USDA United States Department of Agriculture

Natural Resources Conservation Service

PENNSYLVANIA NRCS FY 2021 ACCOMPLISHMENTS

PENNSYLVANIA NATURAL RESOURCES CONSERVATION SERVICE

The USDA Natural Resources Conservation Service (NRCS) provides innovative conservation solutions to restore, enhance and protect Pennsylvania's private working lands.

Mark Myers, NRCS, (Right) reviews a conservation plan with Mike Brubaker of Brubaker Farms of Mount Joy, PA. Mike and his family are recipients of the 2021 Aldo Leopold Conservation Award.

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2021: A YEAR IN REVIEW

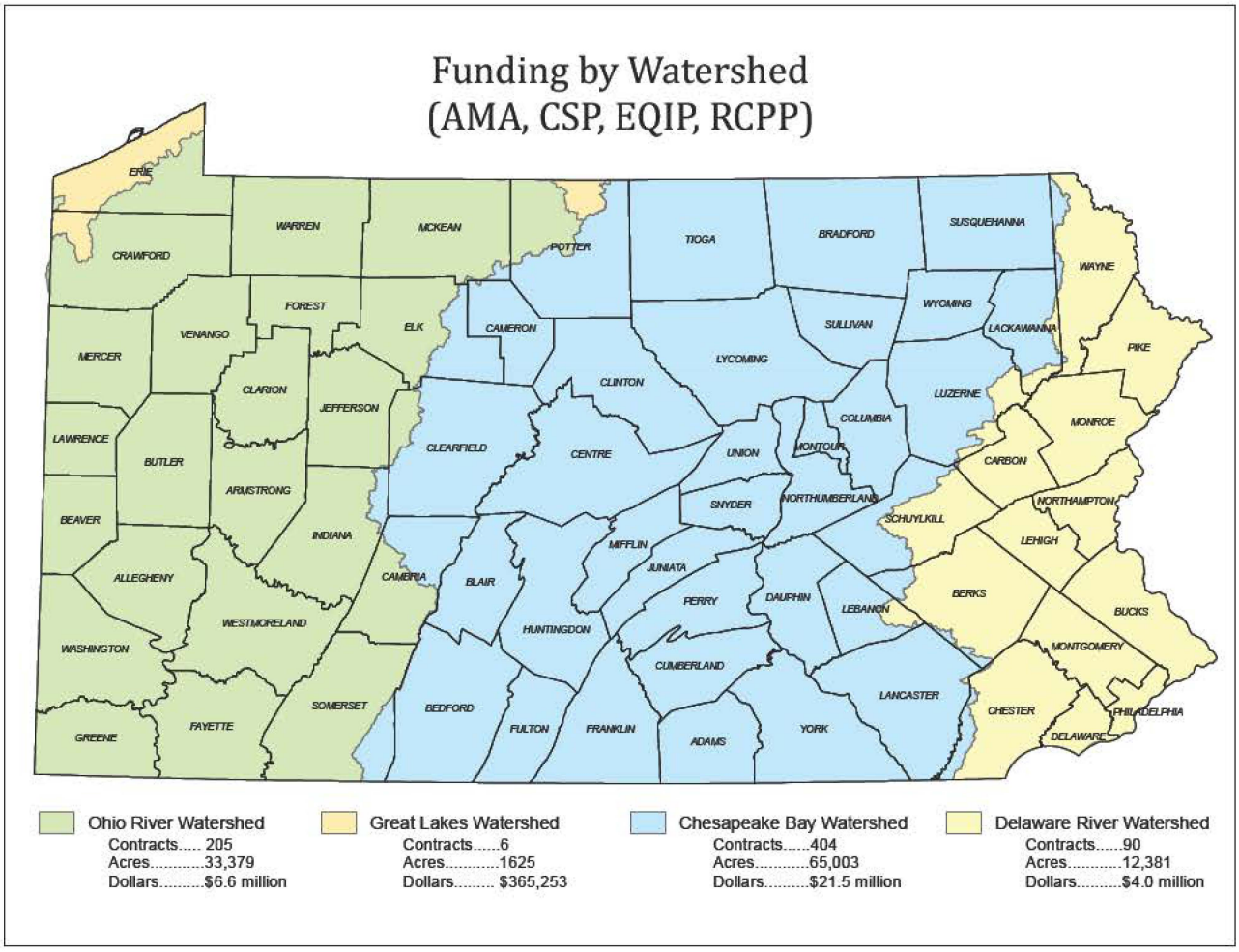
Our voluntary conservation programs provide technical and financial assistance to help farmers, woodland owners, and other land managers address natural resource concerns such as water quality, soil erosion, wildlife habitat, flooding, landscape fragmentation, and much more. Using our Strategic Approach to Conservation, NRCS leverages partnerships across the Commonwealth of Pennsylvania to invest in landscape-scale conservation.

This report captures Pennsylvania NRCS's and its partners' successes throughout fiscal year (FY) 2021, which ran from October 1, 2020 to September 30, 2021.

31,792

CONSERVATION PRACTICES APPLIED

In FY 2021, more than 30,000 conservation practices were applied on Pennsylvania's private lands to help improve soil, air, and water quality; enhance wildlife habitat; and preserve land for future generations.



PENNSYLVANIA NRCS FY 2021 INVESTMENTS ON PRIVATE WORKING LANDS

EQIP Environmental Quality Incentives Program

53,272

475

$22.2 M

AMA Agricultural Management Assistance Program

240

16

$557,169

CSP Conservation Stewardship Program

56,996

198

$7.9 M

* Includes CSP and CSP-GCI

RCPP Regional Conservation Partnership Program

1,880

16

$1.7 M

* Includes RCPP-EQIP

CTA Conservation Technical Assistance

140,144

*Acres planned

1,749

Symbol Key


Acres


Funding


Contracts


Plans

INITIATIVES

National Water Quality Initiative (NWQI)

$1,383,397

Organic Initiative

(Certified & Transition)

$183,126

High Tunnel Initiative

$157,560

Great Lakes Restoration Initiative (GLRI)

$176,993

Climate Smart Initiative

$391,194

TOP CONSERVATION PRACTICES APPLIED

Practice	Count	Measurement
Livestock		
Waste Storage	79	No
Heavy-Use Area	337,550	SF
Trails & Walkways	30,797	Ft
Stream Crossings	53	No
Fence	601,968	Ft
Roof Runoff	482	No
Prescribed Grazing	3,045	Ac
Agronomic		
No-till	1,138	Ac
Cover Crop	40,775	Ac
Nutrient Management	32,847	Ac
Soil Erosion		
Diversion	29,418	Ft
Waterway	7,357	Ac
Terrace	42,254	Ft
Lined Outlet	61,868	Ft
Buffers		
Herbaceous Buffer	25	Ac
Forest Buffer	150	Ac

PRESERVING PENNSYLVANIA'S LANDS

CONSERVATION EASEMENTS PROTECT MILITARY INSTALLATIONS

The Kittatinny Ridge project was initially brought forth as a Sentinel Landscape project. The project was more fully developed in several brainstorming sessions with key partners. The goal of the Sentinel Landscape project for the Kittatinny Ridge in Pennsylvania was to strengthen military readiness, conserve natural resources, bolster agricultural and forestry economies, and increase climate change resilience.

Although Pennsylvania was never awarded a Sentinel Landscape for the Kittatinny Ridge, the ideas and goals for the Kittatinny project were transferred into a Regional Conservation Partnership Program (RCPP) project. The RCPP project will use conservation easements as buffers to protect key military installations in Pennsylvania. Increasing development pressure in the land surrounding these military installations has created concern in recent years.

Light pollution from developed areas impacts flyways used by military aircraft conducting night training flights and other activities. Halting development in these areas would ensure that light pollution is prevented now and in the future. Additionally, easements would create a permanent buffer between developed areas and the noise of artillery drills and other military activities.

Since conserving land through permanent easements is a goal shared by several state, local, and private preservation and conservation entities, these entities partnered with the Pennsylvania Department of Agriculture (PDA) as the lead partner to create the Kittatinny Ridge RCPP project for preserving agricultural and forest easements. Over $10 Million in funding was awarded to this RCPP project to permanently preserve land through forest and agricultural land easements.

Photo: The nature Conservancy

ACEP-ALE

Ag Conservation Easement Program - Agricultural Land Easement

Enrollments*

986

$1,794,624

Closed/Acquired

372

$542,104

* Includes RCPP ALE.

ACEP-WRE

Ag Conservation Easement Program - Wetlands Reserve Easement

Closed/Acquired

100

$347,188

Symbol Key

Acres

Funds

In FY21, PA NRCS provided $347,188 for wetland easements.

IMPROVING SOIL HEALTH

SOIL HEALTH

For the second year in a row, Pennsylvania NRCS's soil health cadre delivered an online version of the Soil Health and Sustainability Training to 30 field staff from NRCS, Conservation Districts, and our partners. Two field days, one in Butler County and the other in Northumberland County, were organized in addition to the online presentations to provide the students with hands-on training and to learn directly from soil health farmers. NRCS has achieved its goal of providing this training to nearly 200 planners by January 2022.

Pennsylvania NRCS's new soil health tunnel was featured at the Penn State University's 2021 Ag Progress Days event in Centre County. Visitors could walk through the 10-foot-high tunnel and learn about basic soil principles including soil biology, soil chemistry, soil forming factors, and soil landscapes in Pennsylvania.

TECHNICAL SOILS ASSISTANCE

NRCS Soil Scientists provided over 2,000 hours of technical soil services in Pennsylvania in FY 2021. This affected over 56,000 acres and benefited approximately 1,800 people. Types of services included completing wetland and highly erodible land determinations for Food Security Act compliance; creating video study materials for the Envirothon; providing conservation planner training and site evaluations for conservation practices; soil survey mapping; assisting with soils data for various USDA programs; soil judging competitions; Farmland Protection Policy Act evaluations; PA Boot Camp trainings; and soil health training and outreach events.

Soil tunnel at 2021 Ag Progress Days.

SOILS DATA UPDATE

The Annual Soil Survey Data Refresh took place in September 2021 and updated soil survey data is now available in Web Soil Survey. Most changes were the result of Evaluation projects that examined the consistency of soil series across Major Land Resource Areas. In the majority of cases, this did not lead to any changes in interpretations or soil series.

Eleven new interpretations were added and will be available for download in Web Soil Survey:

1. AGR - Industrial Hemp for Fiber and Seed Production
2. DHS - Emergency Land Disposal of Milk
3. ENG - Deep Infiltration Systems
4. ENG - Lined Retention Systems

5. ENG - Shallow Infiltration Systems
6. ENG - Unlined Retention Systems
7. ENG - Ground-based Solar Arrays, Ballast Anchor Systems
8. ENG - Ground-based Solar Arrays, Soil-based Anchor Systems
9. FOR - Drought Vulnerable Soils
10. SOH - Dynamic Soil Properties Response to Biochar
11. SOH - Limitations for Aerobic Soil Organisms

NATIONAL RESOURCES INVENTORY (NRI)

The National Resources Inventory (NRI) program collects and produces scientifically credible information on the status, condition, and trends of land, soil, water, and related resources on the Nation's non-federal lands in support of efforts to protect, restore, and enhance the lands and waters of the United States. In FY2021, Pennsylvania reviewed 903 segments from 2020 and finished first in the nation.

FOOD SECURITY ACT COMPLIANCE

Despite continued workplace and travel restrictions imposed by COVID, Pennsylvania NRCS responded to 16% more referrals for Highly Erodible Land (HELC) determinations and Wetland Conservation (WC) determinations than in previous years. Designated staff completed 1,139 HELC determinations and 1,033 WC determinations. Two new Resource Soil Scientists received training and helped respond to the Compliance workload as well as supporting technical soil services. Compliance staff participated in a review of HEL policy training and wetland identification field training delivered across the three administrative areas.

Pennsylvania, along with 46 other U.S. States and the Caribbean and Pacific Islands, published Farmed Wetland Hydrology Indicators for use in Food Security Act wetland determinations for public comment in the Federal Register until October 2021. Prior to publication in the federal register, Pennsylvania's proposed Indicators were reviewed and modified based on feedback provided by the PA State Technical Committee. The Indicators will eventually be published in the Field Office Technical Guide.

DELAWARE COUNTY SOIL SURVEY UPDATE

In FY 2021, NRCS's Soils and Plant Sciences Division continued work that began in 2020 to update the Delaware County Soil Survey. This data was published in the 1960's and has not undergone a significant review since. Land use has changed, and some soil series concepts require revision. In 2021, most of the work consisted of editing approximately 5,000 acres of spatial data to better reflect the landscape. Current geographic information systems remote sensing resources were utilized to capture expansions of urban areas, quarries, and other major land use disturbances that would fundamentally change the soil properties that were originally present. Field data was collected on select soil series in mafic/gneissic geology to update the Official Series Descriptions.

Mark Goodson, NRCS, demonstrates the principles of soil health during a training.

MANAGING FORESTS AND WILDLIFE

FORESTRY ENHANCEMENT WITH THE CONSERVATION STEWARDSHIP PROGRAM

Non-Industrial Private Forest Landowners are increasingly tapping into forest conservation opportunities through the Conservation Stewardship Program (CSP). In FY 2021, 9,041.7 forestland acres were enrolled or renewed through CSP on 81 Contracts. This covered $1,420,570 in financial assistance obligations throughout the Commonwealth.

CSP aids participants by helping them increase their level of forest stewardship. CSP offers forest managers an opportunity to enhance their operations while adopting conservation enhancements that can improve the conservation of natural resources. Popular enhancements used on Pennsylvania forestlands through CSP include brush management to improve wildlife habitat, facilitating oak forest regeneration, and crop tree management for mast production.

TABLE 1: FY 2021 TOP 5 CONSERVATION PRACTICES PLANNED ON FOREST LANDS

PRACTICE	ACRES
Forest Stand Improvement	3,636
Brush Management	2,527
Herbaceous Weed Treatment	1,612
Tree/Shrub Establishment	495
Early Successional Habitat Development/Management	494

EQIP Forestry
Environmental Quality Incentives Program

1,495

27

$719,499

Forest Management Plan Development
(Conservation Activity Plan)

10,664

80

$147,451

MANAGING FORESTS FOR WARBLERS

Pennsylvania is a heavily forested state with forest lands totaling 16.8 million acres which covers about 58% of the state. Non-industrial private forest lands cover about 11.5 million acres in Pennsylvania which is owned and operated by more than 738,000 private forest landowners. Through financial and technical assistance, and in coordination with partners, NRCS is making significant steps towards a goal of maintaining and improving the health and resiliency of forested ecosystems on private forest lands.

In FY 2021, the multiple NRCS initiatives and programs that provided assistance on forest lands included EQIP Forestry, EQIP Forest Management Plan Development, EQIP Working Lands for Wildlife Golden Winged Warbler Initiative, and CSP Forestland. These individual programs and initiatives share a common thread of addressing the degraded health and resiliency of PA's forests.

WORKING LANDS FOR WILDLIFE

Through the Working Lands for Wildlife Initiative, NRCS is assisting private forest landowners in creating and maintaining desirable habitat for golden-winged warblers. The initiative is focused on encouraging the growth of desirable trees, such as oak and hickory, and controlling invasive species in the forest understory.

Conservation efforts in support of the golden-winged warbler benefit many other species that depend on similar habitat. Forest management is crucial in creating and maintaining habitat necessary to sustain breeding populations of golden-winged warbler.

Golden-Winged Warblers

1,279

24

$882,841

Symbol Key

Acres

Contracts

Funds

BAT BENEFITS

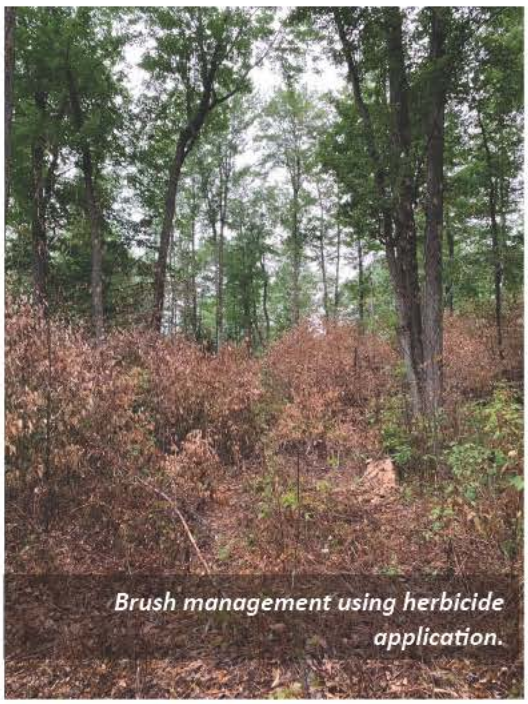
NRCS also manages forest and wetland acres to benefit bat species like the Northern long-eared bat, the Indiana bat, the tri-colored bat, the little brown bat, and others. These conservation efforts include restoring forest ecosystems by both controlling invasive plants and releasing/planting native tree species, like shagbark hickories, that provide vital roosting cover for bats in the spring and summer months. Future work will include man-made roosting structures that should increase bat species' use of wetland easements and young-forest habitats.

Bats provide services to ecosystems such as spreading seeds and controlling pest populations.

FOREST MANAGEMENT DEMONSTRATION THROUGH GREAT LAKES RESTORATION INITIATIVE

Brent Bacon is a private forestland owner located in Ulysses, Pennsylvania. His forestland consists of 110 acres of Northern Hardwood Forest which includes Hemlock, Beech, Sugar Maple, Ash, and Black Cherry trees. Bacon is an active participant in the Great Lakes Restoration Initiative (GLRI) as part of the demonstration network in the Genesee Watershed in Potter County. The demo network allows multiple partners to work together to implement innovative practices in order to promote conservation. The Great Lakes Farm Demonstration Network is funded through a cooperative agreement between Headwaters RC&D and USDA's Natural Resources Conservation Service (NRCS).

As an avid outdoorsman, Bacon's primary goal is to manage his property for wildlife habitat. He has been working cooperatively with NRCS staff and Headwaters RC&D to manage his forest resources to control undesirable hardwood species, such as beech, to allow for regeneration of desirable mast producing hardwoods to benefit wildlife habitat.



Brush management using herbicide application.

The following practices have been implemented in 2020 as part of the forest management plan:

- Brush management using chemical treatment was applied to 16 acres during the summer that targeted the American Beech.
- Herbaceous weed control was applied to the same 16 acres to control noxious weeds and plant species on the forest floor.
- A two-acre riparian forest buffer was installed with a mixture of Northern Hardwood species to improve water quality.

Bacon will continue to manage the 16 acres that received the brush management and herbicide application to allow for the regeneration of desirable hardwood tree species such as oak and black cherry.

As part of the GLRI network, Bacon kept records regarding his forest management planning, soils, water quality, rainfall data, and tree regeneration. He also participated in filming educational videos with the Headwaters RC&D as part of a video series released in 2020.

ENHANCING WATER QUALITY

NATIONAL WATER QUALITY INITIATIVE (NWQI)

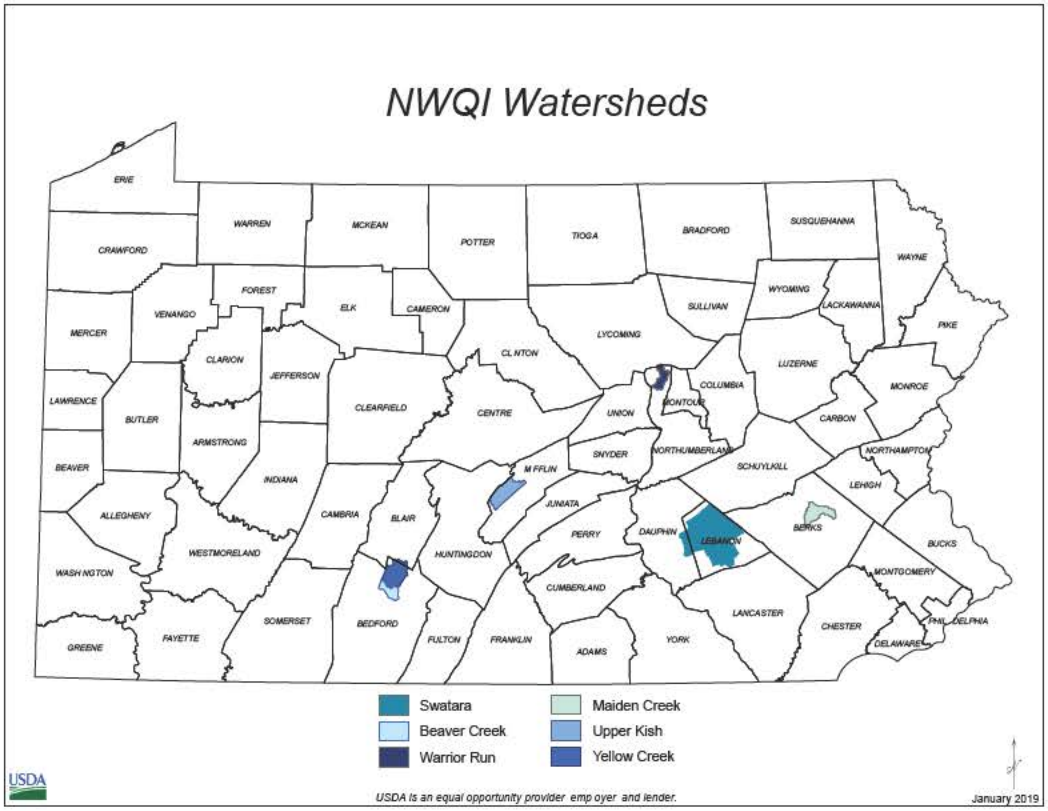
NRCS provides financial and technical assistance to farmers and forest landowners interested in improving water quality in priority watersheds with ag impaired streams through the National Water Quality Initiative (NWQI). NWQI is currently being offered in the following Pennsylvania watersheds (because of the significant natural resource challenges they face):

- Warrior Run
- Beaver and Upper Yellow Creeks
- Upper Kishacoquillas Creek
- Swatara Creek
- Maiden Creek

Our goal at NRCS is to improve water quality by preventing sediments and nutrients from reaching streams and source water. The ultimate goal is for the water quality to be improved, source water to be protected, or for these streams to be removed from the ag impaired streams list.

In FY 2020, PA NRCS conducted outreach and implemented conservation practices in all the NWQI watersheds. Stream monitoring was conducted to establish baseline levels and will continue to track changes over time.

Of the watersheds listed, Swatara Creek and Maiden Creek watersheds are source water protection pilot projects aimed at protecting the source of public drinking water for communities.



SOURCE WATER PROTECTION EFFORTS REDUCE SEDIMENT DELIVERY IN SWATARA CREEK WATERSHED

By Mike Snyder, NRCS

In 2019, a partnership with the Pennsylvania American Water Company (PAWC) and NRCS was awarded a National Water Quality Initiative project covering the Dauphin and Lebanon County portions of the Swatara Creek Watershed. This source water protection initiative prioritizes the implementation of conservation practices on agricultural operations which comprise nearly 50 percent of the 264 square mile watershed that contributes to the Hershey/ Palmyra Municipal Water Supply. Over 60 percent of streams in this watershed are designated as being impaired by agriculture according to the Pennsylvania Department of Environmental Protection. Water quality data is collected and analyzed for changes in turbidity measured at the PAWC intakes on the lower Swatara and Manada Creeks.

As the installation of conservation practices ramps up in the second year of implementation, NRCS is seeing successful projects on the landscape that have great potential to reduce both sediment and nutrient delivery to surface waters. Focusing on reducing erosion, which would most dramatically impact turbidity, NRCS has tackled several examples of remedying gully erosion in cropland. In FY21, 4.3 acres of grassed waterways were installed along with their supporting practices such as diversions, terraces, and subsurface drains. These grassed waterways alone can be attributed to correcting an estimated 265 tons of historical erosion that was delivered to surface water.

In addition to sediment pollution in the watershed, nutrients remain a significant challenge as well for water suppliers. The need to upgrade waste management systems and improve livestock management are costly investments for many agricultural producers given today's markets. This year NRCS has invested in excess of $500,000 to address nutrient delivery to ground and surface water through the installation of five waste storage facilities, two roofs, 6,400 square feet of concrete heavy use areas, two waste transfer systems, and over 500 acres of nutrient management implementation.

Grassed waterways, along with supporting practices, were installed to correct an estimated 265 tons of historical erosion that was delivered to surface water in the Swatara Creek Watershed.

There is plenty of more work to be done. Ten new contracts were approved for over $800,000 treating resource concerns on more than 1,000 acres in this fiscal year. 1,700 feet of terraces/diversions, 1.9 acres of grassed waterways, 19 waste storage facilities, 17 roofs, 22,000 square feet of concrete heavy use areas, 255 acres of cover crops, 125 acres of prescribed grazing, 1,000 acres of nutrient management implementation, and more are planned in the upcoming year with the hope of seeing tangible water quality benefits for source water protection.

DAM REHABILITATION

PENNSYLVANIA DAM REHAB PROGRAM

In the 1960's through the 1980's, NRCS assisted with the design and construction of over 80 flood control dams across Pennsylvania. These dams currently protect the homes and public infrastructure below them. Since their construction, the dams have held detained millions of gallons of runoff that would otherwise contribute to downstream flooding. While built to be state-of-the-art at the time, rainfall amounts and dam safety criteria have changed since the construction of the dams. Many of these structures are over 50 years old and have reached the end of their project life. Some were originally built as Significant Hazard dams and have now been reclassified as High Hazard.

In 2012, Pennsylvania was selected as one of 12 states to engage in the PL-566 Watershed Protection and Flood Prevention Act Rehabilitation program. Pennsylvania NRCS has been diligently working with eight sponsors in the national effort to rehabilitate their dams, ensuring that flood control dams built under the PL-566 program are safe and meet current dam design criteria. An initial funding of over $11 million helped start the process of doing initial dam assessments on all of the high-hazard potential sites, planning on fifteen sites, design on nine sites, and construction on three sites.

In FY 2021, twenty-two site walks of the dams were completed. One dam is ready for construction, with sponsor funding becoming available. Design work is in progress on four rehabilitations with an additional design awaiting permits. One Plan, which includes four dams within the same watershed, is in progress and is to be completed early next year. Sixteen dam assessments were completed.

In addition to the Watershed Rehabilitation Program, NRCS is working through the planning process for four projects in Chester, Lancaster, Westmoreland, and Wyoming Counties. These projects are focused on addressing land treatment and flood protection within the watershed and are funded through the Watershed and Flood Prevention Operations.

Roller-Compacted Concrete placement of auxiliary spillway cutoff, Brandywine Creek PA-433, Beaver Creek Dam

BEAVER CREEK DAM BEGINS CONSTRUCTION

In FY2021, construction began for the rehabilitation of Brandywine Creek PA-433 Beaver Creek Dam in Chester County. (Beaver Creek's sister, Hibernia Dam was rehabilitated in FY2020). Beaver Creek Dam provides tremendous benefits to the community including flood control, improved water quality through sediment and erosion control, and incidental wildlife habitat. Working with the project sponsor, Chester County Water Resources Authority, NRCS has constructed a roller-compacted concrete cutoff in the auxiliary spillway, a trench drain below the downstream slope, drainage cleanout improvements, and is currently replacing the riser structure. These structural repairs will increase the integrity of the dam and significantly lower any risks to public safety and health.

The engineering work was done using engineering firms selected from the National IDIQ (Indefinite Delivery Indefinite Quantity) process. PA NRCS engineering staff negotiated and hired several private engineering firms to do the planning, design, and construction quality control. PA NRCS engineering, its National Water Management Center (NWMC) and its National Design, Construction, and Soil Mechanics Center (NDCSMC) staff reviewed and commented on all the work in the various phases and were also involved with working with state regulators and keeping the sponsors involved and informed.

TABLE 3: WATERSHED REHAB ACCOMPLISHMENTS FOR FY 2021

Dam	Watershed	County	Sponsor	Milestone Achieved	Anticipated Construction
Conneautville Dam	Conneautville	Crawford	Borough of Conneautville	Design Completed	2022
Beaver Creek Dam	Brandywine Creek	Chester	Chester County Water Resource Authority	Construction Underway	2021-2022
Kintz Creek Dam	Greene Dreher	Pike	Pike County	Design in Permitting	2023
Beechwood Dam	Mill Creek	Tioga	PA Fish and Boat Commission	Design Underway	2024
Rainbow Dam	Mill Run	Crawford	City of Meadville	Design Underway	2026
Hamilton Dam	Marsh Creek	Tioga	Wellsboro Borough	Design Underway	2024
Core Creek Dam	Neshaminy Creek	Bucks	Bucks County	Design Underway	2025
Martin, Varcoe, Finkleday & Garret Dams	Lackawaxen Tributaries	Wayne	Wayne County	Watershed Plan Underway	2026+

Conservation Innovation Grants

In Fiscal Year 2021, two Conservation Innovation Grant proposals focusing on soil health were funded, totaling $131,888. The American Farmland Trust's project, Women for the Land: Helping Women Farmers and Landowners Advance Soil Health in Pennsylvania provides direct education on soil health management equipment and use, including a no-till vegetable transplanter, roller crimper, and no-till drill to women farmers. The Rodale Institute received a grant for Growing Industrial Hemp as a Multipurpose Crop in PA Organic Cropping Systems. A two-year field trial will be conducted to demonstrate using leguminous cover crop to grow hemp in rotation with malting barley, reducing nitrogen loss and building soil health.

Additionally, the following Pennsylvania CIG agreements concluded this year.

Alliance for the Chesapeake Bay: Dairy-led Healthy Streams Initiative: A Lancaster County Demonstration (funded in 2018) - In January 2018, Turkey Hill Dairy began requiring that all farmers serving the dairy obtain and implement all necessary practices in their conservation plan. Following this, the Turkey Hill Clean Water Partnership, consisting of Turkey Hill, the Alliance for the Chesapeake Bay, and the Maryland & Virginia Milk Producers Cooperative, was formed to guide and serve their farmers. To date, they have received $10 Million in support from NRCS and National Fish and Wildlife Foundation and additional sources to write conservation and nutrient management plans for 96 percent of the cooperators.

Through their CIG agreement, the Alliance developed a stream riparian buffer gap analysis and buffer establishment prioritization. They used geospatial data to prioritize sites in the Pequea, Conestoga, and Octoraro Watershed in Lancaster County. Prior to activating, the new Partnership assessed resource concerns and conservation practices (both needed and implemented) on producers' farms. They developed marketing messages to drive consumer interest in dairy products sourced from stream-conscious dairies. The Partnership has seen good press coverage advocating for adaptation and replication of this model. They were able to demonstrate success of market-based incentivization by showing an increase in producer willingness to adopt a conservation standard that includes riparian forested buffers, complete livestock exclusion, adequate manure storage facilities, and stabilized heavy use areas. In addition, a technical guide, fact sheet, and presentation were developed.

This CIG spawned a project application from the Alliance for the Chesapeake Bay for the Regional Conservation Partnership Program (RCPP) to institute these innovative strategies. The resulting RCPP project was awarded $4 million in NRCS funding with partners providing $5.7 million to finance agricultural conservation practices with these MD and VA Milk Producer Cooperators. This project will expand the technical and financial assistance available to develop and implement comprehensive nutrient management plans on livestock operations to reduce nutrient and sediment runoff into PA waters in the Chesapeake Bay Watershed.

American Farmland Trust: Women Landowners for Conservation and Water Quality in Pennsylvania (funded in 2018) - This project targeted women landowners and operators in Adams, Dauphin, Lebanon, Perry, and York Counties. American Farmland Trust (AFT) used their Conservation Learning Circles to assist women in realizing their conservation vision for their land by providing information on government conservation programs and technical and financial assistance and introducing them to local conservation professionals, such as other women. This was to spur the creation of local support networks, educating them about benefits (economic and environmental) of conservation practices and how to install them on the land, and empowering them in their relationships with tenant farmers so they may confidently express desires related to how their land should be managed. AFT collaborated with the Chesapeake Bay Conservancy to create a Women for the Land Module which

generated site-specific GIS restoration analysis for the participants. AFT used funds from other sources to survey landowners that do not farm to understand landowners and remove barriers.

Some challenges were encountered as the project shifted from in-person to a virtual format during the COVID-19 Pandemic, but this project was successful regardless. To support the virtual model, they created professionally made farm tour videos which were invaluable to the participants as they learned that others faced similar challenges. Participants reported increased confidence in knowing regenerative ag approaches, seeking assistance from a conservation professional, knowing technical and financial assistance opportunities, describing farm objectives, and discussing land protection with partners. After the program, participants indicated the following on a survey.

- 33% are very likely to apply for a USDA conservation program
- 66% are likely/very likely to contact a service provider that they met during the learning circle
- 66% are very likely to obtain additional information on protecting their land
- 66% are very likely to start working toward protecting their land
- 50% are very likely to adopt a new conservation practice on their land with or without government assistance.

The Pennsylvania State University: Retrofitting the Roadside Ditch Network to Treat Nitrogen from Agricultural Runoff using Woodchip Bioreactors in Bradford County, PA (funded in 2018) – In 2018, the Pennsylvania State University, PA State Conservation Commission, Cornell University, and the Bradford County Conservation District demonstrated a new way to treat nitrogen in agricultural runoff at the field edge. The project used rural road ditches to install low-cost filtration systems, retrofitting these ditches with woodchip bioreactors to remove nitrogen. The partners examined the effectiveness relative to temporal and environmental changes. Results show that removal efficiency over the two-year monitoring period ranged from 0 percent up to 100 percent and averaged approximately 30 percent, with greatest removal under low flow conditions. These findings support this method as an option to buried systems. A request will be made to incorporate this in the National Conservation Practice standard 605, Denitrifying Bioreactor.

Water Science Institute: Legacy Sediment 2.0: Enhanced Mapping and Decision Support Tool (funded in 2018) – Legacy sediment from post-European settlement farming, milling, and forestry practices has become a commonly recognized source of water quality impairments. This CIG agreement focused on developing additional information for erosion identification and conservation targeting metrics for the following six counties: Adams – Plum Creek Watershed, Cumberland – Mountain Creek Watershed, Dauphin – Paxton Creek Watershed, Franklin – Back Creek Watershed, Lebanon – Little Swatara Watershed, York – Lower South Branch – Codorus Creek Watershed. Through the project, a story map entitled Legacy Sediment 2.0: Enhanced Mapping and Decision Support Tool was produced. It took four years of intensive research and data organization to create this approach to planning which incorporated the effects of mill dams and other impairments on local watersheds in the lower Susquehanna and Potomac watersheds. Data layers allow for the identification of mill dams, legacy sediment terraces, erosion rate and volume metrics, custom code to create enhanced stream centerlines that capture higher resolution hydrologic networks, block 'hotspot' identification, parcel data, and canopy layers to assist in developing specific restoration strategies. Additional layers may be imported (such as wetlands, topographic, orthographic images) from other public data sets.

The data layers are used to inform decision making for the next steps in several impaired streams within watersheds in south-central PA. The Chiques Creek, NRCS's PL-566 Project, is one of many projects using this new CIG technology.

Sustainable Chesapeake: Reducing air emissions from on-farm poultry litter-fueled energy systems (funded in 2018) - This project's objectives were to reduce particulate matter air by 70 percent and expand markets for poultry litter co-products. OrganiLock and Triple Green Energy Products Cyclonic Filter Systems were evaluated. The following considerations for farmers were developed. The systems have potential, but on-farm systems do require considerable time and resources. Both farms evaluated used a single-flock bedding system. Analysis of fuel value for the individual farm is needed and farmers will need to determine if their litter meets EPA boiler requirements. Financial feasibility will be based on availability and cost of litter and propane. More research is needed to determine where and when propane or poultry litter is a better fuel source. At this time, additional data and cost information is needed for us to incorporate into our practice standards and cost list.

OUTREACH AND TRAINING

PA CIVIL RIGHTS

In FY21 the Pennsylvania Civil Rights Advisory Committee (CRAC) held virtual quarterly meetings. Outreach activities were a combination of virtual and in person this year. The new Customer Engagement Tool for reporting was improved and a youth tracker was developed to assist field teams with tracking youth engagement and events.

The CRAC and special Emphasis Program Managers (SEPM's) have continued to participate during the hiring and interviewing process to make sure all applicants have equal opportunity and are treated fairly. Additionally, the CRAC committee welcomed and provided resources to new hires.

Presentations were provided during the statewide teleconference throughout the year including a Veteran's Day presentation, Hispanic Heritage Month, and History of National Disability Month. Multiple Civil Rights write-ups were provided for the employee Newsletter. An AgrAbility representative was secured to speak at the Statewide Conservation Planning Training meeting about effectively working with producers with disabilities and the AgrAbility Program. The CRAC committee provided a letter of support to PA-AgrAbility and the PA Veteran Farming Project for grant funding. The CRAC also assisted producers in applying for AgrAbility assistance. A virtual Hispanic Heritage Month event was hosted where a special guest from Puerto Rico joined to discuss her farm and experiences working with NRCS. A PB&J Luncheon was also hosted.

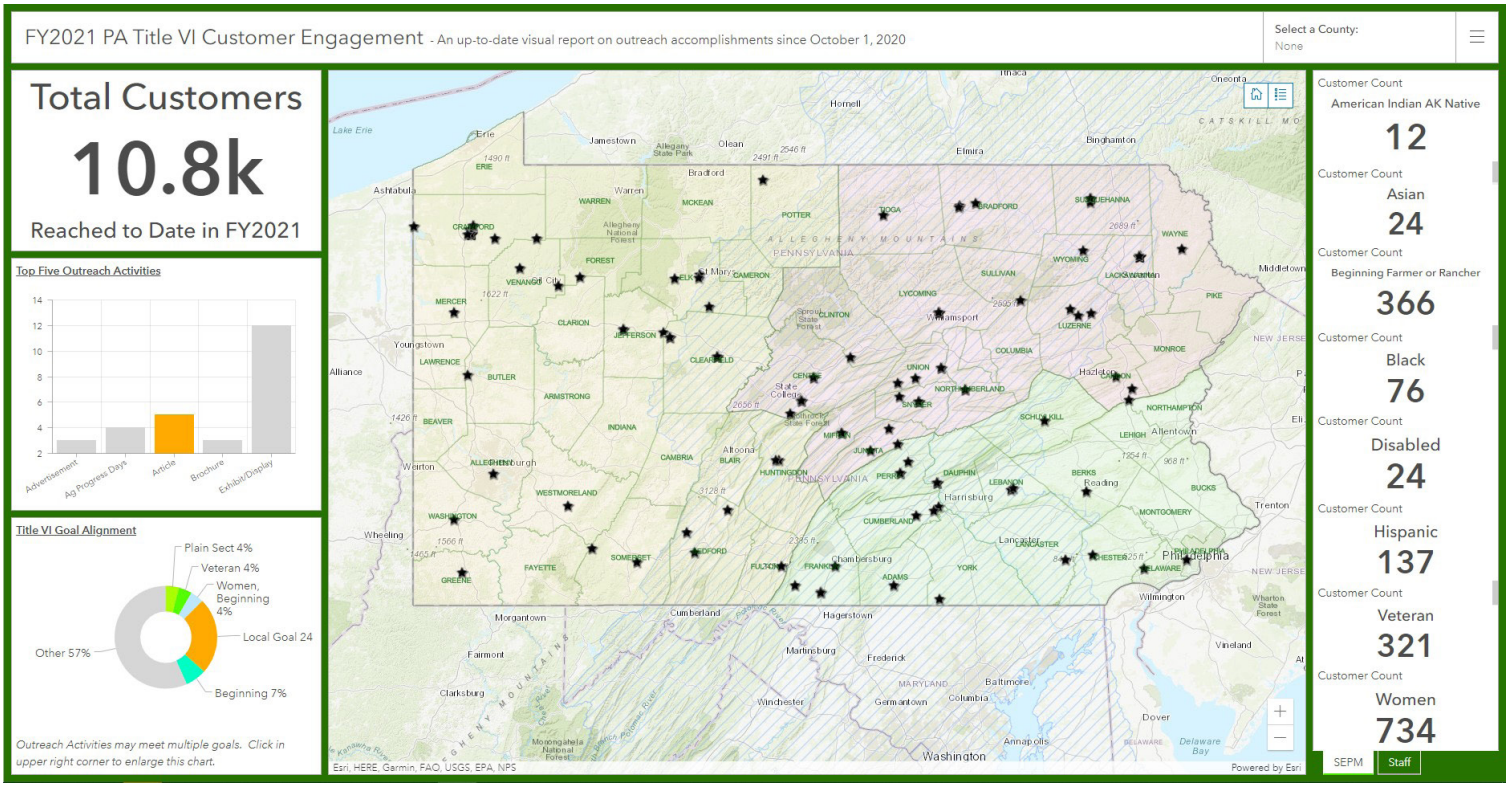
SEPM's participated in meetings and conferences including the National SEPM for Disabilities quarterly meeting, Workgroup for Education Outreach for Historically Underserved Customers, All-Employee Civil Rights Meeting, Lebanon County Virtual Learning Circle, National Veteran SEPM Quarterly meeting, and Harrisburg Urban Agriculture Open House. SEPM's hosted or participated in multiple outreach field days.

Title VII outreach to employees and potential employees included sharing upcoming pathways and job announcements with the PA Veteran Farming Project, Rodale Institute's Veteran Farmer Training Program, Delaware Valley, Penn State, and PASA Sustainable Agriculture. Scholarship information was provided to American Indian/Alaska Natives.

CUSTOMER ENGAGEMENT DASHBOARD

Beginning in FY21, Field Teams across the state utilized a new tool to record outreach activities. The Title VI Customer Engagement Tracking Tool is a simple-to-use web form and smartphone app, and staff quickly and easily log activities as they occur. The Tracking Tool synchronously displays data on the Title VI Customer Engagement Dashboard. Now field teams, supervisors, coordinators, outreach staff, and leadership can see overall progress at a glance or zoom in for detailed local reports.

Notably in FY21, there were at least 69 outreach activities in the Chesapeake Bay Watershed, 2,364 Historically Underserved Customers reached, and approximately 10,644 total customers reached. Additional information is summarized for the full year in the Dashboard screenshot on the next page.

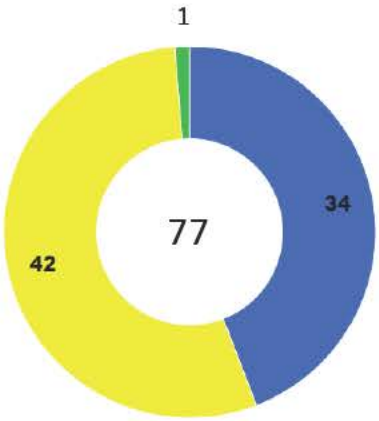


The Customer Engagement Dashboard is used by Field Teams across Pennsylvania to easily log outreach activities.

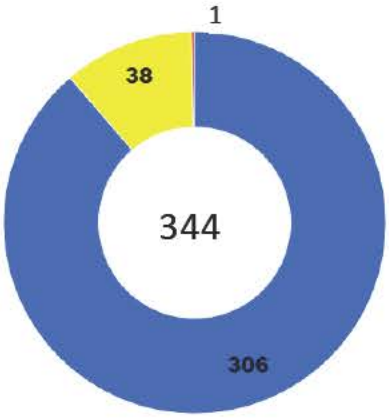
TRAINING

PA NRCS continues to place a large emphasis on training its own employees as well as those of the conservation partnership. In FY 2021, PA NRCS hosted 29 trainings. The charts below provide a breakdown of those in attendance.

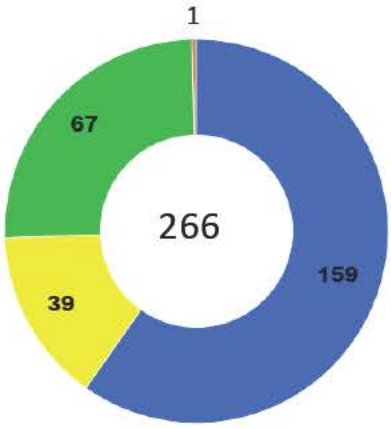
BOOT CAMP TRAININGS (BASIC AND ADVANCED)



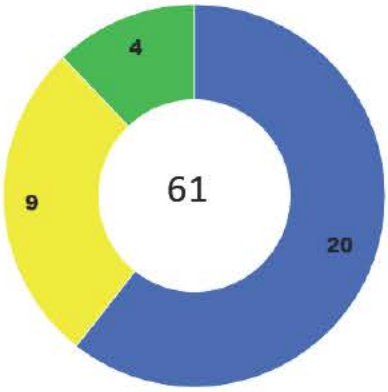
AREA & FIELD OFFICE ENGINEERING TRAINING



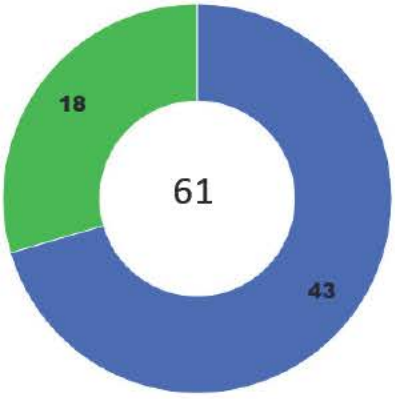
STATEWIDE OFFICE TRAININGS

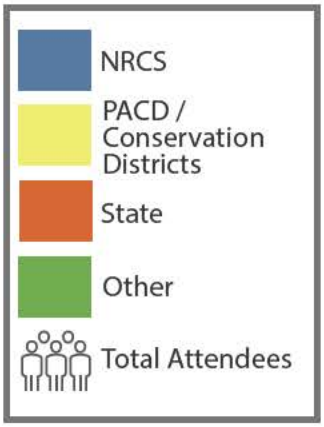


CULTURAL RESOURCES



CNMP TSP UPDATE





PARTNERSHIP HIGHLIGHTS

In FY 2021, PA NRCS administered eight different technical support agreements that provided additional staff to work on NRCS conservation activities in Pennsylvania. Through these agreements over 50 affiliates contributed additional staffing valued at more than $2 million. These agreements were with partner entities including five Resource Conservation and Development Councils (RC&Ds), Pheasants Forever, the National Older Workers Career Center, and the Chesapeake Bay Foundation. The affiliate employees conducted conservation planning and provided technical assistance, program support, and administrative support for PA NRCS offices.

NRCS also held an agreement with the Pennsylvania Association of Conservation Districts (PACD) to provide services for three different activities: conservation district staff support, engineering technical services, and training. The first activity provided conservation district staff support to NRCS from 10 different conservation districts for 17 full or part-time people (10+ full-time equivalents). NRCS cost-shared these employees and provided 75% of the salaries and benefits for these conservation district employees. The other 25% was provided by the conservation districts. The work that was completed under the PACD agreement by these full-time equivalent conservation district employees is summarized in Table 4.

Two other activities under the same PACD agreement included engineering technical assistance and conservation training. The engineering technical assistance portion of the PACD agreement included funding for seven staff positions that were cost-shared between NRCS and the PA Department of Environmental Protection to provide engineering technical assistance to conservation districts and Growing Greener Grant recipients. The other activity funded under the PACD agreement was conservation training. This activity, described elsewhere in this report, was cost-shared between the Pennsylvania State Conservation Commission and NRCS. Funding and examples of work performed for all three activities under the PACD agreement is shown in Table 5.

TABLE 4: PACD AGREEMENT FY 2021 ACCOMPLISHMENTS

Components	Number	Hours
Conservation Plans	41	4,905
Inventory and Evaluation	45	344
Surveys	80	1,007
Practice Design/ Layout	178	3,289
Construction Quality Assurance	67	1,544
Practice Check-outs	145	481
Total:	**556**	**11,569**

Contributor	Funding
Conservation Districts	$180,967
NRCS	$542,902
Total Contribution	**$723,870**

CERULEAN WARBLER APPALACHIAN FORESTLAND ENHANCEMENT RCPP COMPLETED

NRCS and partners have completed a successful project through the Regional Conservation Partnership Program (RCPP) to enhance forest habitat for Cerulean Warblers on private lands in cooperation with the Appalachian Mountain Joint Venture (AMJV). The RCPP Cerulean Warbler Appalachian Forestland Enhancement project was available from FY 2015 through FY 2020 and has provided technical and financial assistance to forest landowners in Pennsylvania as well as in West Virginia, Maryland, Ohio and Kentucky. The project was officially completed in FY 2021. RCPP empowers local leaders to work with a variety of partners to design conservation solutions that work best for their regions.

The Cerulean Warbler is a migratory songbird that breeds in mature deciduous forests in eastern North America. The loss of structurally complex forests has contributed to an average decline of 3.02 percent per year of Cerulean Warblers in the Appalachians from 1966-2012, making it one of the steepest rates of decline of all North American warblers. The U.S. Fish and Wildlife Service (USFWS) has designated the Cerulean Warbler as a species of national conservation concern.

Forest management projects to improve Cerulean Warbler habitat included thinning the forest by removing low-quality trees and controlling undesirable or invasive plants on the forest floor. Forestry management practices were contracted to enhance Cerulean Warbler habitat which have also improved forest regeneration, tree growth rates, and acorn production in oaks. The increased food and cover also provided better habitat for many other forest dwelling species. The result of the RCPP project has been an expansion of Appalachian breeding habitat and the promotion of contiguous areas of viable working forests to help ensure long-term conservation of Cerulean Warblers.

The Cerulean Warbler is a migratory songbird that breeds in mature deciduous forests in eastern North America.

Through the 5-year RCPP project NRCS saw a total obligation in PA of $3,314,677 on 139 individual PA private forestland projects. This resulted in a total of 6,192 project acres in PA which were improved for Cerulean Warbler habitat. In addition to the habitat projects, AMJV and NRCS partnered with several other organizations and agencies to host landowner workshops, forestry consultant workshops, and a congressional tour with PA Congressman G.T. Thompson.

The cooperation between NRCS staff and AMJV partners resulted in enormous benefits for PA and other Appalachian region forest landowners. NRCS PA continues to encourage cooperation with partners through the RCPP program.

PARTNERSHIP HIGHLIGHTS

PA NRCS was also provided funding for the Voluntary Public Access-Habitat Incentives Program (VPA-HIP) program agreement in July 2020. This agreement is with the Pennsylvania Fish and Boat Commission (PFBC) and will provide more than $668,000 in funding for habitat improvement and the purchase of permanent easements from private landowners to provide miles of water frontage for public fishing access.

NRCS also supports two on-going interagency agreements with other Federal agencies. One agreement is with the US Fish and Wildlife Service (FWS) to provide wildlife expertise and services for bog turtle conservation and protection, and for the promotion and conservation of pollinator species. The other interagency agreement is with the US Geological Survey (USGS) to provide near real-time water-quality monitoring and modeling of conservation practices in the Chiques Creek Watershed in Lancaster County, Pennsylvania.

TABLE 5: PACD AGREEMENT ACTIVITIES

Activity: District Employee Support			Activity: Engineering Support			Activity: Training		
NRCS Funding	District Funding	Total Funding	NRCS Funding	DEP Funding	Total Funding	NRCS Funding	SCC Funding	Total Funding
$597,371	$181,022	$778,393	$92,267	$92,267	$184,534	$17,313	$1,656	$18,969

REGIONAL CONSERVATION PARTNERSHIP PROGRAM

At the beginning of FY 2021 PA NRCS had four active RCPP Agreements. FY2021 was the first year of RCPP projects funded with the revised RCPP under the 2018 Farm Bill. During FY2021 PA NRCS was awarded seven new RCPP projects. Of these seven new RCPP Projects, five were under agreement by the end of FY 2021. Two projects were still under negotiation.

The five new RCPP projects with agreements completed are shown below in Table 6.

TABLE 6: NEW RCPP PROJECTS IN FY21

RCPP Project	NRCS Funding	Partner Funding
1. ***Kittatinny Ridge Conservation Landscape*** Lead Partner: Pennsylvania Department of Agriculture	$9,928,571	$38,982,500
2. ***Ag BMP Implementation in the Chesapeake Bay Watershed*** Lead Partner: Berks County Conservation District	$2,232,143	$2,294,875
3. ***Buffalo Creek Watershed Conservation Alliance*** Lead Partner: Audubon Society of Western Pennsylvania	$1,169,618	$1,163,815
4. ***Lancaster's Common Agenda for Clean Water*** Lead Partner: Conservation Foundation of Lancaster County	$7,400,000	$13,244,890
5. ***Turkey Hill Clean Water Partnership*** Lead Partner: Alliance for the Chesapeake Bay	$4,000,000	$5,707,993