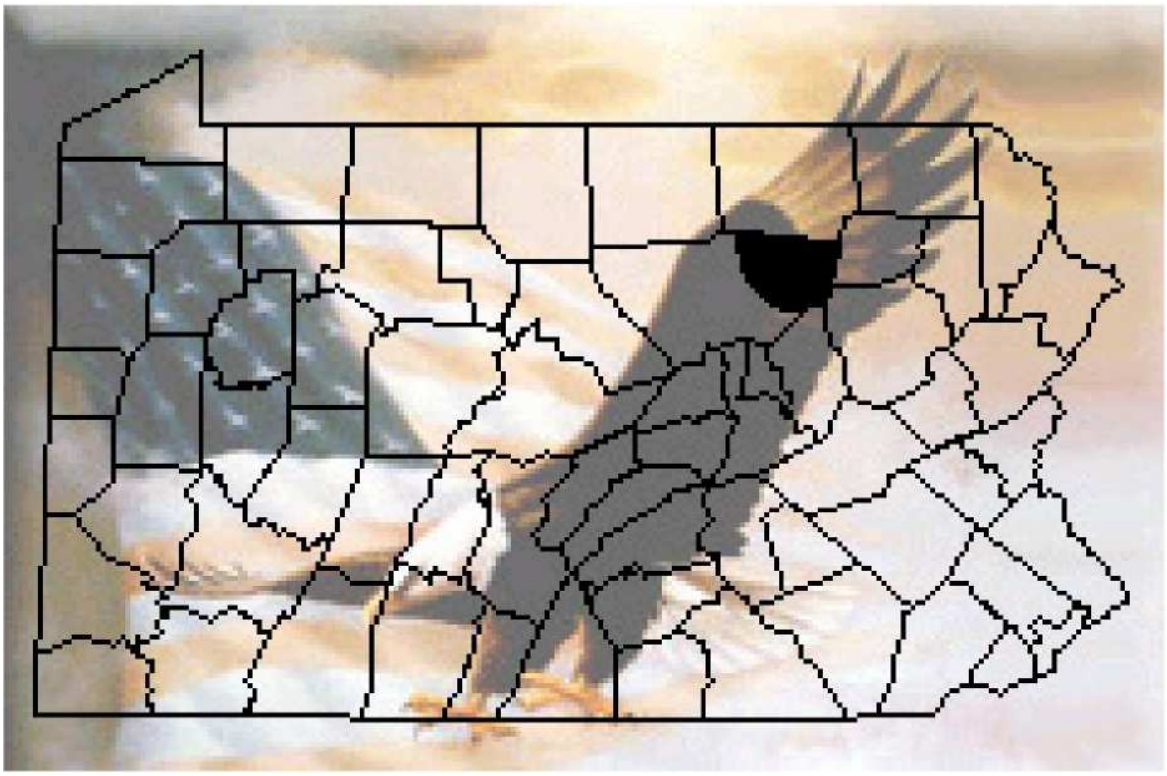
Sullivan County's Implementation Plan for the Chesapeake Bay Tributary Strategy

Prepared by the Sullivan County Conservation District



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County Description

Sullivan County is located on the Appalachian Plateau in north-central Pennsylvania. Sullivan County is 452 square miles in size and has a population of approximately 6,428 full-time residents (2010 Census). Sullivan County is one of only three places in the northeastern United States that the Federal Government considers to be entirely rural. The timber industry, agriculture, and the state and county government are the three largest employers in Sullivan County

Sullivan County's waters are in the Hydrologic Unit Code (HUC) 2050206, which are entirely in the Chesapeake Bay Watershed. Sullivan County waters fall into six major watersheds. The Loyalsock/Elk Creeks (10B) covers 67% of the County's landmass, while the Muncy/Little Muncy Creeks (10D) covers 15%, and the West Branch of Fishing Creek (5C) covers 11%. The North Branch of the Mehoopany Creek (4G), Lycoming Creek (10A), and Towanda Creek (4C) watersheds cover the remaining seven percent of Sullivan County's land mass. There are 848.94 miles of streams in Sullivan County.

Timberland covers 81% of Sullivan County (Sullivan County Land Cover Map is located in the Appendix). Over one-third of the county's 305,920 acres are owned by the State of Pennsylvania. This state owned land comprises all of World's End State Park, and part of Ricketts Glen State Park, the Loyalsock State Forest, State Game Lands Numbers 12, 13, 66, and 134, and PA Fish and Boat Commission land around Hunter's Lake.

Agriculture is the second largest land use in the County. According to the 2012 Census of Agriculture, there are 179 farms in Sullivan County, which cover 37,481 acres. There are approximately 28 beef operations, 14 dairy operations, 4 hog operations, 18 poultry operation, 22 equine, 5 alpaca, and two sheep operations. According to the USDA National Statistics Service's 2012 Census of Agriculture, there were 7,149 acres used for forage production, 2,068 acre used for corn silage production, 2,293 acres used for corn grain production, and 134 acres planted in oats.

Six of the County's nine townships have Agricultural Security Areas with greater than 500 acres enrolled. Colley Township has limited farmland and has been included in Cherry Township's plan. As of March 2014, seven tracts totaling 649 acres have had their development rights purchased through Sullivan County's Agricultural Land Preservation Program. The North Central Pennsylvania Conservancy, an organization that purchases conservation easements on land to preserve it for future enjoyment for its special natural, cultural, or historical value, has purchased one conservation easement on a 606 acre tract of land adjacent to World's End State Park. This land has since been transferred to the Bureau of Forestry to be used as State Forest Land. The conservancy has also purchased 248 acres of development rights on the Conklin Run tract, a main tributary to Lake Mokoma, and 21 acres on the Richards tract bordering Loyalsock Creek near Ringdale.

Past Accomplishments

The Chesapeake Bay Program began in Sullivan County in 1993. Since then, the Sullivan County Conservation District has completed 14 major Chesapeake Bay projects. There are nine current Chesapeake Bay Projects in the County. These projects include manure storage structures, sub-surface drains, heavy use protection areas, roof runoff structures, milk house waste treatment systems, diversions, and grassed waterways. In addition to Chesapeake Bay Program funding, the CBP Special Projects Funding, LISA, USDA, and other grant program funding has provided for stream bank fencing, off stream watering systems, pasture management, heavy use area protection, stream bank stabilization, and riparian buffer establishment projects.

The conservation district has developed a good relationship with its farm operators and continues to provide assistance in planning needs including installation of best management practices, manure management, and erosion and sediment control measures. The district continues to provide workshops and one-on-one assistance in management planning needs to these operations.

Since its inception in 1997, Sullivan County's Agricultural Land Preservation Program has purchased the development rights on seven tracts totaling 649 acres. This program has ensured that these parcels will never be used for anything other than agricultural use. There is currently one additional landowner in Sullivan County who would like to enroll his farm into the Agricultural Land Preservation Program if funding becomes available. At the current funding level, it takes two years to preserve a 50 acre tract of land.

92 projects have been completed in Sullivan County through the Dirt and Gravel Road Program since 1998. To complete these projects, the District has worked with eight townships and PennDOT in providing assistance.

The Watershed Specialist works with two watershed groups in Sullivan County. The Muncy Creek Watershed Association continues to work in restoration of the upper part of the watershed located in the county. The Loyalsock Creek Watershed Association focuses on the protection of the Loyalsock Creek, stream bank stabilization where needed, and continued funding of acid mine drainage treatment needs of three treatment systems in the upper Loyalsock near Mildred and Lopez.

The Conservation District, with the aid of the Rural Abandoned Mine Program (RAMP), the Bond Forfeiture Program, and DEP Bureau of Abandoned Mine Reclamation (BAMR), and Eastern PA Coalition of Abandoned Mine Reclamation (EPCAMR), has worked to reclaim more than 400 acres of abandoned mine land. The Sullivan County Conservation District has also worked to come up with low cost and low input measures to treat acid mine drainage. These measures include dousing streams with limestone sand, placing limestone sand in piles next to acid mine drainage areas and having rain water move the calcium carbonate into the waters where treatment is desired, and using limestone screenings to treat acid mine drainage instead of the more costly limestone sand.

Impaired Streams in Sullivan County

The following Sullivan County streams are listed on the *2011 Pennsylvania Integrated Water Quality Monitoring and Assessment Report* (formerly the 303d list).

West Branch of Fishing Creek (5C) - Total miles of impaired streams = 40.62

Atmospheric Deposition (Total miles = 40.62)

Atmospheric Deposition/Metals

East Branch Fishing Creek (and unt) - 4.64 mi.
Ore Run (and unt) - 1.11 mi.
Heberly Run (and unt) - 5.72 mi.
Sullivan Branch (and unt) - 5.06 mi.
Meeker Run (and unt) - 1.19 mi.
Hunts Run - 0.49 mi.
Pigeon Run - 1.30 mi.
Long Run (and unt) - 4.25 mi.
Big Run (and unt) - 2.52 mi.
Lead Run (and unt) - 1.84 mi.
Blackberry Run (and unt) - 2.91 mi.
Hog Run - 2.02 mi.
Trout Run (and unt) - 1.88 mi.
Elk Run (and unt) - 0.43 mi.
Peterman Run - 1.63 mi.

Atmospheric Deposition/pH

Shanty Run (and unt) - 1.84 mi.
Quinn Run - 2.26 mi.
Oxhorn Run - 1.86 mi.
Kitchen Creek (and unt) - 0.82 mi.

Loyalsock Creek/Elk Creeks (10B) - Total miles of impaired streams = 23.39

Atmospheric Deposition (Total miles = 15.5) Atmospheric Deposition/pH (Total miles = 8.26)

Wolf Run - 3.31 mi. -
Open Run - 1.91 mi.
Bear Swamp Run (and unt) - 3.04 mi.

Atmospheric Deposition/Natural Sources/pH (Total miles = 7.24)

Santee Creek (and unt) - 7.24 mi.

Abandoned Mine Drainage/Metals (Total miles = 5.6)

Loyalsock Creek - 5.6 mi.

Upstream Impoundment/Thermal Modifications (Total miles = 0.87)

Marsh Run - 0.87 mi.

Towanda Creek (4C), North Branch of Mehoopany Creek (4G), Lycoming Creek (10A), and Muncy/Little Muncy Creeks (10D) - Total miles of impaired streams = 0

Priority Areas

In an effort to reduce the water quality impairments of Sullivan County's portion of the Chesapeake Bay Watershed, priority will be given to installing the most cost effective Best Management Practices (BMPs) that reduce nutrient and sediment runoff. These BMPs will be used to reduce nutrient and sediment runoff created by Acid Mine Drainage and Agriculturally Related Practices. The Pennsylvania Department of Environmental Protection's *2011 Pennsylvania Integrated Water Quality Monitoring and Assessment Report*'s list of streams requiring Total Maximum Daily Loads (TMDLs) will be used to identify project priority areas. To gather the greatest amount of expertise and support available when planning a project, the Sullivan County Conservation District will work with its conservation partners to complete all projects.

TMDLs are pollution allocations for a particular watershed that are set by the State or the US Environmental Protection Agency. TMDLs allow for the release of pollutants into local waterways in such a way that if the TMDLs are met, the waterways having the TDMLs will not have their water quality impairments exceed the current allowable limits. TMDLs will specify the amount of pollutants that specific entities within the watershed, such as industrial plants and water treatment plants, are allowed to emit into waterways legally on any given day. TMDLs do not specify how an entity is to achieve its daily load requirement. It is the responsibility of each entity to determine how they choose to achieve the daily load requirements.

TMDLs and Tributary Strategies are both documents that have improving water quality as their main goals. Entities with TMDLs are subject to regulatory enforcement if they exceed their allocations. Tributary Strategies are documents that are designed to gain water quality improvements through voluntary actions.

Agriculture is found throughout Sullivan County, but its greatest concentration is found in Cherry, Forks, Elkland, Fox, Hillsgrove, and Davidson Townships. These seven townships are where the greatest potential for agriculturally related impairments occurs. The potential for accelerated erosion caused by land disturbances and stream bank erosion exists countywide. This is due to the steep slopes found throughout Sullivan County's topography. Abandoned mine land can be found throughout the Loyalsock Creek Watershed, but it is concentrated heaviest in southeastern Cherry Township and western Colley Township. Runoff from dirt and gravel roads is a concern that exists countywide.

Technical Resources:

The following resources can be utilized to implement this plan:

- DCNR Bureau of Forestry
- Eastern PA Coalition for Abandoned Mine Reclamation (EPCAMR)
- Endless Mountains Resource Conservation and Development Council (Endless Mountains RC&D)
- USDA Farm Service Agency
- Local Interest groups- i.e. Trout Unlimited and North Central Pennsylvania Conservancy, PA Farm Bureau
- USDA Natural Resource Conservation Service
- PA Department of Transportation
- Sullivan County Conservation District Directors and Staff
- Penn State Extension
- Township and Municipal Governments
- Watershed Associations
- PACD Technical Assistance Grant Engineers
- PA Fish and Boat Commission's Habitat Management Section

Funding Sources:

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

Act 13 Oil and Gas Monies
Agri-Link Loans
Bureau of Abandoned Mine Reclamation
Bureau of Mining
Chesapeake Bay Foundation
Chesapeake Bay Program
Conservation Reserve Enhancement Program
County Commissioners
DEP's Environmental Educational Grants
Dirt & Gravel Roads Program
EPCAMR
Environmental Quality Incentive Program (EQIP)
Farmland Preservation Program
Farm Service Agency Loan Programs
Forest Land Enhancement Program
Growing Greener
Stream ReLeaf Program
Office of Surface Mining
PACD TAG Assistance
Section 319 Grants
USDA Program Assistance to Farmers
Wildlife Habitat Incentives Program (WHIP)
Water Resources Education Network (WREN) Project Grants
Watershed Associations

Best Management Practices:

The following Best Management Practices were identified as practical practices that can be used to achieve the goals of Sullivan County's Bay Tributary Strategy.

Acid Mine Drainage Treatment
Advanced Nitrogen Management for Corn
Agricultural Compliance
Barnyard Runoff Control
Conservation Planning/Soil Sampling
Conservation Tillage/No-till
Cover Crops
Educational Awareness
Erosion Reduction in Delegation Programs
Farmland Preservation
Forest Management
Land Reclamation
Manure Storage Facilities
Manure Spreader Calibration
Manure Management Planning
Nutrient Management Planning (Outsource)
Off Stream Watering Systems (including solar powered)
Preservation of Wetland Habitats Riparian Buffers
Roof Runoff Management Systems
Soil Test Sampling
Stream and stream bank improvements
Stream Bank Fencing
Stream Bank Restoration
Stream Bank Stabilization
Water Quality Monitoring
Wetland Creation
Wetland Restoration

Pollution Reduction Strategies for Sullivan County

Agricultural Compliance

Currently, Pennsylvania has regulations requiring farm operations to have a manure management plan and an erosion and sedimentation plan (E & S plan) if certain criteria are met. These regulations are subject to enforcement by PA Department of Environmental Protection. One of the goals of the Sullivan County Conservation District is to work with the local agricultural community to achieve full compliance on each farm in the areas of manure management and erosion and sedimentation control.

According to PA Code Title 25, Chapter 102, all farmland in Pennsylvania that has over 5000 square feet (0.1 acre) of land plowed or tilled per year is required to have a written E & S plan. The E & S plan must show that the farmland is not losing soil at a rate greater than natural soil loss. A current conservation plan that shows that the tolerable soil loss, "T", is being met is acceptable. These plans are also required if a farm operation has an identifiable Animal Concentration Area (ACA). The district continues to work towards 100% achievement of county farms meeting the minimum compliance standards for Pennsylvania.

According to PA Code Title 25, Chapter 93, all farming operation that produce manure must have a manure management plan or a nutrient management plan. A manure management plan is simply a document that shows how much manure is produced by an operation and how that manure is handled. Nutrient management plans are usually only needed if the operation is a Concentrated Animal Operation (CAO). A CAO is an operation that has over 2,000 pounds of live weight of animal for every one acre of land where manure can be applied. Additionally, all farming operations that produce or use manure are required to follow applicable guidelines found in the Manure Management Manual. These guidelines cover manure handling, manure application practices, and best management practices needed to protect water quality.

The conservation district continues to provide education and outreach for both erosion and sedimentation control and manure management planning through individual farm visits and hosting of workshops that will encourage and allow farmers to develop their own manure management and erosion and sedimentation control plans. It is a goal of the conservation district to make use of a portion of the annual Act 13 funds received to be used in implementing practices on county farms for further compliance to state and federal regulations pertaining to agriculture.

Advanced Nitrogen Management for Corn

The District will work to improve the corn nitrogen (N) management on Sullivan County farms for the environmental and economic benefit of farmers and other stakeholders. Excessive N fertility applications as a result of underestimating the contributions from manures and crop residues are commonplace.

When the only sources of N are the soil and commercial fertilizer, N recommendations for corn have been successfully estimated based on appropriate yield expectations. However, estimating the contributions of manure and legume N is complicated because of the variability of factors such as forage stand composition and

the timing, method, and rate of manure applications. Therefore, it is difficult to make economically and environmentally sound N recommendations on many Sullivan County farms.

The District's goal is to have farmers adopt improved N management techniques. Initial success can drive wider adoption. Good N management, including efficient N use, can minimize the amount of nitrate that is excessive for crop growth and available for possible contamination of water resources.

The District has purchased a Minolta SPAD Meter. The meter is a small portable instrument, well-tested and utilized in Pennsylvania, which instantaneously provides a producer with information to accurately determine corn N requirements. N testing techniques previous to the meter being available proved cumbersome and time consuming. As a result, adoption rates by farmers were low. Perhaps the greatest impediment to the SPAD meter being adopted by individual Pennsylvania farmers is its initial cost. Utilizing one instrument and combining the N testing requirements of a group of farmers over many acres has proven more workable.

Implementation of the SPAD meter testing procedure reveals actual economic savings as we compare before and after data. It will also quantify the potential environmental benefits as well. The District anticipates a 30% reduction in total N applications over the affected acres. To ensure that sufficient N recommended by the procedure and ultimately applied by the farmers, we are proposing late-season cornstalk nitrate tests are performed on representative fields of each cooperating farm. Late season cornstalk nitrate tests can determine if N fertilization was sufficient to optimize yields.

Farmers participating with the project will work closely with the Sullivan County Conservation District and Penn State Extension personnel. This effort includes classroom meetings and on-farm field demonstrations. Documentation and scientific support for the SPAD Meter and Late Season Cornstalk Nitrate Test are available from Penn State Cooperative Extension.

Barnyard Runoff Controls

Runoff from barnyards can contribute to water being contaminated with excessive nutrients and sediment. The installation of roof gutters and diversions can keep clean water from becoming contaminated by manure and sediment around the barnyard. Best management practices such as heavy use protection areas, manure stacking facilities and manure storage facilities can be installed to keep manure contained so it cannot contaminate surface water. Treatment filters can be installed to treat water before it enters water resources. These practices, as well as similar practices, can be funded through EQIP and Nutrient Management Implementation Grants after the barnyard runoff controls have been identified as being needed in a nutrient management. The District will help interested landowners find funding sources, as well as help them go through the proper channels.

Cover Crops

The Sullivan County Conservation 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 after 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. The District's goal is to have 300 acres of cover crops established on corn silage fields. This is 14.5% of the corn silage crop in Sullivan County according to the 2012 PA Ag Statistics.

To quantify the nutrient and sediment savings created by planting cover crops you must take the land use loading rate times the total acres planted times the reduction efficiency. The reduction efficiency rates are 45% for nitrogen, 15% for phosphorous and 20% for sediment. Assuming that all 300 acres were planted at least seven days prior to the first frost using conventional tillage, a net savings of 3,726 # nitrogen, 78 # phosphorous, and 56T sediment would be achieved over.

No-till farming

The District will promote the use 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. Farmers will also benefit from having increased soil moisture retention.

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 wear from not having to plow their fields. This will lead to increased time to do other necessary farm related duties and decreased fuel costs.

The District's goal is to have 300 additional acres of corn crop planted by no-till methods. This represents 7% of the corn cropland that is planted in Sullivan County annually. The reductions in water pollution for each acre that is switched to no-till from convention tillage are as follows: 3.4 #/A nitrogen, 0.85 #/A phosphorous, and 0.646 T/A sediment. Over 300 acres, this would lead to a saving of 1,020 # nitrogen, 255 # phosphorus, and 194T sediment from entering the waters of Sullivan County.

Farmers switching to no-till can get information at the Sullivan County Agricultural Resources Center from the Sullivan County Conservation District and the Penn State Cooperative Extension Service staff. Another valuable source of information for farmers interested in switching to no-till farming practices would be farmers already doing no-till farming in the northeastern region of Pennsylvania.

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

The degradation of stream banks due to animal access is evident throughout the County. This results in sediment and nutrients entering the streams. Fencing promotes pasture management, giving the operator more control over where cattle graze. By reducing animal contact with surface water, there is less potential for pollution such as 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 the streams include

reduction of nutrients, sediments, farm chemicals, and bacteria entering the streams. This results in increased water quality.

An adequate amount of water quality is essential for efficient animal production. Therefore, animals excluded from streams will need to be provided water by other means. Those alternatives include 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 in shading streams to optimize light and temperature conditions for aquatic plants and animals. The roots of the trees and shrubs aid in stabilizing stream banks, thus reducing cut bank erosion.

These practices are funded through the Conservation Reserve Enhancement Program (CREP) at a rate of 140%. Rather than compete with this program, the District will assist the Nature Resources Conservation Service (NRCS) in promoting the CREP program

To quantify the nutrient and sediment load decrease created by establishing 25 miles of forested riparian buffers you need to figure a reduction calculation and add it to a land use efficiency calculation. To calculate the reduction, you need to take the original upland land use loading rate minus the forest loading rate and multiply that by the number of acres converted. This is added to the upland land use efficiency times total acres treated times an efficiency rate. To figure acres treated, it is assumed that every 435.6 foot buffer strip that is 100 feet wide will treat 5 upland acres for nitrogen and 2 upland acres for phosphorous and sediment. The efficiency rate used for Sullivan County is the Appalachian Plateau efficiency rate, which is 60% for nitrogen, phosphorous, and sediment. Assuming that 90% of the forested riparian buffers will be established on conventionally tilled farmland and the remaining 10% will be established on pasture, a net savings of 24,892 # nitrogen, 949 # phosphorous and 609T sediment will be achieved.

To quantify the nutrient and sediment load decrease created by establishing 20 acres of grassed buffer strips you need to figure a reduction calculation and add it to a land use efficiency calculation. To calculate the reduction, you need to take the original upland land use loading rate minus the forest loading rate and multiply that by the number of acres converted. This is added to the upland land use efficiency times total acres treated times an efficiency rate. To figure acres treated, it is assumed that every 435.6 foot buffer strip that is 100 feet wide will treat 5 upland acres for nitrogen and 2 upland acres for phosphorous and sediment. The efficiency rate used for Sullivan County is the Appalachian Plateau efficiency rate, which is 41% for nitrogen, and 60% for phosphorous and sediment. Establishing 20 acres of grass buffer strips will result in a net savings of 1,626 # nitrogen, 75 # phosphorous and 4T sediment.

To quantify the nutrient and sediment load decrease created by establishing 20 miles of stream bank fencing in conjunction with forested riparian buffers, you need to figure a percent efficiency reduction calculation and add it to a land use reduction calculation. To calculate the percent efficiency reduction, you need to take the pasture upland loading rate times the total acres treated times the percent efficiency. The percent efficiency is 60% for nitrogen and phosphorous and 75% for sediment. This is added to the land use reduction calculation, which is the pasture loading rate minus the mixed

open loading rate times the total acres excluded by this practice. To figure acres treated, it is assumed that every 208 linear or fencing will treat 2 upland acres for nitrogen, phosphorous, and sediment. By establishing 20 miles of stream bank fencing in pastureland, a net savings of 9,571 # nitrogen, 630 # phosphorous and 214T sediment will be achieved.

Educational Awareness

Public education is a vital component of everything that the Sullivan County Conservation District does. Without public education and public awareness, there would be little hope in making any gains in improving soil and water quality throughout Sullivan County. Whenever a landowner or a group contacts the District about a project that they would like to do, it is the District's responsibility to provide information and education about that project to the landowner or group. This helps to create or maintain a good relationship between the District and the landowner or group. It also helps to ensure that the project accomplishes the desired objectives and that it is done properly.

To promote the best use of natural resources, the District will work with Penn State Extension and other conservation partners to deliver information as efficiently as possible. The Sullivan County Conservation District publishes a quarterly newsletter called *The Conservationist.* The Conservation District will continue to host educational programs on various topics whenever the need arises.

The District also does regular outreach education throughout the community. Annually, the District partners with the Sullivan County School District by assisting Sullivan County High School's Envirothon team, coordinating and judging the annual Conservation Poster Contest posters submitted by students at the county elementary school, and assisting teachers in the Sullivan County School District with lessons about soil and water conservation. The District also has an annual seedling sale which promotes the benefits of forest regeneration, and conducts several public outreach education programs/workshops each year.

Dirt, Gravel, and Low Volume Road Pollution Prevention Program

The Sullivan County Conservation District oversees the Dirt, Gravel, and Low Volume Road Pollution Prevention Program in Sullivan County. This program is funded by earmarked state funds for the purpose of eliminating dust and sediment pollution created by dirt and gravel roads. The runoff from dirt and gravel roads can enter local waters and cause decreased dissolved oxygen levels in these waterways. Decreased dissolved oxygen levels make it harder for aquatic organisms to survive and can even lead to their demise by causing them to suffocate due to a lack of oxygen availability in their water. The Low Volume Roads portion of the program was established in 2013 with the passing of the state's Transportation Act 89.

Each year the Sullivan County Conservation District receives requests to accomplish environmentally sound maintenance practices and approved products to correct existing pollution problems. Annual funding for the Dirt, Gravel, and Low Road Pollution Prevention Program in Sullivan County will be approximately $427,000 with the new funding in 2014.

Erosion and Sediment Pollution Control Program

The Sullivan County Conservation District oversees the Erosion and Sediment Pollution Control Program in Sullivan County. The District's responsibilities for this program include reviewing and approving Erosion and Sediment Control Plans (E & SC Plan) and inspecting sites that require an E & SC Plan while the project is being completed. The purpose of the site inspections is to assure that the plans are being properly implemented, erosion and sediment control are being installed, and to ensure that work is being completed in the proper sequence.

Under the Pennsylvania Department of Environmental Protection's (PA DEP) guidelines, any site disturbing soil is required to have some form of erosion and sediment control. Sites disturbing less than 5,000 square feet of soil are required to takes steps to minimize accelerated erosion and sedimentation, but do not need a written E & SC Plan. Sites disturbing over 5,000 square feet are required to have a written E & SC Plan. Any site over one acre with a point source discharge into waters of the Commonwealth or any site disturbing over five acres is also required to have an E & SC Plan approved by the District as part of a National Pollutant Discharge Elimination System (NPDES) permit. Any project that is regulated under DEP guideline is also required to have an E&SC Plan.

Forest Management

The Sullivan County Conservation District is committed to preserving, maintaining and creating healthy forests through education and professional assistance. The District has a Nationally Certified Arborist who can assist private woodland owners, foresters, loggers and developers in forest planning, management, and tree care. The Conservation District also oversees the Erosion and Sediment Pollution Control Program in Sullivan County.

Through the Erosion and Sediment Pollution Control Program, the District reviews activities relating to the timber harvest of the local forests that require an Erosion and Sediment Control Permit. This includes harvesting and road maintenance activities that disturb over 25 acres and assisting with stream crossing permits. The District is also available to assist people who need an Erosion and Sediment Control Plan but do not require a permit for their forest harvesting activities.

The Conservation District assists private woodland owners by helping them determine which tree species will grow best with their soil conditions and by providing information for the best survival rate for their tree plantings. Landowners may also purchase seedlings from the Conservation District to plant on their properties. The District can also assist landowners how are interested in completing habitat improvement projects to create better habitat for specific birds and animals. The Sullivan County Conservation District also offers urban forestry classes that cover topics such as pruning, tree selection, and tree disease problems.

Acid Mine Drainage Treatment

In addition to scaring the earth and posing human safety risks, past mining activities has impacted the water quality of the upper reaches of the Loyalsock Creek. These water quality impacts are created by the discharge of acid and metal polluted waters from deep within the mines. The Conservation District has worked hard to control

the pollution impact of acid mine drainage. Through the cooperation of the State Bureau of Abandoned Mines, two large passive treatment systems are effectively alleviating acid concerns and allow metals to precipitate out of the water prior to entering the Loyalsock Creek.

The Sullivan County Conservation District has also worked to come up with low cost, low input, and effective measures to treat acid mine drainage. These measures include placing limestone rocks (#4) on permanent fords near acid mine drainage sites and having the traffic using those fords grind them to release calcium carbonate into desired treatment areas, placing limestone sand in piles next to acid mine drainage areas and having rain water move the calcium carbonate into the waters where treatment is desired, and using limestone dust to treat acid mine drainage instead of the more costly limestone sand. Water quality monitoring is done prior to attempting acid mine drainage treatment and after treatment has occurred to check the efficiency of each of the treatment methods. The Sullivan County Conservation District would like to explore opportunities to create small wetlands in an effort to treat small acid mine drainage seeps.

The conservation district is committed to providing assistance in the operational maintenance of acid mine drainage treatment facilities located in the upper Loyalsock Creek. The District also continues to work with local, state and federal agencies to increase treatment of these effected waters and further improve water quality of the Loyalsock Creek.

Mine Land Reclamation

The Sullivan County Conservation District supports and sponsors mine land reclamation projects throughout the county. Past coal mining activities have left scars on the land and has impacted the water quality of the upper reaches of the Loyalsock Creek. Surface mining has left numerous high walls of 40-50 feet that pose a threat to human safety. Through the cooperation of landowners, state and federal agencies and the Sullivan County Conservation District, this land has been restored to cause minimal impact to the environment and eliminate human risk factors. Over 200 acres of mine land have been reclaimed in Sullivan County. The Conservation District is still actively working to reclaim additional abandoned mine land and continue to treat acid mine drainage sites.

Stream Bank Stabilization and Stream Bank Restoration

Sediment from stream bank erosion is a cause 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 849.2 miles of streams in Sullivan 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 Sullivan County Conservation District will work with interested landowners to remedy existing stream bank erosion conditions. These landowners can be owners of agricultural land 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 obtaining 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 stream banks with riprap, and installing log deflectors. Other best management practices, not listed above, may be used in stream bank stabilization and restoration projects, if they are needed in addition to, or instead of, these listed practices.

Water Quality Monitoring Program

Sullivan County is fortunate to have a large number of exceptional value (EV) streams. The existing use status of EV is the highest water quality rating assigned to waters of the Commonwealth by the PA Department of Environmental Protection. The conservation district monitors 12 stream locations on a monthly basis to collect data that indicates the health of the sampled stream. Data parameters include; pH, Conductivity, Dissolved Oxygen, Ambient temperature, Water Temperature, Nitrogen, Phosphorus, and Total Dissolved Solids (TDS). Sampling locations around the county are as follows:

SITE # 1: Elk Creek at Wissingers. (Lewis Access) (N,P)
2: Hoagland Branch at the first bridge upstream from Wissinger's (N,P)
3: Loyalsock Creek at Forksville Bridge
4: Little Loyalsock at Forksville Bridge (N,P)
5: Lick Creek upstream at Bridge on Norton Road (N,P)
6: Little Loyalsock at Rock Run Road (N,P)
7: Little Loyalsock at Cherry Township Building (N,P)
8: Mehoopany Creek near county line.
9: Loyalsock Creek at Lopez
10: Birch Creek at bridge on Old Bernice Road
#11: Muncy Creek at route 220 bridge Muncy Valley
#12: Rock Run

Watershed Associations

The Sullivan County Conservation District is committed to working with local watershed associations to help improve and/or maintain the water quality of the waters of Sullivan County. Watershed associations throughout Sullivan County are working to stabilize stream banks, restore riparian buffers along our streams, control invasive plant species, restore fisheries, monitor water quality, encourage better management practices for storm water and land use, and educate their communities on the importance of natural resource protection and conservation.

Wetland Restoration and Wetland Creation

Wetlands are known as nature's filters. The US EPA estimates that over 100,000 acres of wetlands are lost throughout the United States annually. To counter the loss of wetlands, there is an initiative through several federal agencies to restore at least 100,000 acres of wetlands annually.

In an effort to combat the loss of wetlands, the Sullivan County Conservation District is supportive of efforts to restore or create wetlands. Wetland restoration is the process of taking areas that previously functioned as wetlands and modifying them back towards their previous natural state. Wetland creation is taking an area that was not historically a wetland and modifying it to function as a wetland. The Sullivan County Conservation District would also like to explore opportunities to create small wetlands in an effort to treat small acid mine drainage seeps.

Other Conservation District Agricultural Efforts

The Conservation District has taken a role in promoting safety and on-farm awareness to the dangers that exist on agricultural operations. In 2012, the district utilized Act 13 funds to post updated signage at all of the county's manure storage facilities whether active or inactive as both pose dangers to farmers and visitors to the farm operation. The district continues to support safety and danger awareness and plans to act accordingly to other issues as they arise.

The Conservation District has also obtained portable scales through the Chesapeake Bay Program's grant funding and offers manure spreader calibrations to all farms in the county that mechanically spreader manure nutrients. The calibration process allows farmers to better utilize manure applications by knowing what quantities are spread given the particular spreader, load size, and tractor speed.

The Conservation District has also begun taking soil samples from oil and gas pipeline ROWs and comparing them to samples taken off the ROWs. Results are being inserted into a GIS shape file and table. Some results are noted visually by crop performance, while other results are noted in the soils.

Summary

The Sullivan County Conservation District will work with its conservation partners to maintain and improve the water resources of Sullivan County. Areas where impaired waters are located will be targeted as areas to focus our attention to get the quality of those waters back to acceptable standards. At the same time, we will strive to maintain water quality in areas where water quality standards are being met through educational awareness activities.

In order to maintain and/or improve water quality, The Sullivan County Conservation District will fulfill its delegated obligations of the Erosion and Sediment Pollution Control Program and the Dirt, Gravel, and Low Volume Road Pollution Prevention Program. We will also work with local watershed associations to improve stream conditions in the County. Through the Chesapeake Bay Program, we will provide funding for special projects to improve water quality by reducing nutrient and sediment loads from agriculture practices.