Lycoming County's Implementation Plan For the Chesapeake Bay Tributary Strategy

The Lycoming County Conservation District's Board of Directors approved this version of the Lycoming County Implementation Plan for the Chesapeake Bay Tributary Strategy during their *March 17, 2009* meeting.

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County Description

Lycoming County is located in north-central Pennsylvania entirely within the Chesapeake Bay Watershed. There are two distinct geomorphic provinces within the County – the Appalachian Plateau Province located in the northern part of the County and the Valley and Ridge Province in the south. The west branch of the Susquehanna River flows through the county, coming in at Jersey Shore and exiting below Montgomery. At 1215.5 square miles it is the largest county in the Commonwealth and is home to approximately 120,000 people. Roughly seventy-five percent of the County is forested. Agricultural land use accounts for approximately 17 percent of the County's total acreage and is the second largest land use category in the County. Twenty-two townships currently have agricultural security areas. Farming is the major industry in the county with 1,085 farms comprising 145,500 acres. There are 500 cattle farms, 140 dairy operations, 45 hog operations, 50 sheep operations, and 61 poultry operations. About 18,000 acres is used for permanent pasture. According to the 2006 Crop Summary there were 35,600 acres of forage crops, 24,300 acres of corn, 8,000 acres of soybeans, 5,000 acres of small grains, (and 1,106 acres of vegetable crops planted in Lycoming County (Pennsylvania Agricultural Statistics 2002-2003).

In addition to the West Branch of the Susquehanna and its tributaries there are six major watersheds in Lycoming County; Pine Creek (9-A), Lycoming Creek/Larry's Creek/Antes Creek (10-A), Loyalsock Creek (10-B), White Deer Hole Creek (10C), Muncy Creek (10-D) and Fishing Creek (5C). There is approximately 2,200 miles of streams and 92 water bodies in the County. Roughly 11 % (235.8 miles) of the streams located in the County are listed as impaired. Atmospheric Deposition (69.2 mi.), followed by Agriculturally Related Activities (52.0 mi), Small Residential Runoff (34.4 mi.) and Acid Mine Drainage (20.7 mi) are the known causes of impairment. There are also 59.5 miles of impairment with unknown sources.

The population trends of Lycoming County municipalities over the 1970 to 2000 Census periods are indicative of statewide trends where population shifted outward from the cities and boroughs into the suburban and rural townships. Spatially, much of the growth is occurring in the townships located just beyond the suburban fringe of greater Williamsport, which is well within commuting distance. Earth disturbance activity associated with construction has the potential to impact water quality and increases the impervious area resulting in elevated stormwater runoff rates. Development rights of 54 farms totaling 7,220 acres have been purchased through the Conservation District for farmland preservation. The Northcentral Pennsylvania Conservancy is another organization that is working to protect the rural nature of the County. Their mission is to conserve, protect and utilize lands, landmarks, and waterways of special natural, cultural and historic value for the enjoyment and well being of present and future generations. To date they have protected 19 properties in Lycoming County totaling over 1,720 acres.

Past Accomplishments

The Conservation District has completed 32 Chesapeake Bay projects at a cost of $674,031.11. Under the Nutrient Management Implementation Grant Program and Growing Greener Program the District has assisted agriculture operators in obtaining approximately $369,000. The types of Best Management Practices (BMPs) installed include manure storage structures, heavy use area protection, milkhouse waste treatment systems, roof runoff control structures, diversions, waterways, walkways, stream bank fencing, spring development, contour strips, conservation tillage and stream bank stabilization projects. Other Growing Greener grants administered in Lycoming County include water quality inventories and assessments, acid mine drainage treatment, development of Watershed Restoration Plans and stream restoration projects. Over 1.5 million dollars have been spent in these efforts.

The District has 12 active Chesapeake Bay contracts requiring compliance inspection to determine if the operations are maintaining the Best Management Practices that were installed under the Program. There are 28 farming operations that have Act 38 nutrient management plans developed in Lycoming County. The District is responsible to determine if the plans are accurate and being implemented.

The Chesapeake Bay Foundation has funded six projects to install 18,748 ft of steam bank buffers and 4.3 acres of wetlands buffered further than 15 feet from the stream. The USDA NRCS has helped to pay for the installation of, or worked with landowners to plan for the installation of 121,362 feet of fencing, 5,593.7 acres of filter strips, 861.0 acres of riparian forest buffers, 6.0 acres of wetland restoration, 42 watering facilities, and16 stream crossings through its various programs since 2004. Most of this was done through the Conservation Reserve enhancement Program (CREP). In addition to this work, the USDA also helped farmers in Lycoming County improve water quality by installing 1935 acres of contour farming, 36.1 acres of contour buffer strips, 750 feet of diversions, 26.5 acres of grassed waterways, seven roof runoff structures. They also helped implement 1410.3 acres of cover crop, 2,384.8 acres of pest management, 5,455 of conservation crop rotation, 570.0 acres of hay and pasture plantings, 371.7 acres of prescribed grazing, and 729.1 acres of forest stand improvement.

Various other public agencies and organizations are currently working for the protection and restoration of the County's watersheds. The Lycoming County Conservation District is actively involved in both waterway protection and Erosion and Sedimentation Pollution Control programs. There are nine active watershed associations in Lycoming County; Pine Creek Preservation, Pine Creek Watershed Council, Greater Nippenose Valley Watershed Association, Larrys Creek Watershed Association, Lycoming Creek Watershed Association, Rose Valley/ Mill Creek Watershed Association, Loyalsock Creek Watershed Association, Muncy Creek Watershed Association, and Black Hole Creek Watershed Association. The Clean Water Institute of Lycoming College has been very active in the assessment of the water quality in the County. The Susquehanna Chapter of PA Trout Unlimited, The Northcentral Pennsylvania Conservancy, and the Susquehanna River Basin Commission (SRBC) are also active in Lycoming County.

Previously, the County completed a system-wide investigation of Combined Sewer Overflow (CSO) in the Williamsport Sanitary Authority (WSA) sewer service

area. Known as the Lycoming County Comprehensive Combined Sewer Overflow (CSO) Study, it is a series of nine related projects that will be integrated into a single comprehensive analysis of the WSA area. As a result of this study, the Lycoming County Planning Commission was able to obtain $2.6 million dollars in grants. The grant funding was used to map the CSO in the WSA sewer service area, to complete a combined demonstration project that included a comprehensive study on overflow stormwater treatment options, and to make system upgrades to the existing CSO in Duboistown. Upgrades are continuing to be made in Old Lycoming Township, South Williamsport, and Loyalsock Township.

Impaired Waters of Lycoming County

The following are the streams listed on the *2010 Pennsylvania Integrated Water Quality Monitoring and Assessment Report (formerly the 303d list)* found in Lycoming County.

Lycoming /Larry's /Antes Creeks (10-A) – Total miles of impaired streams = 123.6

Atmospheric Deposition (Total – 69.2 miles)

- Abbott Run (and Unt) – 5.9 mi
- Doe Run (and Unt) – 4.9 mi
- First Fork Larry's Creek (and Unt) – 5.1 mi
- Frozen Run (and Unt) – 14.6 mi
- Hickory Swale – 0.8 mi
- Hound Run (and Unt) – 5.7mi
- Jacobs Hollow (and Unt) – 0.6 mi
- Long Run (and Unt) – 8.0 mi
- Lycoming Creek (and Unt) – 0.9 mi
- Mill Hollow Run – 1.2 mi
- Miners Run (and Unt) 6.4 mi
- Red Run (and Unt) – 13.1 mi.
- Yellow Dog Run (and Unt) – 2.0 mi

Abandoned Mine Drainage/Metals (Total – 13.2 miles)

- Little Gap Run (and Unt) – 7.4 mi
- Lycoming Creek (and Unt) – 2.9 mi
- Roaring Run (and Unt) – 2.9 mi

Agriculturally Related (Total – 25.2 miles)

- Beautys Run (Unt) – 3.2 mi
- Bottle Run – 4.5 mi
- Stony Gap Run- 2.1 mi.
- Little Pine Run (and Unt) – 8.9 mi
- West Branch Susquehanna River (and Unt) – 6.5 mi

Small Residential Runoff (Total – 16.0 miles)

- Bottle Run – 1.5 mi
- Daugherty Run – 12.3 mi
- Lycoming Creek (Unt) – 2.2 mi

West Branch Susquehanna River- Total miles of impairment= 53.4

Metals or PCBs- Unknown Cause (Total – 12.75 miles)

PCBs- Unknown Cause (Total – 22.25 miles)

Small Residential and Urban Runoff (Total – 18.8 miles)

- Bennetts Run- 3.1 mi.
- Fox Hollow Run – 2.2 mi
- Grafius Run (and Unt) – 8.5 mi
- Hagermans Run-1.5
- Millers Run (and Unt) – 1.2 mi
- West Branch Susquehanna River (and Unt) – 1.9 mi

Loyalsock Creek (10-B) – Total miles of impaired streams = 23.8

Mercury- Unknown Cause (Total – 23.80 miles)

- Loyalsock Creek (and Unt) – 23.8 mi

Muncy/Little Muncy Creeks (10-D) – Total miles of impaired streams = 22.0

Agriculturally Related (Total – 21.3 miles)

- Carpenters Run (and Unt) – 14.2 mi
- German Run (and Unt) – 1.8 mi
- Wolf Run (and Unt) – 5.3 mi

Unknown Cause (Total – 0.70 mile)

- Muncy Creek (and Unt) – 0.70 mi

Pine Creek (9A) – Total miles of impaired streams = 7.5

Abandoned Mine Drainage/Metals (Total – 7.5 miles)

- Buckeye Run – 4.2 mi
- Otter Run – 1.5 mi
- Right Fork Otter Run (and Unt) – 1.8 mi

White Deer Hole Creek (10-C) – Total miles of impaired streams = 5.5

Agriculturally Related (Total – 5.5 miles)

- White Deer Hole Creek – 5.5 mi

Fishing Creek (5-C) – Total miles of impaired streams = 0

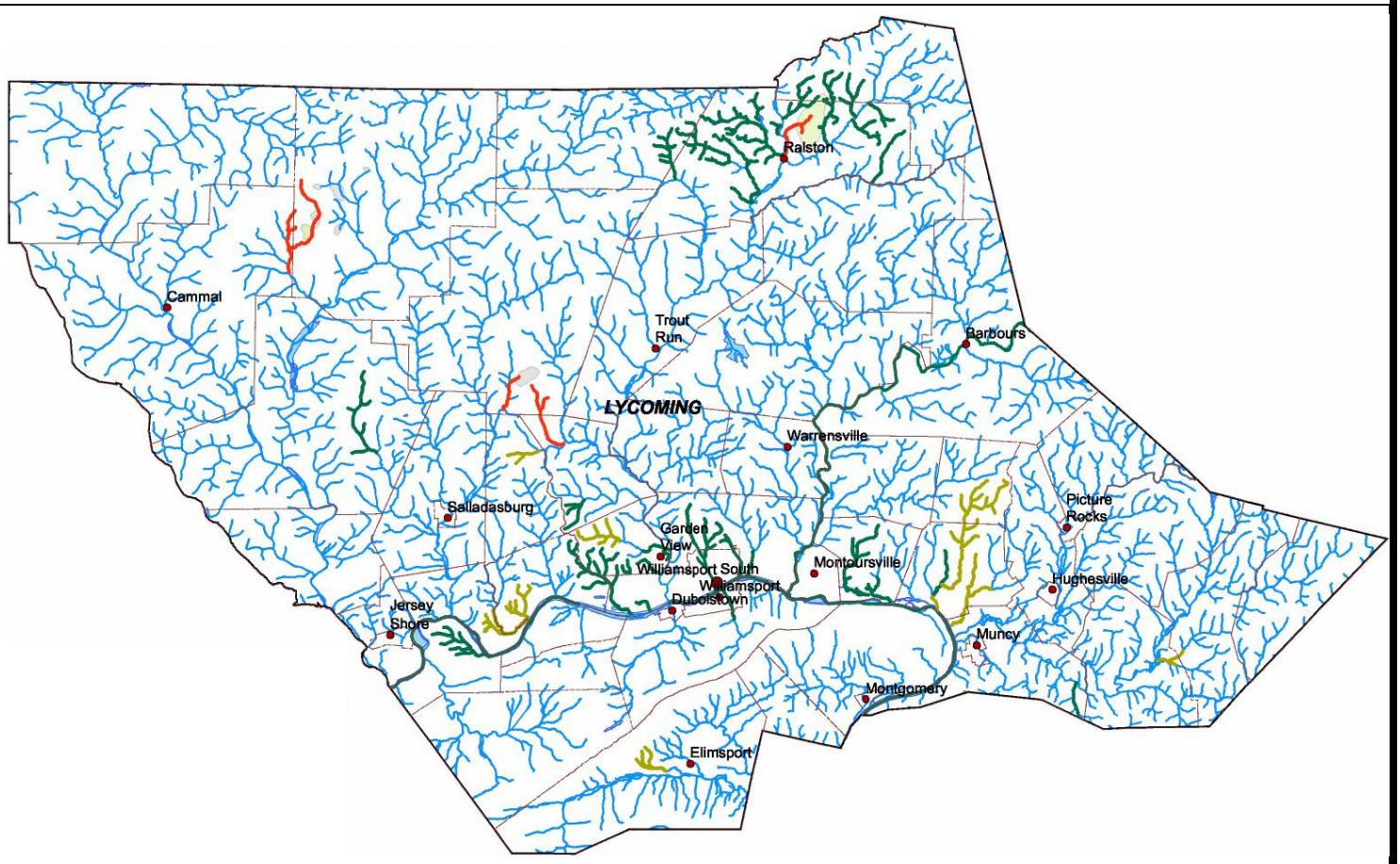
Priority Areas

Priority will be given to implementing the most cost-effective Best Management Practices to reduce nutrient and sediment runoff contributing to the impairment of the Chesapeake Bay. The Lycoming County Comprehensive Plan, the Department of Environmental Protection's *Pennsylvania Integrated Water Quality Monitoring and Assessment Report* list of impaired streams requiring Total Maximum Daily Loads (TMDLs), and the expertise of the Conservation District and its cooperating agencies will be utilized to identify project areas. TMDLs can be considered to be a watershed budget for pollutants, representing the total amount of pollutants that can be assimilated by a stream without causing impairment or water standards to be exceeded. The maximum allowable amount of a specific pollutant is allocated to all sources in the watershed, including point source discharges from sewage treatment plants and industrial wastewater facilities (waste load allocations) and polluted runoff from the land (load allocation). The TMDL process allocates the amount of pollutants that can be discharged into a waterway from each category of pollutant source. The TMDL does not specify how discharges must attain particular load reduction. TMDLs are regulatory allocations. Both TMDLs and the Tributary Strategies are developed to assist in cleaning up impaired waters. The main difference between TMDLs and the Tributary Strategies is that at this time the Chesapeake Bay Program's Tributary Strategy is a voluntary, cooperative restoration process.

The areas of Lycoming County where agriculture is currently concentrated and the greatest potential for nutrient and sediment runoff is located were identified. These target areas include Jordan, Franklin, Moreland and Penn Townships in the eastern part of the County, Limestone and Washington Townships in the southern part of the County and Cogan House Township in the north-central part of the County.

The following is a map produced by the Eastern Pennsylvania Coalition for Abandoned Mine Reclamation identifying these impairments.

STREAM CONDITIONS IN LYCOMING COUNTY: SOURCE- 2010 PENNSYLVANIA INTEGRATED WATER QUALITY MONITORING AND ASSESSMENT REPORT



Legend:

Orange= Acid Mine Drainage Impaired Streams
Tan = Agriculture Related Impaired Streams
Green= Other Impaired Streams
Blue= Non-impaired Streams

Funding and resources for this map provided by:

PA DEP 319 Program
The Foundation for Pennsylvania Watersheds

This map was published and provided by the Eastern Pennsylvania Coalition for Abandoned Mine Reclamation (EPCAMR). This map is for educational purposes only. Additional surveying may be needed for greater detail.

Technical Resources

The following resources can be utilized to implement this plan:

- Lycoming County Conservation District
- Penn State Extension
- Natural Resource Conservation Service
- Farm Service Agency
- PA Department of Environmental Protection
- Local Watershed Associations
- PA Department of Agriculture
- Eastern PA Coalition for Abandoned Mine Reclamation
- Chesapeake Bay Foundation
- Local Interest Groups i.e. -Forest Owners Association, Trout Unlimited, Sportsmen's Groups, etc.
- Local Colleges and Universities
- Custom Manure/Fertilizer Applicators
- Local Industry
- Media
- Lycoming County and PA Farm Bureaus

Funding Sources

The following can be utilized to assist in the implementation of this plan:

- Chesapeake Bay Program
- Farm Bill Programs
- PA Nutrient Management Program
- Conservation Reserve Enhancement Program
- Dirt and Gravel Road Pollution Prevention Program
- Growing Greener
- Conservation Security Program
- Farm Service Agency Loan Programs
- Miscellaneous Grants i.e. 319, National Fish and Wildlife Foundation, etc.
- Local Industry

Best Management Practices

The following Best Management Practices were identified as being the most cost-effective means of achieving the goals identified in the Bay Tributary Strategy:

- Stream bank stabilization
- Stream bank restoration
- Stream bank fencing
- Riparian buffers
- Off-stream watering systems
- Nutrient management plans
- Conservation plans/agricultural erosion and sedimentation plans
- Cover crops
- Critical area planting
- Conservation tillage/ No-Till
- Heavy use area protection
- Rotational grazing
- Land retirement
- Dirt and Gravel Roads practices

Agricultural Land Preservation Programs and Long Term Easement Programs

One of the many issues that farmers face is pressure from development. A decrease in available cropland results in higher agricultural land purchase prices for farmers in heavily developed areas. One way to prevent viable agriculture from being developed for a purpose other than for agricultural purposes is to acquire permanent conservation easements.

Purchasing these easements helps protect normal faming operations from incompatible non-farmland uses that may render farming impracticable. These programs also assure the conservation of viable agricultural lands in order to protect the agricultural economy of the Commonwealth. Normal farming operations in agricultural security areas, whether they are in an agricultural land preservation program or not, should see a decrease in public nuisance complaints by keeping development pressure off of viable agricultural lands.

The Lycoming County Conservation District administers the Lycoming County Agricultural Land Preservation Program. This program uses state and local funds to purchase permanent easements on farms located in agricultural security areas throughout Lycoming County. The conservation easements compensate landowners in viable agricultural areas in exchange for their relinquishment of the right to develop their private property.

The USDA also has a program called the Farm and Ranch Land Protection Program that helps funds permanent conservation easements on agricultural lands. Under this program, The USDA will match funds from state, local, or tribal easement programs up to 50% in order to prevent quality farmland from being converted to a use outside of agriculture. Farms enrolled in this program compete on a state wide basis for available funding.

There are several other options available to agricultural landowners who are looking for an easement or a long term rental payment for installing best management practices on their properties. One such program is the USDA's Grassland Reserve Program (GRP). Under this program, the landowner receives a one-time payment per acre. Participants are able to enroll any acreage of grassland but 20 percent of the acreage or 10acres, whichever is greater, must be managed for wildlife. This acreage may not be hayed or cut during the primary nesting season which is from April 15th until August 1st, but it may be grazed to a height of six inches in accordance with an approved grazing plan. The rest of the year, grazing and cutting the enrolled acreage is permitted as long as the participant follows the conservation and grazing management plans for the operation. Instead of an easement, participants may opt for $10 per acre rental payment for either 10, 15, or 20 years. Another program that offers both a permanent easement option and a long term rental option is the USDA's Wetland Reserve Program. This program provides financial and technical assistance to private landowners who would like to restore, protect, and enhance wetlands in exchange for retiring eligible highly erodible cropland. Instead of taking permanent easements, participants may opt for a 10 or 30 year agreement.

The USDA also administers two programs that offer long term rental payments in exchange for installing and maintaining best management practices designed address water, soil, wildlife, and other related resource concerns. These programs are the Conservation Reserve Enhancement Program (CREP) and the Conservation

Enhancement Program (CRP). Both programs offer financial and technical assistance for landowners to install low cost best management practices such as wildlife grass plantings, riparian tree plantings, stream bank fencing, off stream watering systems, and animal walkways. In addition to receiving cost funds for the implementation of these practices, landowners are paid a yearly rental rate to offset the cost of taking these areas out of agricultural production and to maintain the practices. CREP and CRP offer 10 to 15 year rental payment options.

The Northcentral Pennsylvania Conservancy (The Conservancy) is a private organization that is dedicated to the conservation of "working lands and identifying waters of Northcentral Pennsylvania for the enjoyment and well being of present and future generations". The Conservancy is an option for landowners who would like to preserve their land for natural uses in perpetuity. The Conservancy offers several land protection options through conservation easements, a land donation program, and bargain sale of land program.

Barnyard Runoff Controls

Runoff from barnyards containing manure and sediment will be reduced by installing roof water control and diversions to direct clean water away from the animal concentration area. Heavy Use Area Protection and associated runoff treatment filters will be used to armor the barnyard areas so the manure can be collected and land applied according to a nutrient management plan. Funding sources will be sought after the completion of an Act 38 Nutrient Management Plan. These sources are primarily the EQIP program and miscellaneous grants (e.g. Growing Greener).

Conservation Plans/Agricultural Erosion and Sedimentation Plans

Conservation Plans contains a farming operator's decisions regarding the conservation system being used when producing agricultural commodity crops on highly erodible cropland. A conservation plan is a document that describes the conservation system to be applied, documents the status of system application, describes the decisions of the person with respect to location, land use, tillage systems, and conservation treatment measures and schedules. In order to participate in a USDA cost share program or a USDA payment program, an operator must have a conservation plan.

All farming operations in PA that till or do no-till on 5,000 square feet of soil are required to have an agricultural erosion and sedimentation plan (Ag E&S plan) according to Pennsylvania Code's Title 25, Chapter 102. An Ag E&S plan is a water quality planning tool that is similar to a conservation plan. A conservation plan will be considered sufficient to meet this requirement if the tolerable soil loss, "T", for a field is met throughout the typical crop rotation of that operation.

Cover Crops

The District will promote the benefits of using cover crops. Nutrients left in the soil after a crop is harvested can be captured by planting small grains without fertilizer on land usually left fallow over winter. The benefits of establishing cover crops are erosion control, nitrate capture, atmospheric nitrogen fixation, organic matter increase, soil structure improvement, water management and weed control. To make the best use of cover crops, producers need to match the reason for using them with the characteristics of cover crop species. They also need to be knowledgeable about cover crop management.

Dirt and Gravel Road Pollution Prevention Program

Pennsylvania's Dirt & Gravel Road Maintenance Program provides dedicated and earmarked funding to eliminate stream pollution caused by dust and sediment from unpaved roads. In Lycoming County, annual requests total approximately $150,000 to install about six miles of environmentally sound maintenance practices and approved products to correct pollution problems. Current funding allows the District to allocate roughly $75,000 towards addressing three miles of impaired roads. The practices used by the Dirt and Gravel Road Program in Lycoming County primarily include the placement of Driving Surface Aggregate (DSA) and construction of water control structures. The Conservation District would need an additional $75,000 to address all the requests currently received each year. At this time a method of calculating the nutrient and sediment reductions form implementing these practices has not been established.

Managed Precision Agriculture

Crop Management Associations (CMAs) are grassroots, nonprofit organizations run by member farmers. Their ultimate goal is to promote more economical, efficient and environmentally sound crop production practices through best management practices and crop input efficiencies. To accomplish this, members generate funds through acreage fees and hire crop management scouts, technicians and consultants to provide a variety of services. Efficient crop production requires managing the many variables that go into growing a crop, which takes time and effort. For CMA members, much of this work is done by the association's employees: personnel, who have a background in agronomy, stay up-to-date on crop management practices and work with county extension agents who have close links to agricultural research at Penn State. Membership in a crop management association makes farmers better equipped to produce crops more profitably because members get the information needed to make sound management decisions. Crop management technicians gather and help interpret information about members' field and crop conditions. For example, technicians monitor crops for destructive insects and offer advice on control measures. Instead of routinely applying pesticides, CMA members can cut back on applications by spraying only when insect populations justify it. This saves money and protects the environment. As a result of insect monitoring information alone, one CMA member reduced chemical, equipment and labor costs by 75 percent.

Nutrient management is another area where CMAs can provide assistance. As a first step, CMA technicians collect soil and manure samples for analysis. After determining crop nutrient needs, soil fertility levels and available nutrients in farm manure, technicians advise members on the application of manure and commercial fertilizer. The goal is to meet a crop's nutrient needs without applying excess nutrients that decrease farm profits and degrade water quality.

No-till Farming

The District will promote the used of no-till farming practices. The environmental benefits of switching to no-till farming from conventional tillage practices are decreased soil erosion, increased water quality, and decreased amounts of fossil fuels and carbon gasses being released into the atmosphere. No-till farming will benefit the health of the soil by increasing soil tilth and water infiltration, while decreasing soil compaction.

In addition to the environmental benefits that farmers will gain by switching to no-till farming, they will also see a decrease in labor requirements and machinery war from not having to plow their fields. This will lead to increased time to do other necessary farm related duties and decreased fuel costs.

Nutrient Management Planning

Under current regulations, every farm operation in the Commonwealth of Pennsylvania that generates or uses manure is required to have a manure management plan (MMP). An MMP is a water quality document that states how much manure is created or used on the operation. It also details how the manure is to be applied in terms of season and amounts.

One form of documentation that is considered sufficient to meet the requirements of an MMP is the Nutrient Balance Sheet (NBS) from the PA Nutrient Management Program (Act 38). A NBS is basically a nutrient budget for a particular group of fields that have the same crop rotations, manure and chemical fertilization patterns, and tillage practices. It includes residual nutrients form past crops and manure applications, as well as nutrients that will be received from future manure and/or nutrient applications.

Some farm operations are regulated to have an Act 38 NMP. These operations contain at least 2,000 pounds of live animal weight per acre for every acre that the operator controls. Acres under control are those that the operator has the final decision making responsibility for crops and manure application. This includes both owned and rented acres.

An Act 38 NMP is more detailed than an NBS. An NMP is broken down into individual fields or a grouping of similar fields or strips know as a Crop Management Area. Each crop management area is restricted to less than 20 acres. A single NBS could cover an entire farm. Farming operations that are not required by regulation to create an Act 38 NMP may create one anyway. Having an Act 38 NMP gives an operator limited legal protection if the NMP is being implemented as it was written if the operation has an accidental discharge. In that circumstance, the legal entity will consider their efforts of developing and following an approved plan.

The Lycoming County conservation District oversees the Nutrient Management Program in Lycoming County. The district encourages every operation to create a nutrient management plan as tool to help farmers utilize their manure in an environmentally friendly way. Proper manure management may also lead to increased farm profit by not spending unnecessary money on chemical fertilizers and by applying manure in a more agronomically efficient manner.

Nutrient Trading

Nutrient trading is a process that allows point source pollution creator to buy credits for a non-point source pollution creator. In order to sell credits, the credit generator must be meeting and exceeding the minimum laws and regulations of the Commonwealth of Pennsylvania. Currently, agricultural operations are the only non-point source pollution creators that have the possibility of selling nutrient trading credits. As credit generation standards are created this will open up to other non-point source areas.

In Lycoming County, a countywide approach to nutrient trading is being pursued. This is being done as a way to allow the seven waste water treatment plants (WWTPs) in the county to achieve the upgrades that they are required to make to achieve the required pollution limits set forth in the Chesapeake Bay cleanup at a potentially reduced cost. Through nutrient trading, the WWTPs will decide individually if they would benefit from purchasing nutrient trading credits. The benefit to purchasing credits is that the WWTPs can do building improvements to achieve a certain level of pollution cleanup and purchase credits for the remaining pounds of nutrients they are required to take out of the system at a cost that is reduced from just doing a complete building upgrade. For instance, the last bit of nitrogen that needs to be removed by regulation may cost the WWTPs $20.00 to remove, but they may be able to purchase nutrient credits at $4.00 to $8.00 per credit. Since one pound of nitrogen credit equals one pound of nitrogen saved from entering the local waterways, the WWTPs would be saving $12.00 to $16.00 per pound of nitrogen for each credit that was purchased that year. This savings is then passed on to the users of the WWTPs since their operation costs remain lower.

In the case of the Lycoming County Nutrient Trading Program, it is hoped that all the credits needed by the seven WWTPs in Lycoming County would be generated by farming operations in Lycoming County. This would save sewer and water system rate payers in Lycoming County money. It would also provide extra farm income for farmers in Lycoming County.

The role of the conservation district is to promote the nutrient trading program to the farmers in Lycoming County. The district will also do the work needed to verify the existence nutrient credits on these farms. The district will also calculate the amount of credits available on participating farms and forward that information form verification to DEP. They will also serve as a point of contact for DEP while DEP is working to certify the credits for future sale. Conservation district staff members will also serve on workgroups and advisory committees associated with the Lycoming County Nutrient Trading Program.

The Lycoming County Planning Commission was able to obtain a grant through the National Fish and Wildlife Foundation to help with the start up of the Lycoming County Nutrient Trading Program. The conservation district will oversee the activities of a no-till drill rental program, a cover crop incentive payment program, and a no-till incentive payment program to comply with the guidelines of this grant.

Public Education

Public education was identified as a vital component to attaining nutrient and sediment reductions. The District must initially inform people of the changes that must be made in order to reduce pollution to the Waters of the Commonwealth and ultimately the Chesapeake Bay. It is essential to inform the public that everyday activities commonly perceived as minor or insignificant can have a considerable impact on water quality. Enhancing community awareness and involvement will assist in accomplishing this goal. This objective can be achieved by developing newspaper articles and newsletters, distributing brochures, conducting classroom visits, presenting workshops and through one-on-one contacts. The District will work closely with Penn State Cooperative Extension and other cooperating agencies to promote the proper utilization of our natural resources.

Stream Bank Fencing, Off Stream Watering Systems and Riparian Forest Buffers

The degradation of stream banks due to animal access is evident throughout Lycoming County resulting in sediment and nutrients entering the streams. Fencing promotes pasture management allowing the operator more control over where cattle graze. By reducing animal contact with surface water there is less potential for pollution from sediment and nutrients. There are many benefits of stream bank fencing to farm operators, local communities and the entire region. Farmers are under increasing pressure to consider how their management affects others. Stream bank fencing is a low-cost, low-maintenance management tool that protects a shared resource and maintains good public relations. The environmental benefits of excluding livestock from streams include reduction of nutrients, sediments, farm chemicals and bacteria entering the streams resulting in increased water quality.

An adequate amount of quality water is essential for efficient animal production. Therefore, animals excluded from streams will need to be provided water by other means, such as spring developments, pumps and stabilized access areas.

Allowing trees and shrubs to grow along the stream banks, also known as riparian buffers, decrease the frequency and severity of floods and increase groundwater recharge. These streamside forests are also effective in removing excess nutrients and sediment from surface runoff and shading streams to optimize light and temperature conditions for aquatic plants and animals. The roots of trees and shrubs aid in stabilizing stream banks thus reducing cut bank erosion.

There are several programs available to farm operators in Lycoming County promoting fencing and riparian buffers. Various options are available from the Chesapeake Bay Foundation (CBF), Department of Environmental Protection (DEP) and the Natural Resource Conservation Service (NRCS). The District intends to promote these programs and assist in the implementation of these buffers. The Conservation District will assist NRCS to install more than 1000 acres of Riparian Buffers and more than 400 acres of Grassed Filter Strips in Lycoming County under the Conservation Reserve Enhancement Program (CREP).

The nutrient and sediment reductions for Riparian Buffers on agricultural land includes the original landuse loading rate (e.g. pasture, conventional tillage, hay ground) minus the forest loading rate times total acres converted plus upland landuse loading rate times total acres treated times percent efficiency. The upland landuse efficiency varies by hydrologic setting. In Lycoming County the practice will be installed on Valley and Ridge –Silicicastic soils. For nitrogen every 435.5 linear feet of buffer (average width 100 feet) is estimated to treat 5 upland acres. For phosphorus and sediment every 435.5 linear feet of buffer is estimated to treat 2 upland acres of land. The efficiency rates for forest buffers are as follows: Nitrogen 44%, Phosphorus 45% and Sediment 45 %, the efficiency rates for grass buffers are as follows: Nitrogen 37%, Phosphorus 65% and Sediment 65 %. It is estimated that 90% of the forested riparian buffers will be installed on pasture ground and 10% installed on conventional tillage ground. This would compute to a reduction of about 48,196 lbs-N, 2,170 lbs-P and 511 tons of sediment. Four hundred acres of Grass buffers installed on previously conventional tillage ground would translate to a savings of about 31,706 lbs-N, 1,616 lb-P, and 697 tons of sediment.

All of these Best Management Practices are expected to perform for at least ten years and the reductions are cumulative throughout the years.

Stream Bank Stabilization and Stream Bank Restoration

Sediment from stream bank erosion is a source of non-point source water pollution. The eroded sediment that enters streams may also contain nutrients and chemicals. Once stream bank erosion enters local waterways, it can decrease a stream's water carrying capacity, leading to increased flooding during a heavy rainfall event. With approximately 2,200 miles of streams in Lycoming County, the potential for pollution occurring at individual sites with stream banks that are in need of stabilization or restoration work is great.

In an effort to keep sediment from eroded stream banks from entering local waterways, the Lycoming County Conservation District will work with interested landowners to remedy existing stream bank erosion conditions. These landowners can be owners of agricultural and non-agricultural land, as well as municipalities. This work will be done in addition to work that is currently being done through the District's cooperation with watershed associations and through the Erosion and Sedimentation Control Program.

This work would include, but not be limited to, offering technical services and trying to obtain grant funding to do stream bank stabilization and restoration projects. Types of projects that could be done through potential grant funding sources include installing stream bank fencing, sloping and vegetating stream banks, installing riparian buffers, hard armoring streams with riprap, and installing log deflectors. Other best management practices, not listed above, may be used in stream bank and restoration projects, if they are needed in addition to, or instead of, these listed practices.

Storm Water Management

Flooding has been identified as a storm water management concern. Act 167 requires counties to develop Watershed Stormwater Management Plans, and provides a mechanism for partial reimbursement from DEP, subject to availability of funds. The County completed a Comprehensive Watershed Stormwater Management Plan for the Grafius/Miller's/McClure's Run watershed in 2001. Small parts of the County are also part of the completed Chatham Run and Fishing Creek watershed Stormwater Plans.

Lycoming County Planning has secured a grant to develop a Comprehensive Stormwater Management Plan and Model Ordinance for the Lycoming Creek Watershed. This grant was amended to include a County-wide Stormwater Plan and Model Ordinance for the remainder of the County that does not have a Watershed Plan. The Ordinances differ only that the Lycoming Creek Ordinance has detailed stormwater peak retention standards that are designed to prevent increases in flood levels after the watershed has developed, based upon a detailed hydrological model that was developed as part of the Plan.

The Lycoming Creek watershed was selected mainly in response to repetitive flooding issues. We have calculated that there has been about a 43% increase in the 100 year flood level since 1938, mainly due to increased land development, roads and clearing of forested lands. The County Plan was done to provide a baseline level of Stormwater management until detailed watershed plans could be developed. There is a wide variation in the level and quality of Stormwater ordinances in the County. The MS4

communities around Williamsport, as well as Armstrong and Clinton Twps, all have comprehensive stormwater ordinances. The remaining municipalities do not have comprehensive stormwater management.

As of this date, a draft Lycoming Creek Plan and Model Ordinance has been developed and reviewed by the Lycoming and County Watershed Plan Advisory Committees (WPAC), and stakeholder groups of local engineers and builders. The Planning Commission will consider the draft Plan/Ordinance at their March, 2010 meeting, and may then recommend approval of the Lycoming Creek & Lycoming County Plans & Model Ordinance by the County Commissioners, following an advertised Public Hearing.

The Plan will then be submitted to DEP for approval, following which the municipalities will have 6 months to adopt the model ordinance (or modify their existing ordinance to be consistent with the model ordinance). The County will conduct workshops to advise municipal officials about stormwater ordinance adoption procedures, administration, and cost reimbursement from DEP. The LycomingCreek/County Plan approval process is anticipated to be completed by June 30, 2010; and municipal implementation is expected to be completed by December 31, 2010.

The Lycoming County Conservation District oversees the National Pollutant Discharge Elimination System (NPDES) permit program. NPDES permit regulations require a degree of storm water management on some projects. Persons proposing earth disturbance activities which disturb one (1) to less than five (5) acres with a point source discharge to surface waters of the commonwealth, or five (5) or more acres require an NPDES permit. The District reviews these plans and is active in educating the public and townships in their requirements.

Urban Nutrient Management

More efficient use of chemical fertilizers can be attained through the promotion of Penn State Soil Fertility Testing Program. This program is designed as a soil-management tool for farmers, homeowners, landscape contractors, golf-course superintendents, ornamental nurserymen and others interested in the fertility of their soil and in determining the optimum lime and fertilizer requirements of their crop. By better matching application rates to nutrient needs, over application of nutrients resulting in pollution can be avoided.

The over-application of commercial fertilizers to lawns is perceived as a threat to the quality of the streams of Lycoming County and the Commonwealth. Through a cooperative endeavor between the Conservation District and the Penn State Extension, a program has been created to educate the public as to the benefits of soil sampling. This has been done by conducting workshops for homeowners promoting the importance of proper soil sampling and resources available to them through the Cooperative Extension. The District provides participants with soil sample test kits they can use in order to utilize the information they learned. This benefits the public in two ways: (1) an increase in water quality (locally and in the Chesapeake Bay) and (2) a reduction in fertilizer costs. It is the assumption of this workgroup that the participants of this workshop will learn their lawns are in need of lime and not necessarily fertilizer. If 100 people attend, at $9.00 per soil test kit, the total cost of the workshop is $900.00.

There are few mechanisms for reporting the nutrient and sediment reductions from this practice. It is difficult to assign a "before" condition; urban pervious acreage actually receiving fertilizer, the amount of that fertilizer, and timing of application or the definition of the "after" condition. Another difficulty is tracking the numbers (acreage) and location in both categories over time. Nutrient reductions for this practice are as follows: Nitrogen =17%, Phosphorus = 22%. This practice is applied to mixed open land and developed land. The upland loading rates (EOS) in Lycoming County for mixed open land are 6.3 lbs-N/yr/ac and 0.50 lbs-P/yr/ac. This would compute to a reduction of 1.071 lbs-N/yr/ac and 0.11 lbs-P/yr/ac. The upland loading rates (EOS) in Lycoming County for pervious developed land are 10.6 lbs-N/yr/ac and 0.69 lbs-P/yr/ac. This would compute to a reduction of 1.802 lbs-N/yr/ac and 0.15 lbs-P/yr/ac. Assuming 100 acres of this practice were adopted it would translate into nutrient reduction of 180.2 lbs-N/yr and 15 lbs-P/yr.

Woodland Management

Lycoming County has over half a million acres of forested land in the county that have the potential to contribute pollutants to the Chesapeake Bay. The Conservation District will work with the Lycoming County Woodland Owner's Association to promote sound forest management practices. This will reduce the erosion potential resulting in sediment and nutrient losses to the waters of the Commonwealth through the proper construction of roads, trails and landings.

Currently there isn't a method for crediting this practice in the watershed model. It suffers from the same problems as urban nutrient management, i.e. what is the acreage of harvest, define its condition before/after practices are installed, where is it located, how does it change annually (location, acreage

Summary

The Lycoming County Conservation District will locate and interact with interested farm operators to address specific problems resulting in non-point source pollutants entering the waters of the Commonwealth. Runoff from barnyards containing manure and sediment will be reduced by installing roof water control and diversions to direct clean water away from the animal concentration areas. Heavy Use Area Protection and associated runoff treatment filters will be used to armor the barnyard areas so manure can be collected and land applied according to a nutrient management program developed by the District. Stream bank fencing, riparian and /or grass buffer development, cattle crossings and off-stream watering systems will be installed to reduce the accelerated erosion of the stream banks caused by unlimited cattle access. Nutrients from manure and commercial fertilizer as well as sediment leaving agricultural crop fields and pastures can be reduced by implementing an integrated management system including nutrient management and erosion control practices. Riparian buffers will be established and are effective in removing excess nutrients and sediment from surface runoff and shading streams to optimize light and temperature conditions. In addition, Conservation District staff will continue to work with watershed associations in an effort to implement environmentally sound practices to decrease the erosion potential of unstable stream banks. Any attempt at implementing a voluntary approach to restoring the waters of the

Commonwealth will have to occur in combination with increased enforcement of existing regulations.

The District will assist the Natural Resource Conservation Service in promoting, planning and installing practices under the Conservation Reserve Enhancement Program. If the goal of 1,000 acres of forest riparian buffers and 400 acres of grass buffers are established the pollutant reduction is expected to be 79,902 pounds of nitrogen (lb-N) per year, 3,786 pounds of phosphorus (lb-P) per year and 1, 208 tons of sediment per year. By 2010, a reduction of 399,510 lb-N, 18,930 lb-P and 6,040 tons of sediment is expected. In Lycoming County these practice are most commonly under contract for 15 years, the nutrient and sediment reduction over this time period would be 1,198,530 lb-N, 56,790 lb-P and 18,120 tons of sediment.

This plan was developed in cooperation with the Lycoming County Conservation District, Natural Resource Conservation Service, Farm Service Agency, Department of Environmental Protection, Penn State Extension, Lycoming County Planning Commission, Eastern Pennsylvania Coalition for Abandoned Mine Reclamation and the Chesapeake Bay Foundation in an effort to address non-point source pollution resulting from agricultural and urban/mixed open land. Information gathered to develop this plan was derived from the Lycoming County Conservation District's Strategic Plan and several workgroups recently held by the aforementioned cooperating agencies.