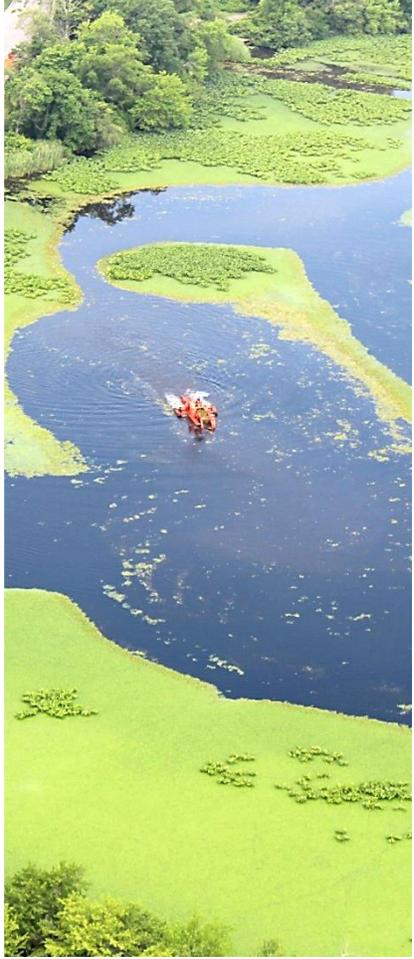


New York State Conservation Project Assistance

Soil & Water Conservation Committee
2015 Conservation Project Financial Assistance



Soil and Water
Conservation
Committee

2015 Conservation Project Financial Assistance Report

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New York State Soil and Water Conservation Committee

The NYS Soil and Water Conservation Committee (State Committee) works to advance comprehensive natural resource management through the support of County Soil and Water Conservation Districts. To advance this goal, the State Committee is authorized to provide State Aid to 58 County Soil and Water Conservation Districts. State Aid comes from the New York State Environmental Protection Fund (EPF). The amount of funding through the EPF is set annually by the governor and state legislature. The EPF is mainly financed through real estate transfer taxes. Pursuant to Soil and Water Conservation District Law (SWCDL), three provisions of the State Aid to Districts program include: state reimbursement for technical expenses, Conservation Project Financial Assistance, and competitively awarded conservation project resources based on Performance Measures.

Conservation Project Financial Assistance

The State Committee awards \$6,000 per County Soil and Water Conservation District (SWCD), with the exception of New York City SWCD which is eligible for \$30,000 because it encompasses the five boroughs, to assist with the implementation of local conservation projects that benefit private landowners and/or the general public.

Conservation Project Financial Assistance provides public dollars for locally driven natural resource protection. The flexibility of the funding has expanded partnerships that magnify the effect of public funds on the land. The goal of the funds are for carrying out projects which:

- Conserve, restore, and enhance the soil and water resources of the state
- Assist in the implementation of agricultural best management practices
- Prevent and reduce agricultural and non-Ag NPS water pollution
- Assist in the control of floods and mitigate flood damage
- Protect and restore streams and wetlands
- Protect and restore wildlife and aquatic habitat
- Assist in the drainage of agricultural lands
- Prevent impairment of dams and reservoirs
- Control stormwater run-off, including from construction sites
- Assist in maintaining the navigability of rivers and harbors
- Reduce agriculturally-generated air pollution
- Assist the agricultural production of green energy
- Protect open spaces
- Collect and dispose of pesticides
- Manage public lands
- Protect and manage rural and urban forests

2015 Conservation Projects

This report details the 57 **Conservation Project Financial Assistance** projects completed in 2015. In addition to the \$349,205 in state funds, Districts leveraged funds locally to garner an additional \$895,000 in matching funds. For a total of \$1.2 million spent on local conservation projects in 2015. Since the program's inception in 2006, Districts have been awarded \$2.8 million in Conservation Project Financial Assistance funding and have implemented 524 projects.

2015 project highlights include:

- Establishment of a Conservation Plant Material Center and Stream Restoration Plant Material for streambank stabilization projects (willow stakes stabilize & filter runoff to streams)
- Stabilize 4,200+ ft. of streambanks, reduce 5,400 tons sediment entering streams such as Bash Bish Creek, Shingle Kill, Keiffer Hollow Creek, and Buffalo Creek
- Reconnection of floodplain on Walnut Creek; removal of log jams on stream and tributaries; assessment and inventory of 128 culverts for fish passage and flooding
- Creation of 2 acre pond and wetland for stormwater management; restoration of 38 acre pond for flood mitigation and wildlife habitat
- 11 acres of Forest Buffers planted; 20,000+ trees & shrubs planted
- Forest Management Plans developed/updated for 1,300 acres of forestland
- 2,500 tires collected for recycling
- Agricultural Best Management Practice systems implemented such as a Bedded pack barn installed eliminating 15 animals from having access to a stream; Milkhouse waste storage and transfer system installed; Grazing system for hogs implemented
- 165,000 ft. tile drainage installed for improved soil health
- 1,220 acres of no-till implemented with equipment made available by Districts

Agricultural Environmental Best Management Practice Systems

Allegheny – McMahan Farm Bedded Pack Barn



The Allegheny County Soil and Water Conservation District (SWCD) worked with a local farm to convert an old dairy barn into a bedded pack barn. With a bedded pack system, large amounts of bedding are put into a housing facility to allow animals to lounge and eat in the same area. A bedded pack barn allows cows more

freedom of movement and the animals can be fed inside during the winter months for improved cow comfort. Storing manure within the same barn where cows are housed keeps the manure in solid form and is incorporated into the bedding. These barns can provide a reduction in manure storage costs and needed space. The conversion to a bedded pack barn involved removing old dairy equipment, installing a bedding area, and a feed lane. This project eliminated the feeding of 15 animals less than 35 feet from a stream during the winter months reducing the potential for pollution entering the stream. This management system also allows the farm to collect all of the manure from the animals for proper nutrient management to crop and hay fields.

Chenango - Drainage of Agricultural Lands



The Chenango County Soil and Water Conservation District (SWCD) supports farms and landowners wishing to improve their land productivity by implementing tile drainage. By removing excess water from the upper layers of the soil more quickly than undrained soils, tile drainage brings soil moisture levels down for optimal crop growth and can improve the trafficability of the soil. Heavy machinery use and tillage on wet soils can result in soil compaction, which damages soil structure. Too much subsurface water can be counterproductive to agriculture by preventing root development and inhibiting crop growth. Proper drainage on

cropland can improve soil productivity, allowing the farmer the ability to get on their fields sooner and harvest later in the year. A lengthened growing season reduces wear and tear on farm machinery and helps produce larger yields.

In 2015 the Chenango SWCD surveyed and designed tile drainage projects for twelve producers. The SWCD evaluates several on-site factors when designing subsurface drainage systems such as soil type, topography, outlet placement, and existing wetlands.



Chenango SWCD designed and installed 28,000 feet of tile drainage in 2015.

A total of 28,000 feet of drainage tile was installed. The improved surface and subsurface drainage is necessary for some soils to optimize the crop environment and reduce production risks for the farm.

Clinton - Agricultural Land Drainage Project

Clinton County farmers are challenged by a shorter growing season than most of the state and poorly drained soils is an obstacle for planting and harvesting. However, many of the soils in Clinton County are considered "prime when drained". To assist local farms to improve the workability and aeration of their cropland, subsurface drainage has been an important factor in increasing productivity and soil health. The Clinton County Soil and Water Conservation District (SWCD) worked with two interested farms in 2015 to implement tile drainage.

The District surveyed and flagged nearly 75 acres of farmland. Subsequently, 104,875 feet of subsurface drainage was installed with District assistance. This land grew corn silage in 2015 but will be converted to alfalfa production in the near future. Much of this land is now Prime Farmland and in some cases, yields may double, lowering production costs substantially. In the case of one of the farms, yields doubled from 10 -12 tons per acre to almost 25 tons per acre.

Benefits of drainage include improved soil health, less compaction and the ability to work the land earlier and harvest later. In places where choppers or trucks pulled with another tractor to harvest, the ground was consistently dry and drivable. Since the fields dried out sooner in the spring, longer season varieties were planted which has improved yields even more and will lead to long term farm sustainability.



Farmland is surveyed and subsurface drainage is installed to help with soil drainage.



Columbia - Pastured Pork Grazing System Improvements

The Columbia County Soil and Water Conservation District (SWCD) worked with a farmer to implement a rotational pen program for the off-pasture management and handling of hogs. This practice increases farm efficiency and promotes proper pasture management. Damage to the pasture occurs from hogs rooting the soil. Off-pasture pens reduce the potential for erosion and runoff from the pasture. Forage quality will also improve increasing a farmer's ability to expand forage cover by 25%.



Rotational pen for off-pasture hogs implemented with technical guidance from Columbia SWCD.

Delaware – Milkhouse Waste and Riparian Buffer Project

The Delaware County Soil and Water Conservation District (SWCD) assisted a 77 head, 180 acre dairy farm with two projects; a milk waste tank and management plan, and 1.7 acre riparian forest buffer where trees and shrubs were planted next to the stream. The farm's waste system was no longer sufficient to cope with a larger herd so a new 500 gallon tank was installed. The SWCD helped update the farm nutrient plan to help spread the extra milk waste along with manure on crops with



Tree and shrub establishment for Riparian Forest Buffer at farm in Delaware County.



New concrete septic tank and transfer system for loading milkhouse waste.

the right timing, placement, and rate. The owners of the farm also created a riparian buffer to exclude their livestock from a headwater recharge area and pond that eventually flows into the Susquehanna River and Chesapeake Bay. Excluding access to the waterbody by livestock will improve on-farm and downstream water quality. The buffer consisting of a variety of trees and shrubs tolerant to flooding will filter surface runoff and shallow groundwater before reaching the waterbody. In addition to improving water quality the buffer will improve habitat for fish, wildlife, and livestock.

Franklin - Water Quality Monitoring to Determine Effectiveness of Ag BMPs



Franklin SWCD staff use a water quality probe for testing local waterbodies.

The primary cause of New York's water quality issues can be attributed to a wide array of pollutants resulting from various types of land uses, which is termed Non-Point Source (NPS) pollution. As rainfalls or snowmelts, runoff picks up and carries away natural and human-made pollutants, depositing them into lakes, rivers, wetlands, coastal waters, and underground sources of drinking water.

The Franklin County Soil and Water Conservation District has been working under the NYS Soil and Water Conservation Committee's Agricultural Environmental Management (AEM) Framework to provide technical assistance to farmers for environmental resource concerns. To determine the effectiveness of the agricultural best management practice

(BMP) systems implemented in the county the District has started a water quality monitoring program.

Many Franklin County waterbodies are unassessed so baseline data must be determined first. Therefore it was proposed to collect one sample at the start of watersheds across Franklin County. In 2015, the District purchased a water quality probe and worked with a local certified water quality lab to collect water samples within 20 of the sub-watersheds in the County. The District also included another 5 samples collected at areas with higher concentrations of agriculture and impervious surfaces. Samples were tested for dissolved oxygen, pH, salinity, conductivity, temperature, nitrate, total phosphorous, ammonia, nitrogen, turbidity, calcium/magnesium, and total coliform.

The results from the sampling indicated: the general health of the water in Franklin County is good. There were some elevated results for nitrates, pH, salinity, hardness, conductivity, and total dissolved solids. In 2016, the District will collect at least another sample within each major watershed in the county. The information will be used to plan and develop the District's AEM strategy and help prioritize farms to work with. The District will continue this project for several years to monitor the water quality in the county.

Herkimer – Agricultural BMP Implementation Project

The Herkimer County Soil and Water Conservation District (SWCD) provided technical assistance to a local farm for the implementation of an agricultural best management practice (BMP) system to protect water quality. A roof water control system and access



Manure loading area before (left). After (right) roof gutters divert clean rainwater away from the manure loading area and a new access road allows for manure to be managed properly.

road were installed on a farm in the Town of Norway, Herkimer County. This project eliminates clean water from entering the manure loading area at the north end of the barn. Contaminated water no longer runs off of the property and/or along the original unimproved access road ultimately to the road ditch. Clean rainwater is now directed to a protected outlet through roof gutters installed on the barn. The new access road leading to the manure loading area allows for the manure to be completely contained onsite. By containing the manure and excluding clean water from entering the manure loading area the combined components protect water quality and often improve the use of on-farm nutrients, thereby reducing energy for fertilizer production and transport.

Livingston – Water and Sediment Control Basin Structures



Livingston SWCD aided in the installation of catch basins to address erosion, water quality, and safety hazard issues.



The Livingston County Soil and Water Conservation District (SWCD) aided a local farmer to halt gully erosion on their cropland. The District provided technical assistance for the installation of a 450 foot underground outlet and a series of water and sediment control structures (WASCOBs). The WASCOB is designed to capture excess water and sediment to address existing gully formations along Macintyre Road. Location of the gullies at the road crossing was also identified as a continual safety hazard as there was a depth of 9 feet from the shoulder of the road to the gully and culvert underpass. The control structure also acts as a sediment trap and helps reduce sediment bound for local waterbodies therefore improving water quality.

Orange - Agricultural Equipment Rental Program



Conservation tillage offers a low-cost effective means of controlling erosion, promoting soil health, and meeting mandatory and voluntary conservation objectives. However, specialized, expensive equipment is usually required to implement this practice and many farmers do not own such equipment. The Orange County Soil and Water Conservation District (SWCD) recognizes these obstacles and has developed an Agricultural Equipment Rental Program to give all farmers in the County access to no-till planting equipment. The District operates two no-till corn planters and two no-till grain drills. In 2015, 46 individual farms utilized

the no-till equipment. The equipment was used 63 times (multiple uses at the same farm). A total of 440 acres were planted with the corn planter and 780 acres were planted with the seeder.

Saratoga - Agricultural Drainage Technical Assistance Program

The Saratoga County Soil and Water Conservation District (SWCD) provided technical assistance to farmers with feasibility, planning, survey, design, layout, and construction of surface and subsurface drainage on crop fields, pastures, and paddocks. Some projects involved feasibility or planning, others included survey and design work, while some included all phases of drainage throughout the installation. The subsurface drainage enabled farms to improve crop productivity, protect their agricultural land from compaction, and allow timely access to plant, harvest crops, or graze animals.



The project provided technical assistance to farmers to make crop fields and pastures more productive and allow access for planting and harvesting. Five drainage plans were created for 14,500 feet of drainage. Eleven landowners had site feasibility assessments for installation at a later date. Several drainage systems used GPS location for better management. The District is working with these farmers on an ongoing basis and feedback has been positive regarding soil drainage.

Invasive Species Management

Fulton - Ephratah Pond and Wetland Enhancement Project



Constructed pond (above) will provide habitat, recreation, and learning opportunities for the community. A dry hydrant installed (below) will provide rural fire protection.

The Fulton County Soil and Water Conservation District (SWCD) partnered with a local business to make enhancements to a wetland area adjacent to the property. The proposed 1/4 acre site sat within a state wetland therefore the SWCD conducted a site visit with the NYS Department of Environmental Conservation (DEC) to choose the best area within the wetland for the construction of a pond. The chosen site was inundated with Phragmites reed grass, an invasive species. A DEC permit was obtained and the Phragmites were removed and stockpiled at the county landfill to contain any spreading of the



plant. The construction of the pond and removal of the Phragmites will improve habitat and provide recreational opportunities at the site. The 1/4 acre pond was constructed at the Ephratah Rod & Gun Club which will also be utilized by the Fulton-Montgomery Community College (FMCC) Natural Resources class to further their studies. The Rod & Gun Club are planning to hold annual youth fishing events at the pond. Fulton County SWCD also provided a dry hydrant that was installed for rural fire protection.

Nassau – Town of North Hempstead Native Plant Restoration



Nassau SWCD removed invasive Phragmites and replanted native grasses frequently found in coastal salt marshes. The restoration project will create habitat for native marine life.



The Nassau County Soil and Water Conservation District (SWCD) partnered with the Town of North Hempstead to control a stand of invasive Phragmites reed grass at Mill Pond, Port Washington. Phragmites out-competes native plant species and creates a monoculture, which is detrimental to the ecosystem. The town was responsible for portions of the overall project such as obtaining a permit to apply pesticides. The Nassau County SWCD took the lead on the native plant restoration portion of the project. The native plant restoration involved planting over 4,000 Spartina plugs (a genus of plant in the grass family), erecting a silt fence, and installing goose fencing. The District continues to monitor the site for

progress and minor maintenance. The outcome of the project was a fully native vegetated area within Mill Pond. These efforts have restored habitat for native animals and insects which could not utilize the Phragmites as habitat.

Niagara - Bonds Lake Park Habitat Improvement Project

Bonds Lake Park is a county-owned park containing several lakes, including Bond Lake, Meyers Lake, East Meyers Lake, and Thaler Lake. Through deposition and accumulation of organic matter the depth of the lakes have been diminished, resulting in an abundance of Eurasian Milfoil an aquatic invasive plant. Due to the dense overgrowth, recreational use of the lakes is virtually eliminated and an overpopulation of forage fish has occurred. To address the control of this aquatic invasive species, grass carp were introduced into several lakes from 2010 - 2012. A fish kill occurred in Bonds Lake during the winter of 2015 which caused a loss of grass carp and bass in the lake. The Niagara Soil and Water Conservation District (SWCD) added additional grass carp to Meyers, East Meyers, and Thaler Lake and replaced the grass carp and bass that were lost in Bonds Lake. The project stocked 300 grass carp and 150 bass. In the future, an assessment of the aquatic vegetation will be made and an adjustment of the grass carp population will follow. Control of Eurasian Milfoil will improve aquatic habitat in the lakes and maintain a sustainable fish population.

Seneca - Preventing the Spread of Emerald Ash Borer



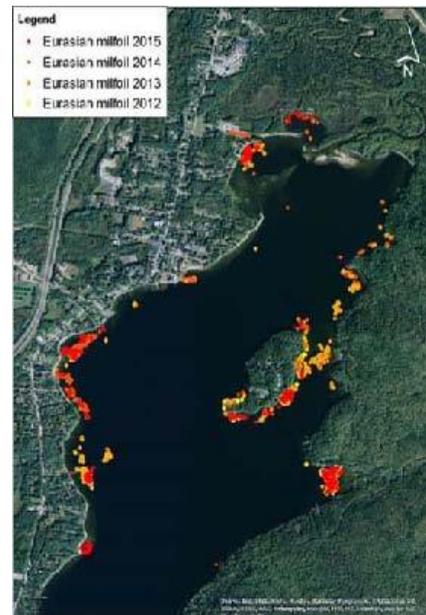
The Seneca County Soil and Water Conservation District (SWCD) purchased a new wood chipper to partner with local municipalities to prevent the spread of Emerald Ash Borer, an invasive beetle that threatens ash trees. The County and Town Highway Departments have been using the wood chipper throughout Seneca County to chip trees and brush on-site. Chipping on-site stops the potential for transporting invasive species such as the Emerald Ash Borer and the Asian Long Horned Beetle to new areas. This preventative practice reduces the overall cost of managing invasive species and helps to protect and promote the spread of native beneficial species.

Warren - Aquatic Invasive Species Management



Curly-leaf pond weed found in Brant Lake in Warren County.

The Warren County Soil and Water Conservation District (SWCD) assisted the Towns of Horicon and Chester with aquatic invasive plant management on Schroon and Brant Lakes. The SWCD provided assistance to the communities by obtaining and maintaining the harvest permits of Eurasian Watermilfoil and Curly-leaf pondweed through the NYS Department of Environmental Conservation (DEC). The District also procured the services for hand harvesting the invasive plant species and the reporting of contracted work to the permitting agencies and town officials. Following each harvesting period, District staff visited the





Warren SWCD staff check milfoil populations in the lake.

harvested sites using snorkeling gear to inspect areas worked during the week to evaluate conditions of the harvested locations and to assess effectiveness of the work being done. Initially the harvested material was checked to ensure that only invasive plant species were being removed and to confirm that no damage was being done to rare or endangered native plant populations in the lake. The

volume of aquatic invasive plant material that was removed from Schroon Lake in 2015 was 750 pounds from 11 lake zones. In Brant Lake, the volume of material harvested was 6,100 pounds from 11 lake zones. Plant densities have declined due to the managed harvesting and volunteer efforts by residents to scout for invasive plants.

Recycling and Waste Management

Cayuga - Wood Waste Recycling Project



The Cayuga County Soil and Water Conservation District (SWCD) partnered with the county to reduce the amount of woody biomass going to the local landfill. Partially as a result of the emergence of the emerald ash borer (EAB) in the area, the City of Auburn began compiling wood waste at the City's landfill location. The SWCD utilized its tubgrinder to process approximately 750 cubic yards of wood waste in 2015. By processing the woody debris into 2" diameter material, the potential threat of the EAB to spread is significantly reduced. The final

product is provided to residents and used for municipal landscaping.

Tompkins - Countywide Tire Recycling Event

Tire collection events were hosted by the Tompkins County Soil and Water Conservation District (SWCD) in the Town of Caroline and the Town of Groton. Tires were collected at a centralized location and sent to a recycling facility where they will be ground into useful and environmentally sustainable materials. Over 2,500 tires were collected at these events diverting this waste out of local streams, ditches, and rivers where they have historically been dumped.



Riparian Buffers and Streambank Restoration

Broome - Dudley Creek Stream Reconstruction Technical Assistance and Design Project



The Broome County Soil and Water Conservation District (SWCD) has been instrumental in assisting municipalities and landowners to implement stream restoration throughout the county as a result of recent flooding. In cooperation with the Upper Susquehanna Coalition (USC), the Broome SWCD assisted the Town of Lisle by providing the planning, design, and project coordination to protect 400 feet of streambank that had eroded into the community ball field (pictured left).

The New York Department of Environmental Conservation (DEC) requested several changes to the design and scope of the project that had to be incorporated into the design. As a result, the implementation was split into two phases of work, the first phase is the planning,



Dudley Creek stream reconfiguration project conducted by Broome SWCD.

design, and cursory stream reconfiguration. While the second phase will reshape and anchor the new bank alignment. The first phase of implementation, which utilized the Conservation Project Financial Assistance funding, was completed in the fall 2015. Phase two will be completed when the Town of Lisle allocates funding for final construction, this is expected in summer of 2016.

Chautauqua - Silver Creek Streambank Protection Project

The Chautauqua County Soil and Water Conservation District (SWCD) provided technical assistance for streambank protection upon the removal of concrete that was illegally dumped into Walnut Creek. In order to eliminate erosion by reducing the concentration of currents on the outer bank the installation of

a series of rock riprap and bendway weirs were installed along Walnut Creek. This also enhanced the aquatic life by increasing available habitat in the creek for trout and salmon in the spring and fall. This project also follows the mission of the Lake Erie Management Commission by reducing sedimentation into the lake. The project has benefited water quality by reducing erosion within the creek and adding stability to the streambank. This project will also reduce the need for future dredging.

Chemung - Compacted Earth Diversion Berm Project



Chemung SWCD helped replace a gravel berm washed-out by storms to reduce flooding and protect residential properties (before left, after right).

The Chemung County Soil and Water Conservation District (SWCD) helped replace a gravel berm washed-out by storms. The Compacted Earth Diversion Berm project provides a greatly improved degree of protection to residential properties in the hamlet of Pine Valley. These properties were impacted in August 2013 when an un-compacted gravel berm along Panther Lick

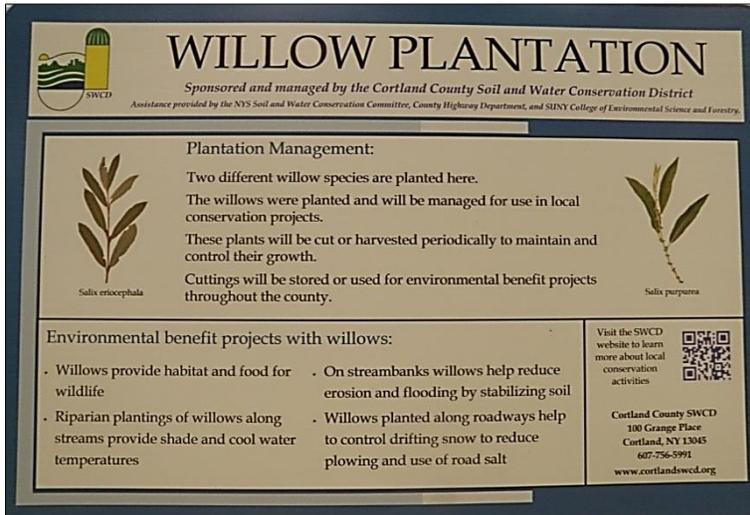
failed suddenly and catastrophically during a storm. The Compacted Earth Diversion Berm effectively replaces the un-compacted gravel berm providing vastly improved reliability and structural integrity.

Columbia - Stream Channel Mitigation Design Work

The Columbia County Soil and Water Conservation District (SWCD) worked to address flooding occurring in Bash Bish Creek, a biologically diverse watershed that provides many vital benefits to the community. The Bash Bish is ecologically important as it comprises a migratory route for American eel, a fish species that begins life in the Atlantic Ocean and migrates through stream tributaries as tiny glass eels. The stream is a cold-water habitat suitable to native fish species like brook trout that require well-shaded, cold water and are sensitive to warmer temperatures. To balance the safety of the built infrastructure with the protection of these valuable aquatic resources, the District surveyed two heavily flood-altered sections of the Bash Bish Creek for design work to mitigate flooding in the creek. A professional engineer was hired to develop a plan to mitigate flooding at the two sites. Designs include armament of the two sections of

stream to mitigate for future flood stress. The District also secured the permit necessary for the designed stream work to commence.

Cortland – Establishing Source of Stream Restoration Materials



WILLOW PLANTATION
 Sponsored and managed by the Cortland County Soil and Water Conservation District
 Assistance provided by the NYS Soil and Water Conservation Committee, County Highway Department, and SUNY College of Environmental Science and Forestry.

Plantation Management:
 Two different willow species are planted here.
 The willows were planted and will be managed for use in local conservation projects.
 These plants will be cut or harvested periodically to maintain and control their growth.
 Cuttings will be stored or used for environmental benefit projects throughout the county.

Salix eriocephala *Salix purpurea*

Environmental benefit projects with willows:

- Willows provide habitat and food for wildlife
- Riparian plantings of willows along streams provide shade and cool water temperatures
- On streambanks willows help reduce erosion and flooding by stabilizing soil
- Willows planted along roadways help to control drifting snow to reduce plowing and use of road salt

Visit the SWCD website to learn more about local conservation activities

Cortland County SWCD
 100 Grange Place
 Cortland, NY 13045
 607-756-5991
 www.cortlandswcd.org

The Cortland County Soil and Water Conservation District (SWCD) uses willows for various projects including stream bank stabilization and re-vegetation, riparian buffer re-vegetation, and living snow fences. Willow species generally used in SWCD projects are hardy naturalized species. These willows species are very resilient and can tolerate stress from high winds or high water flows. The roots of willows planted in a stream bank help to stabilize the bank and allow for other vegetation to grow, reducing erosion

and helping to improve the water quality of streams. Currently the SWCD relies on other sources to acquire willows for various projects. Sometimes there are willows already on the site and stems can be cut and planted, but there are not always enough.

To address this problem, one hundred willow cuttings were planted as a willow biomass supply for future conservation projects. To complete this project Cortland SWCD enlisted the assistance of the Cortland County Highway Department and SUNY College of Environmental Science and Forestry (ESF) who provided assistance in developing a plan for the project. The project was approved by the Cortland County Legislature and initial site prep was completed in fall 2014 and the willows planted in May 2015. Two rows were planted in a newly established plantation at Dwyer Park. They'll be managed by SWCD and cuttings will be harvested annually for streambank stabilization as well as for living snow fences and buffers.



Willows planted for restoration work by Cortland SWCD.

Erie and Wyoming - Buffalo Creek Streambank Stabilization Projects

As part of the Erie-Wyoming County Buffalo Creek Stream Maintenance program, the Erie County Soil and Water Conservation District (SWCD) and Wyoming County SWCD completed major streambank stabilization projects. These projects in both Erie and Wyoming Counties were funded through Conservation Project Financial Assistance as well as federal sources including a grant through the Great Lakes Commission.



Erie SWCD will prevent 1,400 tons of sediment from entering Buffalo Creek. Before construction to stabilize streambank on Buffalo Creek (Left). One year post construction facing upstream (right).

Erie County SWCD worked on a stretch of the Buffalo Creek in the Town of Elma. The project stabilized 550 linear feet of eroded streambank installing six rock stream barbs in conjunction with bioengineering methods. Stream barbs are rock structures that extend into the stream flow to modify flow patterns and streambed structure. Barbs are used for streambank stabilization, erosion mitigation, and fisheries habitat improvement. The barbs relieve direct streambank pressure and plantings of live stakes and willow whips



Severe streambank erosion on the Beaver Meadow Creek (above). Wyoming SWCD stabilized 225 feet of streambank, construction in progress (below).



provides for energy dissipation and sediment deposition. Live stakes are stem cuttings taken from trees during their dormant season and inserted directly into the streambanks to establish a root network and prevent further soil loss. The project is estimated to reduce streambank erosion and sedimentation by 1,400 tons while also improving water quality and mitigate localized flooding problems.

A severely eroded section of the Beaver Meadow Creek, a sub-tributary of the Buffalo Creek, was experiencing consistent flooding and was severely damaged leaving bank soils exposed with heavy sedimentation occurring. Wyoming County SWCD worked in the Town of Java where numerous mature trees had fallen into the channel creating an obstruction to streamflow. This project involved the installation of 225 feet of rock riprap, streambank stabilization with live willow stakes, construction of one rock barb, 210 feet of lined waterway, 120 feet of sub-surface drainage tile, and 0.5 acres of critical area seeding to reduce erosion on this stream channel and to reduce sedimentation to the Buffalo Creek and ultimately the Great Lakes. This project site will be monitored for effectiveness as part of the Wyoming

County SWCD annual inspection of previously installed streambank stabilization projects in the Buffalo Creek Watershed.

Essex – Post Hurricane Irene Riparian Plantings

The Essex County Soil and Water Conservation District (SWCD) utilized State Aid Funding for the planting of trees, shrubs, and willow cuttings along rivers and streambanks that were impacted by Hurricane Irene in 2011. Project partners included the USDA Natural Resource Conservation Service (NRCS) who administers the Emergency Watershed Protection (EWP) program that provides funds for projects relating to the recovery from natural disasters. Plant materials were provided by various partners including the Trees-for-Tribs program through NYS Department of Environmental Conservation (DEC). Riparian tree and shrub species and willow cuttings were planted on over 8 acres of stream corridors. The plantings will prevent erosion, increase flood water retention, improve wildlife habitat, and protect water quality. Over 20,000 trees, shrubs, and willow cuttings were planted during the 2014 and 2015 growing seasons. Thirteen sites in total had riparian plantings. Some site locations include: 1) Bulwagga Bay Project along



Tree & shrub planting after culvert replacement in Ausable River watershed.



Bulwagga Bay tree and shrub planting on Lake Champlain by Essex SWCD.

Lake Champlain where willows, trees, and shrubs were planted and monitored for growth; 2) trees and shrubs were planted on a farm that has excluded cattle from a stream area in the Boquet River watershed; 3) trees and shrubs planted along the East Branch of the Ausable River; 4) trees, shrubs, and willows planted along the Boquet River at a Fish and Game Club in Elizabethtown; 5) tree and shrub planting along Styles Brook in the Ausable River watershed after a culvert replacement.

Genesee – DeWitt Recreation Area Erosion Control and Wildlife Planting



The Genesee County Soil and Water Conservation District (SWCD) conducted an erosion control and riparian planting project on public lands at the Genesee County DeWitt Recreation Area. The project consisted of grading and shaping steep slopes in two different locations on the 38 acre pond at DeWitt Recreation Area, and stabilization of the area by planting trees, grasses, and wildflowers. The pond area is a former gravel pit that is in the process of being reclaimed with a goal of promoting a more natural condition around the pond. It is estimated that approximately 500 linear feet of shoreline will be maintained through the erosion control plantings. The area will also have access for recreation and improved aquatic habitat.



Genesee SWCD staff hydroseeding a mix of grasses and wildflowers at the DeWitt Recreation Area to prevent erosion.

Greene - Shingle Kill Stream Restoration

The Greene County Soil and Water Conservation District restored a section of the Shingle Kill Stream in Greene County to prevent erosion, increase flood water retention, improve wildlife and stream habitat, and protect water quality. The District worked with the Town of Cairo and the Greene County Highway Department on the stream restoration project along 3,000 feet of the Shingle Kill Stream. A jungle of invasive species, including multi-flora rose, fly honeysuckle, Japanese knotweed, and common buckthorn were removed from a three acre area along the Shingle Kill adjacent to the Angelo Canna town park. Much of the area was regraded and replanted with native trees and shrubs to create, as well as enhance, the existing riparian buffer along this reach of the Shingle Kill. The buffer will reduce sediment from entering the stream, filter runoff entering the stream protecting water quality, and shade the stream for aquatic habitat improvements. The amount of sediment entering the stream due to the deteriorating streambank will decrease as the native trees and plants become established and stabilize the banks. In addition to the riparian buffer, public access was improved to this noted trout stream to increase public recreation opportunities and water quality was improved.

Jefferson - Sandy Creek Streambank Restoration

The Jefferson County Soil and Water Conservation District (SWCD) conducted an ambitious streambank stabilization project to prevent soil and sediment erosion and improve fish habitat in two waterbodies in the county. In addition to State Aid funding the District received an USEPA Great Lakes Restoration Initiative (GLRI) grant for \$300,000 to complete the project at the Gillespie site located in the village of Rodman, Jefferson County on the Sandy Creek. The project will target the area where the Gulf Stream meets Sandy Creek, it has been actively eroding for several years.



Jefferson SWCD conduct steam stabilization project to prevent soil and sediment erosion.

The project will demonstrate a new technique using trees that have been blown over in the county forest that can no longer be used for timber. The local logs, with roots still attached are ideal material for bank stabilization and were placed along the



Trees from the County forest were embedded in the streambank providing ideal habitat for fish and to keep the force of the water off the bank.



entire outside bend. The trunks of the trees will be embedded in the stream and creek banks while the roots will extend into the water, providing ideal habitat for fish, and keep the force of the water off the bank. Finally, hardwood trees were planted on top of the bank to complete the 35' wide riparian forested buffer. The trees and shrubs that grow next to the stream are critical for stream health.

Incorporating woody material into this stabilization site will reduce future erosion, and creates aquatic habitat. The grade control reduced the normal flow velocities, and allowed the willow to establish. The bank full bench provides a small floodplain, where there hadn't been one before, lessening the seasonal flood damage. The willow plantings will provide bank protection for years to come. The hardwood trees will shade the banks, thereby reducing water temperatures and offering a travel corridor for wildlife.



Once complete 560 feet of stream bank was stabilized and 0.45 acres of riparian forested buffer was established. This equates to an annual reduction of 1,809 tons of silt and sediment entering the watershed from this site.

Madison - Countywide Stream Maintenance Program

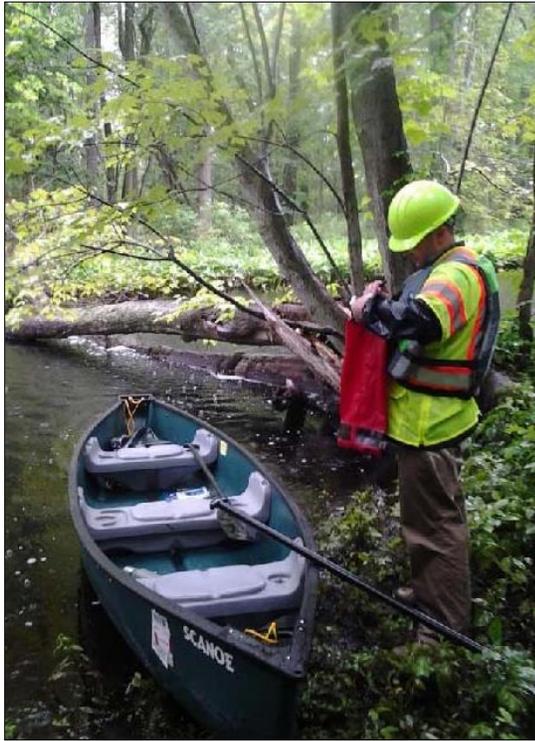
The Madison County Soil and Water Conservation District (SWCD) conducts a countywide Stream Maintenance Program to provide technical assistance regarding erosion issues. The District performs stream maintenance projects working with private landowners, local municipalities, and the NYS Department of Environmental Conservation. These projects help protect infrastructure, people's property, and water quality. Soil erosion causes damage to structures, contributes to poor water quality, degrades aquatic habitat, and can result in increased flooding. Accumulated woody debris from three log jams were removed by the District because they were contributing to flooding problems during storm events in the Village of DeRuyter, Town of Hamilton, and the Town of Lebanon. Additionally, the District completed a streambank restoration project (pictured) in the Town of Stockbridge. Riprap or rock armour was placed against the bank to protect it from further erosion and soil loss. The project will protect a residence and mitigate damage from flooding that occurred in July of 2013. Madison SWCD takes a comprehensive approach to erosion control and helps to implement diverse projects on a range of landscapes.



Madison SWCD conducts a streambank restoration project in the Town of Stockbridge to protect a residence and mitigate flooding.



Onondaga – Logjam Removal Planning Project on Limestone and Butternut Creeks



Onondaga SWCD staff assess blockages in the Mud Creek and county streams to prevent future flooding.



The Onondaga County Soil and Water Conservation District (SWCD) studied 6.6 miles of streams in four Towns and one Village. The District performed a GPS inventory of log and debris jams on major water courses in the County. Efforts were focused where previous flooding and drainage issues have been reported. Reports of findings, with GPS mapped locations of debris jams were presented to the Town Supervisor's and the Village Mayor. The municipal leaders are seeking funding to help remove these debris jams. The District has made contact with the NYS DEC, Izaak Walton League, and other environmental professionals and received approvals to

remove these debris jams. The Village of Minoa Mayor has contacted the local railroad about the dumping of railroad ties and other railroad debris into Limestone Creek. The Mayor is pushing for cleanup and removal of this debris by the local railroad. The NYS DEC and Senator Schumer have also been involved. One unexpected result from the project was that each of these municipalities have an incredible water-based recreation resource to promote once they get the debris jams mitigated.

Ontario - Handicap Accessible Fishing Platform

The Ontario County Soil and Water Conservation District (SWCD) installed an 18 x 12 foot handicap accessible fishing platform along the scenic Canandaigua Lake Outlet canal at Steamboat Landing Park. The City of Canandaigua's engineer worked with the District to locate and design the platform and the City DPW team installed it. In addition, the City of Canandaigua in cooperation with the SWCD installed over 100 feet of large stone rip-rap to stabilize the deteriorating bank





Handicapped accessible fishing platform implemented by Ontario SWCD on Canandaigua Lake Outlet protects public safety, reduces erosion by stabilizing the streambank, and improves recreational opportunities for residents.

adjacent to the platform. The rip-rap and seeding will prevent the bank from further failure and has saved several tons of sediment from reaching the Canandaigua Lake Outlet. In addition, the platform was constructed to be compliant with the American Disabilities Act (ADA) to allow for handicapped access for fishing. A porous pavement sidewalk was installed leading to the existing City

parking area and allows precipitation to soak into the ground instead of runoff potentially carrying pollution such as motor oil to the lake. The porous pavement sidewalk and platform will keep users away from the streambank and reduce erosion by foot traffic. The adjacent disturbed areas were seeded with grass and mulched for continued erosion protection. The new platform is being utilized by residents, has been showcased in District presentations to highlight stream side planning options for bank stabilization, and has even been used for wedding photographs due to its scenic location on the outlet.

Orleans - Debris Removal from County Waterways



Yanty Creek before (left) and after (right) debris was removed by Orleans SWCD to prevent flooding.

The Orleans County Soil and Water Conservation District (SWCD) continues to strengthen its partnership with the ten towns in the County Wide Drainage Program by sharing equipment. The District shares a "Slashbuster" attachment with the County, which when installed on the County excavator helps in clearing debris and blockages from streams and waterways. The District provides financial assistance to the County to cover costs for the operation of the "Slashbuster". This partnership was a success and resulted in the reduction of flooding in 5,250 feet of waterways in the County that were notorious for frequent flooding.

Otsego - Stream Debris and Hydroseeding Program

The Stream Debris and Hydroseeding Program by the Otsego County Soil and Water Conservation District (SWCD) was created to remove woody debris from active stream channels where such blockages are causing excessive erosion, threatening public/private infrastructure, and degrading water quality. Application of hydro-seed was used to establish vegetative cover on exposed topsoil such as streambanks, road ditches, and public lands (pictured).



Rensselaer – Hoosic River Riparian Forest Buffer Enhancements

Riparian forest buffers, or trees and shrubs that grow next to streams, are critical for stream health. Riparian buffers prevent pollution from entering waterways, stabilize streambanks, provide food and habitat to wildlife, and keep streams cool for ideal fish habitat. The Rensselaer County Soil and Water Conservation District (SWCD) worked on a stretch of the Hoosic River stabilizing the sites with seed and hay mulch, then planting three rows of trees and shrubs for a distance of 2,290 feet. Compost was placed around each tree and the trees were watered in order to supply enough moisture to keep the roots moist during a dry period. SWCD staff monitored the site after planting to assess the condition of the seedlings.

Schuyler - Spring Brook Stabilization, Habitat Creation, and Riparian Buffer Project



Schuyler SWCD uses willow cuttings for streambank stabilization along the Spring Brook in the Town of Hector which aided in the reduction of 200 tons of sediment from entering the stream.

The Schuyler County Soil and Water Conservation District (SWCD) stabilized streambanks and created habitat on 1,940 feet of the Spring Brook in the Town of Hector. This aided in the protection of over 3,880 feet of riparian forest buffer protecting water quality by preventing sediment from entering the waterway and providing shade to the water for ideal fish habitat. Fish stocking and macro-invertebrates were

surveyed before and after the project. There was a 50% increase in trout and a 35% increase in macro-invertebrates after the project was completed. This project also resulted in over 200 tons of sediment being reduced. This project utilized a combination of rock riprap and willow cuttings to help stabilize the stream and create habitat.

Schenectady - Critical Area Seeding Program

The Schenectady County Soil and Water Conservation District (SWCD) conducts a hydroseeding program throughout the county. In addition to seeding exposed ditches the SWCD seeded a large bank behind the Social Services building, in the City of Schenectady, where the bank was slipping and in danger of causing pollution and infrastructure damage. The importance of stabilizing the bank was a priority due to Schenectady being a regulated Municipal Separate Storm Sewer System (MS4). The large bank, approximately a half acre, was stripped of vegetation by a wildfire during a particularly dry stretch of weather. The outcome is a well vegetated and stabilized bank where erosion and sliding soils have been eliminated. Schenectady County and other municipalities are encouraged to seed and mulch all exposed ditches and banks.



Hydroseeding on roadside banks by Schenectady SWCD to prevent erosion.

Steuben - Keiffer Hollow Creek Stabilization



Streambank erosion after a storm event in Steuben County.

Due to two storms in August 2015, streambank erosion occurred along a private residence property threatening a driveway. A site visit was conducted by the Steuben County Soil and Water Conservation District (SWCD) and found the stream had undercut an embankment along the driveway for approximately 100 feet. Two large trees fell out of the bank due to the erosion. This impacted the stability of the driveway and streambanks. The landowner had concern that if left unprotected the driveway would be lost and the stream bank erosion will reoccur.



The project consisted of removing two fallen trees and the placement of 200 tons of vertical stacked rock riprap (pictured left) for 100' in length using the SWCD's track mounted excavator. The District staff hand seeded the area after installation. The project stabilized the landowner's driveway and streambank from further erosion and prevented further sediment from entering Keiffer Hollow Creek and the Great Lakes Basin.

Sullivan - Adam's Stream Relocation and Vegetated Buffer Installation



The Sullivan County Soil and Water Conservation District (SWCD) mitigated flooding by restoring the original hydrology of Adam's Stream using bioengineered bank stabilization techniques. The District reshaped the current bank along an existing corn field to relocate the stream to its original course. Trees with their root balls intact were placed along the streambank to provide stabilization and aquatic and terrestrial habitat diversity (shown left). The logs are placed at 90-degree angle from the bank and point slightly upstream. A vegetative buffer was reestablished between the corn field and the stream to filter runoff entering the stream protecting water quality and to shade the stream for aquatic habitat improvements.



Tioga - Dean Creek Watershed Protection and Structural Assessment Project

The Tioga County Soil and Water Conservation District (SWCD) is responsible for two flood control structures in the Dean Creek Watershed, Town of Spencer, Tioga County, NY. The structures were installed in the 1950's as a pilot flood control project between USDA Natural Resources Conservation Service (NRCS), Tioga County SWCD, and two private landowners. Under this project the District was designated with Operation and Maintenance for these two structures. Due to changes in NYSDEC Dam Safety Regulations (6NYRCC Part 360), High Hazard Dams such as the two the District maintains are required to have an Engineering Assessment completed as part of the Operation and Maintenance Plan. One crucial

component of the Engineering Assessment is a sediment survey by a professional engineer, this was conducted by an engineering firm in November 2015. Conservation Project Financial Assistance funding was leveraged to cover the cost of the Engineering Assessment which will allow the District to continue to Operate and Maintain these structures according to NYS DAM Safety Regulations.

Ulster – Village of New Paltz Community Park Riparian Buffer

A partnership to manage village parkland and to create a riparian buffer zone has been established between the Village of New Paltz and the Ulster County Soil and Water Conservation District (SWCD). Riparian buffers, or trees and shrubs that grow next to a stream, help to protect parklands, the community garden area, and some key village infrastructure from the impacts of erosion by the Wallkill River. This area was badly damaged by high water in recent seasons, with several trees and shrubs lost. This reduced overall buffer density has allowed the establishment of invasive vegetation. To combat further degradation, it became imperative to remove the invasive species and to reestablish competitive buffer species, restoring stand density. A total of 35 seedlings and shrubs (red osier dogwood, black chokeberry, spicebush, winterberry, and oak) were planted to restock the areas after the invasive vegetation was removed. To facilitate the establishment of the new and existing buffer, the site was monitored and maintained throughout 2015. The Village of New Paltz Public Works assisted with the maintenance aspect with some local gardeners also participating by removing debris and introducing seedlings and shrubs (currants and mulberries) grown which also augmented overall buffer density.

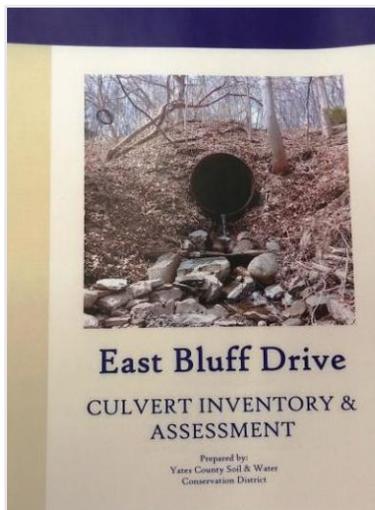
Wayne – Stream Remediation for Ganargua Creek Watershed



A failed streambank on Lower Ganargua Creek, caused by log jams over the last few years has caused significant bank undercutting, loss of soil, habitat impairment, floodplain loss, and crop damage. This

project site - a direct tributary of the Canal Corridor and the Seneca River watershed which flows into Lake Ontario - was utilized as a stream remediation demonstration, in the hope that the overall habitat for the stream ecology and farming production will improve. The Wayne County Soil and Water Conservation District (SWCD) estimates soil loss is on average 25 tons per 100 feet of streambank per year per site. The District anticipates this project will inspire other landowners to work with the District on future sites under the newly funded *Stream Program for Lower Ganargua Creek* through a NYS DEC Water Quality Improvement Program (WQIP) grant. Lower Ganargua Creek has a deeply cut channel that is disconnected from its floodplain. Its high streambanks no longer have sufficient support and are subject to erosion. Under high flow conditions, the water is not able to spread across its floodplain where it would slow down and dissipate energy. Without remediation the stream's energy continually cuts into the streambank until it has established a new, lower elevation. In turn, causing excessive sediment deposits evident by the concentrations of total suspended solids (TSS) observed in the water quality analysis from the 2013 Lower Ganargua Creek Tributary Assessment. The project first removed smaller, denser debris of the log jam and placed it in a wooded area near the creek and evaluated the larger logs to be used in a Locked Logs method, to adjust the stream flow, create coarseness along the bend and enhance aquatic habitat. The logs are placed in the streambank so they angle downstream mimicking the natural occurrence of fixed trees to dissipate stream energy and anchoring the eroding bank with stone riprap. A buffer of trees and shrubs will be added to further protect the stream. This project will be monitored for total suspended solids, such as sediment, after the streambank improvements to measure effectiveness. The impact this project has on the floodplain has been highlighted by local media for the partnerships and the process for getting community minded conservation work constructed in Wayne County.

Yates – Town of Jerusalem Culvert Inventory



A physical inventory of 128 culverts, or structures that allow water to flow under a road or similar obstruction, was completed by the Yates County Soil and Water Conservation District (SWCD) for East Bluff Drive in the Town of Jerusalem, Yates County. Due to steep slopes, poor soil, and stormwater debris from a forested watershed, this area has experienced significant flooding. The inventory obtained GPS locations of all town culverts and physical measurements were made to document culvert size, material, inlet and outlet conditions, erosion issues, and need of repair or replacement. A ranking system of high, medium, and low priority was developed from the information for culvert maintenance and replacement. This information was published in a spiral bound format and provided to the town highway department for use in planning maintenance and repair work. This allowed targeting of high priority issues to reduce potential flood damage.

Open Space and Forestry

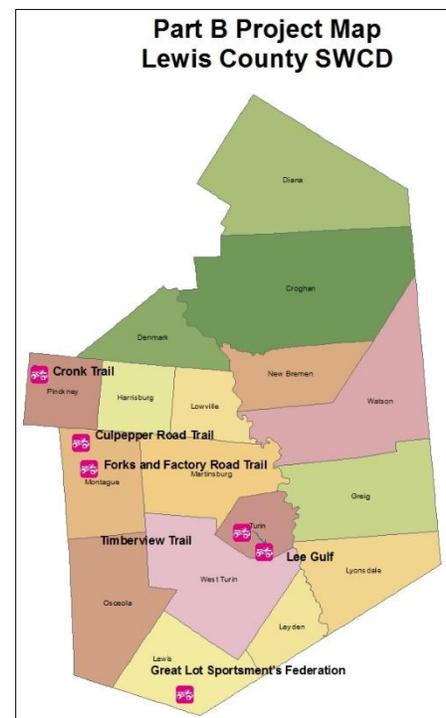
Lewis - Recreational Trail Environmental Assessment for the Lewis County Trail System



Lewis County SWCD conducted environmental assessments on the county trail system.

The Lewis County Soil and Water Conservation District (SWCD) in partnership with Lewis County Department of Recreation, Forestry and Parks is improving existing trails and adding new trails to the countywide trail system for motorized and non-motorized use. The District performed environmental assessments utilizing the state's uniform State Environmental Quality Review (SEQR) protocol. The environmental assessment provides natural resource information for each trail including soils information, hydrologic characteristics, and types of vegetation found to verify non-wetland conditions. The

District also evaluated each trail for necessary maintenance and rehabilitation. In previous years the county improved trailheads and parking on the Culpepper, Cronk, and Forks and Factory Road Trails. Between June 2014 and December 2015 the county improved trails by replacing bridge decking and culverts, and re-routing trails based on the existing conditions and environmental assessments conducted by the District. The Great Lot Sportsmen's Club Trail was found to have no significant environmental impact and with necessary maintenance needs identified, the trail was added to the trail system. Improvements identified will reduce erosion by addressing drainage issues. Giant hogweed was found at the beginning of the trail system and will need to be eradicated to prevent spreading and protect human health as this species is particularly dangerous. Additionally, the Lee Gulf Trail will be re-routed to avoid wetlands, upon assessment findings.



Oneida – Harvesting of Reforestation Area

The Oneida County Soil and Water Conservation District (SWCD) manages all county forest lands including the responsibility for directing and implementing the development of projects for harvesting timber and the creation and maintenance of recreation sites. As embodied in the County's Forest Lands Management Plan the District conducts all operations necessary to designate timber stands for harvest, oversee the harvesting process, monitor lumber market conditions, and ensure compliance with all local, state, and federal laws, rules, and regulations regarding environmental impacts of forest land usage. The major types of water pollutants that can be generated from forest management disturbances to the forest ecosystem include sediment, nutrients, pesticides, and logging debris. Sediment is the most common pollutant resulting from silvicultural activities. Sediment principally results from erosion of soil, but may also include organic matter. Excessive sediment upsets balanced ecology within streams by smothering bottom

dwelling organisms in the water, interfering with photosynthesis by reducing light penetration, serving as carriers of nutrients and pesticides, inhibiting fish reproduction, and altering stream flow. Providing oversight of timber harvest operations, the District monitored the placement of water bars for erosion control, stabilization of the construction entrance to reduce sediment runoff, and ensured only marked trees were harvested for proper forest management. The District also provided post-harvest inspections to ensure site stability.

Oswego - Forestry Management Plan Development and Updates

The Oswego County Soil and Water Conservation District (SWCD) developed three forest management plans and updated five others on a total of 876 acres in Oswego County. The District met with each landowner to walk the property and obtain their goals/objectives for the land. A detailed inventory was conducted and the data was processed using specialized software and then analyzed. This analysis was used as the basis for the forest management plans. Each document includes the identification and description of the natural resources (soils, water, wildlife, recreation, and forests) on the property, recommendations and options available for managing those resources, a schedule of management actions, a forest stand map, and a soils map. This project helped to educate eight landowners, promoted sustainable forest management practices and will provide protection of water quality in Oswego County and New York State.

St. Lawrence – Private Forestland Management Plan Development

In 2015, the St. Lawrence County Soil and Water Conservation District (SWCD) forester authored five forest management plans for woodland owners. The plans focused on the goals of the landowners and implemented sustainable management practices designed to enhance ecological value on 448 acres. Factors that were considered included wildlife, diversity, timber production, forest health, recreation, soil erosion, wetlands, and invasive species.

The plans required an inventory of the woodlands for timber resources, wildlife, water features, and cultural structures. At each plot, trees were tallied, and observations of ground cover, regeneration, and other important features were made. The quality and vigor of trees were evaluated at each plot to help determine the overall health and productivity of the site. Regeneration was noted at each plot by the species, abundance, and size to aid the direction of management decisions. Any wildlife observed was noted during the site visit. Signs of past wildlife activity and habitat were noted as well. Cultural resources in the form of stone walls, old foundations, and existing structures were noted as special features that the landowner may be interested in preserving.



Forestry plans developed by SWCDs help landowners protect water quality.

Westchester - Demonstration of Forest Regeneration in the Croton Watershed



The Westchester County Soil and Water Conservation District (SWCD) hired a contractor to encircle half an acre of forest at Hilltop Hanover Farm in Yorktown with deer fencing. The purpose of the deer enclosure area is to keep deer outside the demonstration area in order to monitor forest regeneration without the presence of white-tailed deer. The SWCD and the Watershed Agricultural Council were the financial contributors to the project. The



eight-foot-tall, wire-mesh fencing, supported by wood posts and two entry gates, prevents deer from further browsing in the forest plot. Deer populations in some areas of the Hudson River valley are up to ten times higher than sustainable levels. One deer can browse on thousands of native plants in a single day. With the enclosure, researchers will be able to study the regenerative capabilities of forests over time following the cessation of deer browsing. The research will help land managers and others to improve their strategies to control deer and adopt forest health management practices. The research will be coordinated by a forester from the Watershed Agricultural Council. Before the fence was installed, Westchester County Parks, Recreation and Conservation Department personnel felled select trees in the forest plot to increase sunlight penetration to the forest floor. Volunteers have also begun eradicating invasive plant species growing in and next to the plot. The fencing is adjacent to a hiking trail at Hilltop Hanover Farm. A public educational sign has been installed next to the forest plot and hiking trail explaining the project.

Stormwater and Green Infrastructure

Albany - Conservation Plant Material Center



Albany SWCD plants raised beds with conservation plant material for rain garden maintenance.

The Albany County Soil and Water Conservation District (SWCD) installed a Conservation Plant Material Center at the Cornell Cooperative Extension facility in Voorheesville.

The center consists of 12 raised beds that are 4ft. by 8ft. and is enclosed by a 31ft. by 34ft. fence. Fifty-five native plants, consisting of 11 different species,



were planted in the raised beds. Since 2008, the Albany County SWCD, Cornell Cooperative Extension, and the Albany County Stormwater Coalition worked together to install 10 demonstration rain gardens throughout the

County on public property. Rain gardens allow rainwater runoff from impervious surfaces to be collected and absorbed into the ground and filtered by the plants. The new Plant Material Center will provide stock to be used by the SWCD for rain garden installation and maintenance. The District will continue to utilize the plots as a nursery to grow native plant stock for years to come instead of relying on outside sources.

Cattaraugus - Stormwater BMP Demonstration Project



Completed Bioretention Terrace before planting.

The Cattaraugus County Soil and Water Conservation District (SWCD) worked with the County Department of Public Works, and volunteers from the County Water Quality Council on a multipurpose bioretention terrace constructed to showcase green infrastructure practices for stormwater management. The bioretention terrace addresses runoff from 3 acres at the site and steep slopes that were a maintenance issue. A wide variety of native plants were used for stormwater treatment. “We selected plants that would flower at different times and that will take up nutrients,” Brian Davis the District

Manager for Cattaraugus SWCD said. By combining a grass buffer strip and filtering surface water through surface mulch and planting soil, a sand bed, organic layer, plant material and infiltration chambers, the water will infiltrate the soil. It will also improve the quality of stormwater runoff by allowing more of the water to be absorbed into the soil, where it can recharge groundwater and reduce the volume of stormwater runoff that needs to be managed.



Cattaraugus SWCD staff and volunteers sorting plants for the bioretention terrace (left) and planting (right).

Hamilton - Stormwater and Erosion Control Projects

Tourism is the primary industry in Hamilton County and pristine lakes and streams provide visitors with fishing, boating, and swimming opportunities. This project focuses on the non-point source pollution concerns of municipalities and residents. Various educational outreach tools were utilized to increase awareness of water quality impairments.

The Hamilton County Soil and Water Conservation District (SWCD) worked with several county and town highway departments to implement streambank erosion control projects utilizing natural channel design. These projects were used as examples to illustrate the effective techniques that highway departments can use to stabilize streambanks to protect streams and bridge abutments. At County Highway superintendent's meetings soil erosion control projects were discussed with effective stormwater and erosion control best management practices that alleviate water quality problems.



Hamilton SWCD uses a hydroseeder for erosion and sediment control.

Hamilton SWCD highlighted several town culvert replacement projects that were implemented to improve fish passage. Photos, cost, and natural resource benefits were presented along with town highway superintendents sharing their satisfaction with the projects. Hydroseeding projects were presented at the meetings to illustrate the environmental benefits for erosion and sediment control.

The District planned, developed, and constructed a Green Infrastructure Demonstration Project at the District office including two rain barrels (supplying water to pollinator and vegetable gardens), a bioswale, and rain garden. Several tours were organized and held to highlight the project. Educational outreach also included an information booth at two area events that showcased the display board and handout. A total of 821 people attended green infrastructure demonstration project tours and visited the District's informational booths. School presentations were given for students of all ages. "When it Rains, it Drains" was one of 6 presentation stations at the District's Conservation Field Day event for 5th and 6th graders. Ninety students and twenty adults learned about rain gardens, rain barrels, and bioswales, and how they prevent stormwater pollution.

Adirondack Waterfest is a one day educational and fun event highlighting the importance of water quality. Waterfest was organized by the District along with local community partners. Over 400 adults and children enjoyed the 50 demonstrations and educational booths. A 3D river model was used to illustrate how streams naturally flow, how streambank erosion occurs, and ways to prevent it. Other water related presentations included invasive species prevention, live fish demonstrations, stormwater prevention, road salt alternatives, and wastewater treatment.

Through these projects people become aware of how their everyday activities can adversely impact water quality through erosion and polluted stormwater. Outreach by the District educated municipalities and residents on how making good choices can have a positive impact on their environment and their community.

Monroe – Pollution Prevention for Municipal Operations



Monroe SWCD aid municipalities with pollution prevention by using catch basin inserts to assist in spill prevention.

The Monroe County Soil and Water Conservation District (SWCD) developed a survey regarding Pollution Prevention for Municipal Operations. The survey was distributed to all 27 Municipal Separate Storm Sewer System (MS4) communities within Monroe County. It consisted of six questions requesting distances from fixed facilities to nearby water-bodies, designations for the watershed in which the facility was located, the pollutant of concern, if the source of the pollutant is identified, and if a Best Management Practice (BMP) was currently in place at the facility to address the pollutant.

The District received nine surveys and the District staff ranked each municipality based on a point system. The District was able to work with four of the MS4 communities to distribute 14 spill kits (stationary and portable) along with three catch basin inserts to assist in leak and spill prevention and municipal yard sediment

control. Stationary spill kits were placed in the vehicle maintenance areas, fueling areas and fluids room at the Highway/Dept. of Public Works. The portable spill kits were given to staff at the Monroe County DOT and Town of Webster Highway Department to carry in their vehicles for emergency spill prevention on projects. The catch basin inserts were placed in the Highway/Dept. of Public Works yards that had catch basins located in areas that were receiving sediment loading. Three of four communities had fixed facilities located within a watershed. The goal of the project was to work with municipalities to implement best management practices (BMP) that reduce pollution. These BMPs will be monitored into 2016 and the District plans to continue working with the remaining communities that submitted surveys.

New York City (Bronx) - Green Infrastructure Retrofit on Private Property

The New York City Soil and Water Conservation District (SWCD) conducted a green infrastructure retrofit project on an apartment building in the Bronx. Two stormwater planters (8' x 12' and 8' x 16', both 3.5' deep) were constructed with pressure treated lumber, lined with pond liner, and filled with gravel and soil. Native grasses and herbaceous species were planted to create a native habitat as well as keep the maintenance requirement minimal.

Residents were consulted and adjustments made according to their suggestions. Residents expressed their interest in gardening in the backyard. The stormwater capture planters are situated adjacent to an unpaved raised area of the backyard. The District was able to create a raised bed planter in this area for the residents without reducing the sizes of the stormwater capture planters to accommodate their request.

The size of the planters are large enough to retain nearly 2,000 gallons. After a heavy rain event the overflow water in the planter will drain to the raised area and will be infiltrated. Thus the project has created 224 square feet of pervious surface in an otherwise impervious backyard.

New York City (Manhattan) - Green Infrastructure Tour



Jacob Javits Convention Center visited during NYC SWCDs GI tour has 14 different varieties of sedum on 292,000 sq. ft. of green roof.

The New York City Soil and Water Conservation District hosted its 5th Annual Green Infrastructure (GI) Bus Tour. Three green roof projects and one multiple GI practices site were selected: Kelly Street garden, Lenox Hill Neighborhood Housing, Five Borough Park's headquarters, and Jacob Javits Convention Center. The Javits Center roof is a 292,000 square foot green roof planted with 14 different varieties of sedum plants that are grown on a regional production farm in upstate New York. It is the second largest green roof on a single, free-standing building in the U.S. providing a pleasing view of an expansive green space for nearby buildings. The Lenox Hill Neighborhood Housing building's green roof captures 4,500 gallons of stormwater that would otherwise flow into the City's sewage system. The Green Roof is used as an

Environmental Science Lab for the three- and four-year olds in the Early Childhood Center and youth in the Afterschool Program and Summer Camp. The soil holds a variety of plants and vegetables that can thrive on a rooftop environment of limited sunlight and sometimes high winds, including tree pansies, Echinacea, a companion planting of beans, corn and squash, heirloom tomatoes, black eyed Susan's, and much more. In 2007, the Five Borough Technical Services Division of the NYC Department of Parks



and Recreation installed its first green roof system atop their headquarters. The 5-Borough green roof distinguishes itself from others, as it is the only known green roof in the country to feature distinct systems side by side. These systems vary by type of growing medium, depth of growing medium, and plant selection. By

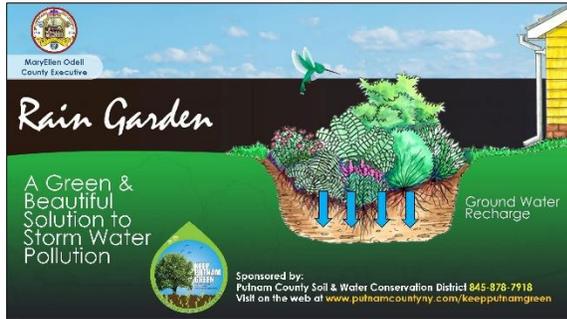
using a variety of planting systems and monitoring their progress, they are identifying the types of green roof systems that will thrive in



The Lenox Hill Neighborhood Housing building's green roof captures 4,500 gallons of stormwater that would otherwise flow into the City's sewage system (above & left).

the NYC urban environment. The Kelly Street Garden has the potential of collecting 13,500 gallons of stormwater each time it rains, or more than 250,000 gallons annually via its rain harvesting system which helps reduce pollution in the East River. More than 30 professionals participated in the tour on a rainy day, which was appropriate for observing green infrastructure in action.

Putnam – Veteran’s Memorial Park Rain Garden



The Putnam County Soil and Water Conservation District (SWCD) built a rain garden in the Veteran’s Memorial Park. Near one of the Veteran’s monuments a chronic flooding issue was addressed by creating a rain garden. The rain garden is designed to collect roof water from an adjacent building and the overflow water discharges into a catch basin. The project engineer also designed a rain garden sizing tool to go with the demonstration rain garden and a design

brochure that is available to residents for installing a rain garden on residential property. To promote the project advertising space was purchased at a local movie theater to help inform the public about rain gardens and the tools available by the Putnam County SWCD.

Rockland - Rain Barrel and Rain Garden Demonstrations and Riparian Buffer Planting



The Rockland County Soil and Water Conservation District (SWCD) conducted a Rain Barrel Project. Residential irrigation can account for 40% of domestic water use. The benefits of rain barrels include reducing the volume of water flowing offsite typically into a storm sewer, while providing a free source of irrigation for lawns and gardens. The District publicized to public libraries, schools, village public works departments, and village halls (in nineteen towns and villages), that they can receive a free 40 gallon rain barrel if they commit to hosting a demonstration project to introduce the benefits of rain barrels to the public. Two rain barrels were distributed to Rockland BOCES as a Student Housing Demonstration Project through the Plumbing/HVAC Program (pictured). To aid in public education efforts, two District educational signs were installed to promote the water conservation effort at BOCES. A total of 15 students and faculty were educated at the BOCES demonstration site. The placement of the signs at the dorms increased student awareness of water

conservation efforts and promoted water savings on campus. In addition, the District raffled off one rain barrel at the Annual County Government Day/ Youth Fest Event.

A rain garden installation was constructed at the entrance to the Orangeburg Public Library and Building Department entrance. Located on a heavily trafficked road in the Town of Orangetown, the rain garden

had 279 trees, shrubs, and herbaceous plants installed to absorb and filter runoff from the parking lot. Additionally, 35 native trees and shrubs were installed throughout the foundation of the building to increase curb appeal and promote native plant installation. Educational signs will be installed at the library to increase public awareness of green infrastructure.

Lastly, the District installed a Riparian Buffer, or trees and shrubs that grow next to a stream and are critical for stream health. A buffer was installed in the Sparkill Creek Watershed at Orangetown Park Property, which was impacted by heavy erosion and under-maintained. NYS DEC Hudson River Estuary Program’s Trees-for-Tribs initiative provided 117 native trees and shrubs for installation. Prior to installation, removal of 300 pounds of Mile-a-Minute Vine were extracted via boom mower and hand pulling methods. District Staff worked with the Lower Hudson Partnership for Regional Invasive Species Management (LH PRISM) and Orangetown Parks Department on proper removal methods. The site is now more aesthetically pleasing which will increase park visitation and stabilize the banks along the Lower Segment of the Sparkill Creek, which is classified as impaired due to dissolved oxygen demand, siltation, and sedimentation. In addition, the vegetation adds forested ground cover to the banks, providing increased habitat for riparian organisms. Twenty-five volunteers from Dominican College, St. Thomas Aquinas College, Sparkill Creek Watershed Alliance, and Rockland County SWCD assisted in the installation of these plants.

Suffolk – Bioswale Project in the Village of Shoreham

The Suffolk County Soil and Water Conservation District and the Village of Shoreham have created this Bioswale. It is designed to capture polluted stormwater before it reaches Long Island Sound. This Bioswale was funded in part by the Environmental Protection Fund through the New York State Soil & Water Conservation Committee. We hope you appreciate the importance of this project.

What is a Bioswale?
 Bioswales are landscape elements designed to remove pollution from surface runoff water. They consist of a swaled drainage course with gently sloped sides and filled with vegetation, compost and/or riprap. The water's flow path, along with the wide and shallow ditch, is designed to maximize the time water spends in the swale, which aids the trapping of pollutants. Depending upon the geometry of land available, a bioswale may have a meandering or almost straight channel alignment. Biological factors also contribute to the breakdown of certain pollutants.
 A common application is around streets or parking lots, where automotive pollution is collected by the paving and then flushed by rain. The bioswale treats the runoff before releasing it to the watershed or storm sewer.

Native Plants...
 When projects like this are planted with additional vegetation it is important to use native species because they are adapted to our local climate and rainfall; once established they seldom need watering or fertilizing. All of the plants are usually grown locally, attract butterflies, other pollinators, and provide food for birds.

Stormwater runoff is generated when rain and snowmelt flow over land or impervious surfaces (streets, parking lots, rooftops, etc.) and does not seep into the ground.

The Suffolk County Soil and Water Conservation District (SWCD) and the Village of Shoreham created a bioswale, designed to capture polluted stormwater before it reaches the Long Island Sound. Bioswales are landscape elements designed to remove pollution from surface runoff water. They consist of sloped sides to

retain water for infiltration. Vegetation is planted to filter pollutants. The Village of Shoreham is located on the North Shore of Suffolk County adjacent to the Long Island Sound. The Village's storm water runoff had been draining unfiltered directly into the Sound. A new plan was developed to address the Village’s stormwater and the bioswale was a project identified in the overall plan. The bioswale was installed in a wooded area owned by the Village on Tower Hill Road and the stormwater was redirected to this area. An educational sign is being placed at the site to educate residents (pictured).

Washington – Stormwater Management Demonstration, Kingsbury Rain Garden Installation



Washington SWCD built a rain garden to capture runoff from the county's highway maintenance facility.

The Washington County Soil and Water Conservation District (SWCD) built a rain garden at the new highway maintenance facility. The rain garden was built to capture and filter runoff from impervious services around the garage. Drought conditions and clay ground required some heavy equipment for ground preparation to insure a successful planting session. Topsoil was brought in to increase plant survival rates. Students in an environmental conservation and forestry class aided in planting 500 native species. The Southern Adirondack BOCES students placed mulch on the garden to help ensure sustainability of the plantings.



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