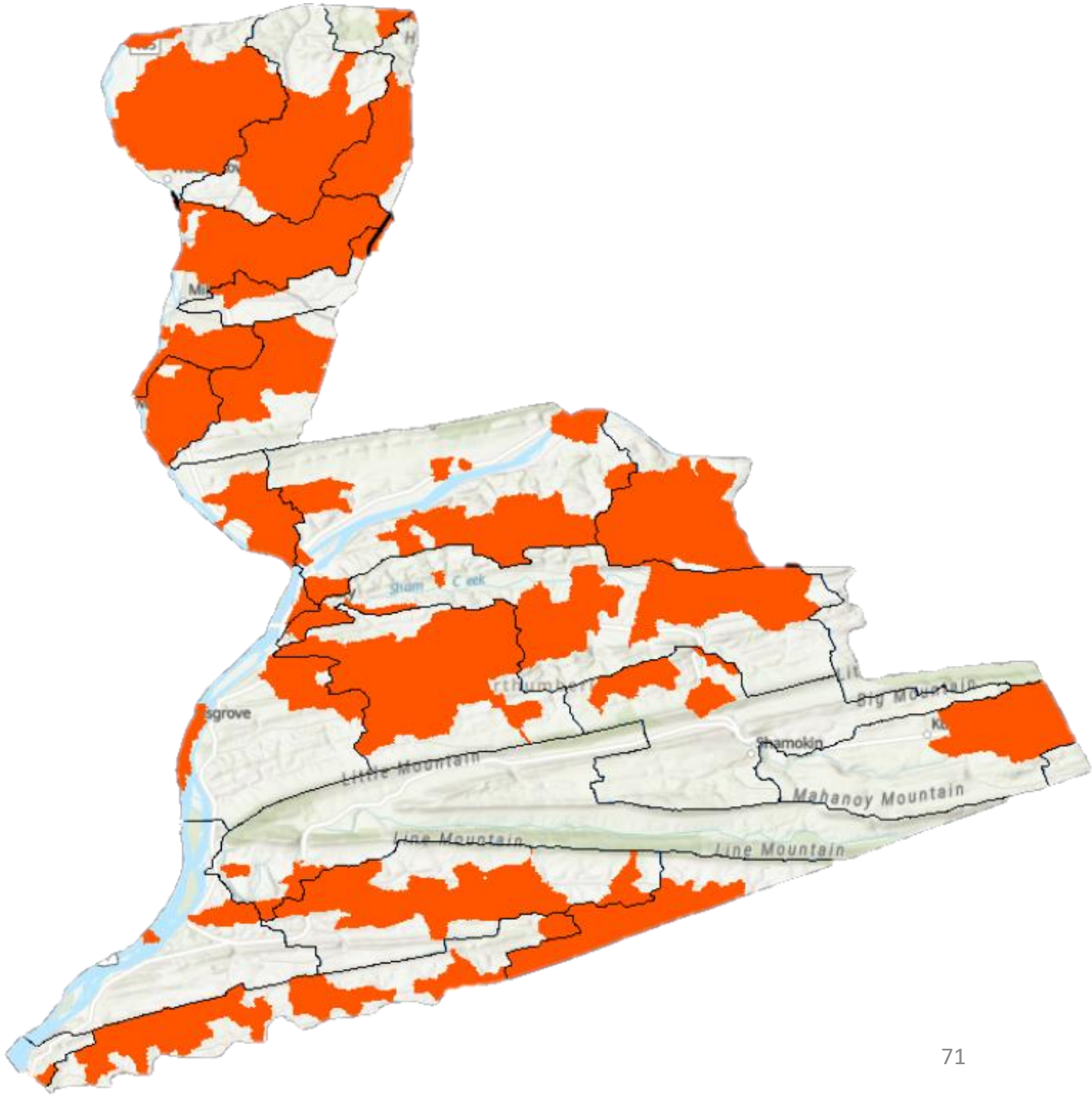


TMDLs

- Brown stream segments represent watersheds that currently have a TMDL in Northumberland County

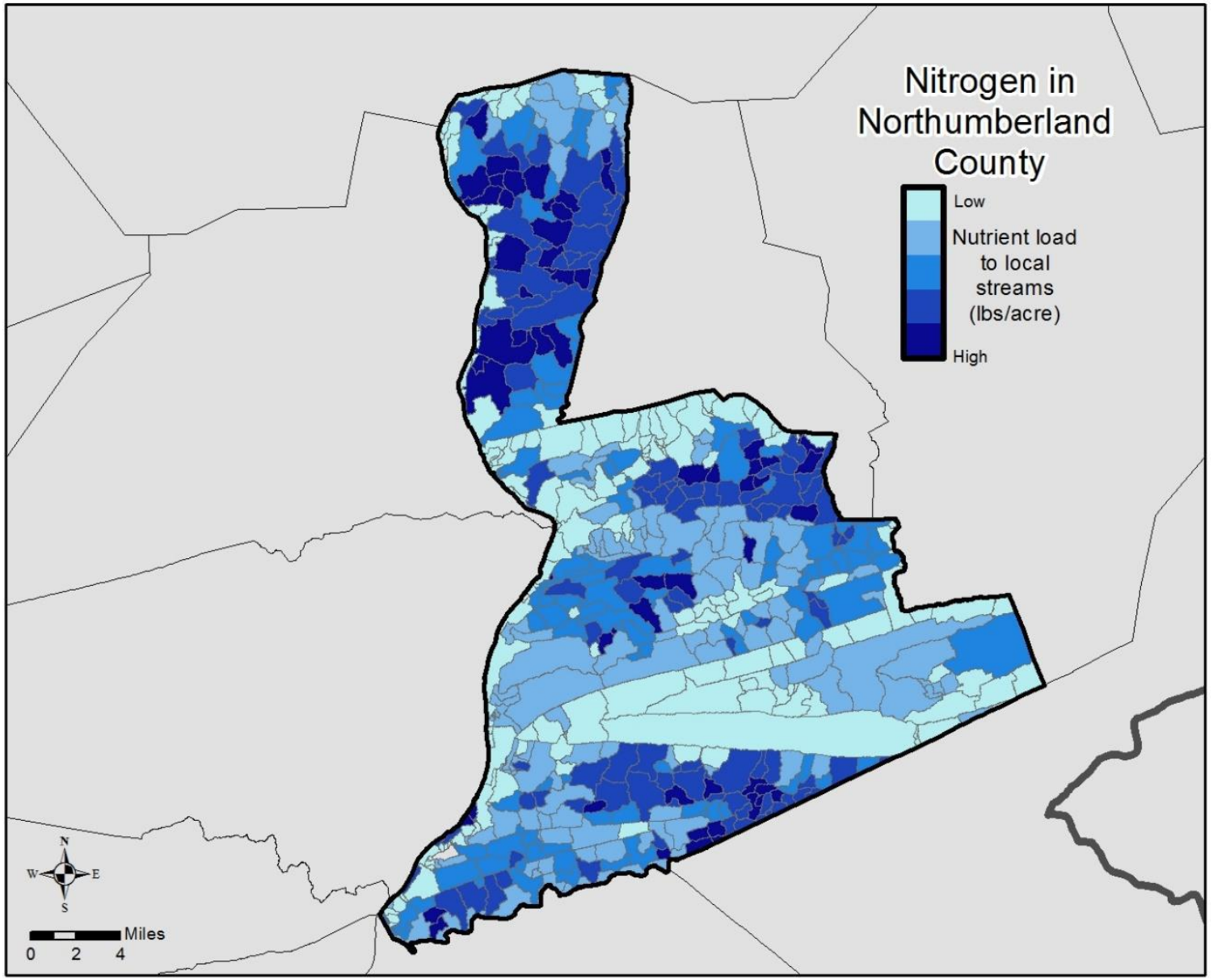
Nitrogen Loading Rates

- Orange areas represent the top 25% highest nitrogen loading watersheds in the Chesapeake Bay Watershed in Northumberland County



Nitrogen Loading Rates

- The darker blue represent higher loading watersheds



HRG
Herbert, Rowland & Grubic, Inc.
Engineering & Related Services
AN EMPLOYEE-OWNED COMPANY

NCCD

County of Northumberland

NORTHUMBERLAND COUNTY COUNTYWIDE ACTION PLAN (CAP)

The Countywide Action Plan is a collaborative plan devoted to improving and restoring the regions streams and rivers, increasing opportunities for recreation, promoting farm sustainability and improving the health of local communities. Working together, partners throughout the region have come together to identify what efforts can be accomplished over the next four years to improve the health of our local streams.

This plan provides the opportunity to work with local governments, farmers, water authorities and private industries to promote long term sustainability and healthy waters. We have identified what resources state and federal partners can assist in providing in order to achieve our goals related to our local streams.

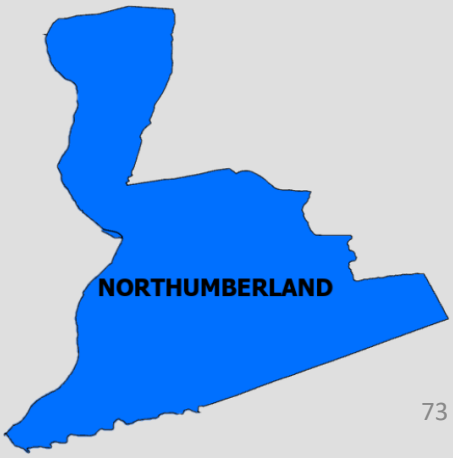
Together we can clean up and improve the health of the water we all enjoy.

40+

Local community members were involved with plan development

25+

New job opportunities are proposed to support with implementation



NORTHUMBERLAND COUNTY COUNTYWIDE ACTION PLAN (CAP)

What are the priority initiatives that improve water quality?

The Countywide Action Plan identifies many Best Management Practices (BMPs) that help improve water quality. Below are the five most cost effective BMPs that improve our local streams.

Cover Crops help to improve soil stability and soil health in agricultural operations. Increasing cover crops not only benefits water quality, but also helps to increase overall productivity of crop fields and long-term soil health. Cover crops can be incentivized through payment programs and continued education/outreach.

Agriculture Conservation or Agricultural E&S Plans are required by state and federal regulation when disturbing more than 5,000 sq feet of soil. Agriculture Conservation Plans are a great way to plan for long-term farm sustainability and improve economic benefits through conservation practices. Conservation Districts and USDA's Natural Resources Conservation Service (NRCS) support by writing Ag E&S and Conservation Plans, along with private sector plan writers.

Nutrient Management or Manure Management Plans are required by state and federal regulation for farmers and landowners who have livestock animals. Nutrient Management Plans help with properly applying animal manure to cropland while maximizing the benefits to soil health. Conservation Districts and NRCS, and private sector plan writers are available to develop Nutrient Management and Manure Management Plans.

Forest and grass riparian buffers are excellent ways to address flooding and provide additional habitat for wildlife. Buffers help to provide vital shade for instream life, while also filtering nutrients and sediment from stormwater runoff. Various existing programs help to fund the implementation of riparian buffers while paying incentives to landowners willing to implement them.

Manure storage tanks are an excellent way to properly store manure until croplands are in need of nutrients. Manure pits, stacking pads, and in-barn systems are a few examples of ways to properly store manure. Manure storage structures are effective when sized according to a Nutrient Management or Manure Management Plan. Many cost share programs are available to assist with funding the design and construction of properly sized manure storage facilities.

Are you interested in becoming involved?

For additional information please visit https://www.nccdpa.org/homeowners-checklist-for-a-watershed-friendly-home/. If you would like to become involved in our process, please fill out the survey and we will be in contact with you.