



DELAWARE WATERSHED STREAM CORRIDOR MANAGEMENT PROGRAM

East and West Branch of the Delaware River 2022-2024 Action Plan



Steele Brook SL 4.52 Streambank Stabilization at Phase I, Village of Delhi, NY constructed in 2021

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Introduction:

A comprehensive Stream Corridor Management Plan (SCMP) for the West Branch Delaware River was completed in 2005 and the East Branch Delaware River (EBDR) was completed in December 2007 by the Delaware County Soil & Water Conservation District (DCSWCD) Stream Corridor Management Program, Department of Environmental Protection (DEP), and Delaware County Planning Department (DCPD). Since their adoption, DCSWCD in partnership with DCPD and DEP have been implementing the 36 recommendations contained in the two plans following priorities established in the Action Plan for each basin. This Action Plan combines the previously separate Action Plans for each basin into one Action Plan for the entire upper Delaware Watershed within the New York City water supply watershed.

During the development of the West and East Branch Delaware River SCMPs, a Project Advisory Committee (PAC) was formed to represent the interests of local officials, residents, businesses, and agencies living and working in the Cannonsville and Pepacton Reservoir watersheds. The PAC assisted in the preparation of the SCMP recommendations and is now working collaboratively to guide the Stream Corridor Management Program (SCMP) in the implementation of the recommendations.

In the implementation of the SCMPs, the PAC consists of all supervisors, mayors or their designated representatives. The PAC members have been instrumental in the development of program rules and selection of projects to be funded. In addition, the PAC has provided guidance to this SWCD as we move forward in our Flood Hazard Mitigation program.

The implementation of the recommendations shall be accomplished through the following program elements:

- ❖ Delaware Watershed Stream Management Implementation Program Grant (SMIP)
- ❖ Local Flood Hazard Mitigation Program (LFHMP)
- ❖ Catskill Stream Buffer Initiative (CSBI) Funding
- ❖ Restoration Project Funding
- ❖ Conservation Reserve Enhancement Program (CREP) Assistance
- ❖ Stream Corridor Management Program Technical Assistance and General Support

In 2022-2024, some action items within the Delaware Action Plan may be impacted by the COVID-19 policies and guidelines. Delaware County SWCD will continue to follow the guidance from New York State, the US Federal government, local county government, and the Delaware County Soil and Water Conservation District's policies to stop the spread of the COVID-19 virus.

1. Delaware Watershed Stream Management Implementation Program Grant (SMIP)

The Delaware Watershed Stream Management Implementation Program (SMIP) grants, established in 2010, fund eligible stream and floodplain water quality protection construction projects and programs that advance the Stream Management Plan recommendations for municipalities that have adopted the Stream Corridor Management Plan and signed a Memorandum of Agreement with the Delaware County Soil and Water Conservation District.

The SMIP grant funds are typically offered through an annual application process with grants targeted to fulfill the SCMP priorities and the recommendations of the stream management plans. The following section reviews the proposed Action Items related to the administrative aspects of the SMIP.

A. SMIP Administrative Action Items

- 1. Update the grant application, review and award process for SMIP. (SCMP Staff, DEP, PAC)**
 - **Schedule SMIP grant round 2021**
 - i. Pre-applications: March 1, 2021. Received 24 applications**
 - ii. Site Visits: April 16, 23 and 28, 2021**
 - iii. Formal applications: July 9, 2021. Received 17 applications**
 - iv. Scoring committee: September 24, 2021**
 - v. Project Advisory Committee (PAC) members met on March 24, 2022 and recommended to combine all existing SMIP projects with the current SMIP grants applications and implement the projects until all funding has been expended in the current Stream Program's DEL-436 contract with NYC DEP. Any projects that are unable to be funded will be placed on a contingent list and will be monitored for any changes while in search for outside funding.**
 - vi. Continue to implement awarded projects in 2022-2024.**
 - **Continue an open enrollment for Local Flood Analysis-generated projects**
- 2. Maintain information on the status of awarded grants and future grant rounds through the Catskillstreams.org website. (SCMP Staff, DEP)**
- 3. Regularly prepare and distribute press releases on the accomplishments of the recipients of SMIP grants. (SCMP Staff, grant recipients)**
- 4. Expand the scope of the SMIP grant funding to support flood hazard mitigation projects identified through the Local Flood Analysis (LFA) under the Local Flood Mitigation Program (LFHMP).**
- 5. Create opportunities for the delegation of project design tasks to grant recipients, their consultants or consultants to DCSWCD.**

2022-2024 SMIP grants are listed below:

Recreation and Habitat Improvements						
<u>Project Title</u>	<u>Applicant</u>	<u>Project Description</u>	<u>Length (feet)</u>	<u>Scheduled for Completion</u>	<u>Funding Awarded</u>	<u>Status</u>
Arkville Recreational Trail	Water Discovery Center	Construction of trail along East Branch Delaware River	---	December 2023	\$130,350	Pending SMIP contract

Highway/Infrastructure Stream Channel / Stream Bank Stabilization						
<u>Project Title</u>	<u>Applicant</u>	<u>Project Description</u>	<u>Length (feet)</u>	<u>Scheduled for Completion</u>	<u>Funding Awarded</u>	<u>Status</u>
Pines Brook Streambed Stabilization	Town of Walton	Streambed stabilization with grade control	600	Monitor Only	---	Installed Monitor cross sections 2020
Tributary Grade Control Structures	Village of Walton	Utility Crossing #6: West Brook at East St. Bridge	150	June 15, 2022-September 30, 2022	\$51,950	Partially constructed but postponed due to high water in 2021
Tributary Grade Control Structures	Village of Walton	Utility Crossing Sites #8: West Brook-Delaware St. Bridge	90	December 2022	\$60,000	60% Design
West Brook Streambank Stabilization at Village Well	Village of Walton	Bank Protection at Village Well	200	December 2022	\$137,929	Pending SMIP contract. Survey in summer 2022
West Branch Bank Stabilization at Fair Grounds	Village of Walton	Streambank restoration on steep embankment	250	December 2022	\$289,333	Pending SMIP contract. Additional Survey 2022
Coles Clove Streambank Repair & Reinforcement	Town of Hamden	Repair road shoulder	90	December 2022	\$141,400	Pending SMIP contract. Survey in spring 2022
Little Red Kill Streambank Stabilization	Town of Middletown	Streambank Stabilization along road embankment		December 2023	\$236,000	Pending SMIP contract. Survey in summer 2022
Dingle Hill Stream Restoration	Town of Andes	Streambank restoration on steep embankment	150	December 2023	\$114,500	Pending SMIP contract. Survey in summer 2022
Hamden Hill Road Stream Restoration	Town of Delhi	Culvert replacement and repair of streambank along road embankment	600	December 2023	\$260,000	Pending SMIP contract. Survey in summer 2022
Dryden Brook Bank Reinforcement	Town of Tompkins	Streambank restoration on steep embankment		December 2023	\$73,900	Pending SMIP contract. Survey in summer 2022

Planning and Assessment						
<u>Project Title</u>	<u>Applicant</u>	<u>Project Description</u>	<u>Length (feet)</u>	<u>Scheduled for Completion</u>	<u>Funding Awarded</u>	<u>Status</u>
Carrol Hill Culvert Replacement	Town of Tompkins	Engineer design for culvert replacement	--	2022-2023	\$30,000	Design in Progress with DCDPW
John Tuttle Culvert Replacement	Town of Middletown	Engineer design for culvert replacement	--	2022-2023	\$30,000	Design in Progress with DCDPW

Structure Replacement / Consultant Projects						
<u>Project Title</u>	<u>Applicant</u>	<u>Project Description</u>	<u>Length (feet)</u>	<u>Scheduled for Completion</u>	<u>Funding Awarded</u>	<u>Status</u>
Steele Brook Bridge Redesign at Woolerton St.	Village of Delhi	Design only for the replacement of the bridge	---	December 2023	\$100,000	Pending SMIP contract.
Chambers Hollow Restoration & Culvert Replacement	Town of Hamden	Replacement of culvert and stream channel restoration	260	December 2024	\$431,200	Pending SMIP contract
Crystal Creek Culvert Replacement	Town of Hamden	Replacement of deteriorated culvert and headwall failure	70	December 2024	\$300,000	Pending SMIP contract
State Road Bridge Replacement	Town of Andes	Replacement of Timber Bridge with headwall failure	80	December 2024	\$400,270	Pending SMIP contract

Debris Removal						
<u>Project Title</u>	<u>Applicant</u>	<u>Project Description</u>	<u>Length (feet)</u>	<u>Scheduled for Completion</u>	<u>Funding Awarded</u>	<u>Status</u>
Mill Brook Road Debris Removal	Town of Hardenburgh	Remove trees that could mobilize and plug bridge downstream		On Hold	\$100,000	Pending DEP Approval
Binnekill Stream Debris Removal	Village of Margaretville	Remove trees and debris from the Binnekill to enhance stream channel capacity		On Hold	\$38,200	Pending DEP Approval

Equipment						
<u>Project Title</u>	<u>Applicant</u>	<u>Project Description</u>	<u>Length (feet)</u>	<u>Scheduled for Completion</u>	<u>Funding Awarded</u>	<u>Status</u>
De-Watering pumps & equipment	Town of Walton	Purchase pumps and hoses	---	December 2022	\$5,056	Pending SMIP contract. Purchase scheduled 2022
Pump to Aide Culvert replacement	Town of Bovina	Purchase pumps and hoses	---	December 2022	\$1,959	Pending SMIP contract. Purchase scheduled 2022

Restoration Projects

<u>Project Title</u>	<u>Applicant</u>	<u>Project Description</u>	<u>Length (feet)</u>	<u>Scheduled for Completion</u>	<u>NYS DOH FAD Deliverable</u>	<u>Funding Awarded</u>	<u>Status</u>
Bull Run Bank Stabilization	Town of Middletown	Hill slope super saturated during spring thaw adding turbidity to stream channel	170	On Hold	Yes	\$360,000 (WRDA grant with 25% local cost share)	60% Design
Birdsong Farm WBDR Restoration Project	Town of Delhi	Restoration bank stabilization	1,200	2023	Yes	\$1,500,000	30% Design
River Haven Farm – WBDR Restoration	Town of Hamden	Restoration bank stabilization	2,600	2023	Yes	\$1,500,000	30% Design

Flood Hazard Mitigation Projects

<u>Project Title</u>	<u>Applicant</u>	<u>Project Description</u>	<u>Length (feet)</u>	<u>Scheduled for Completion</u>	<u>Funding Awarded</u>	<u>Status</u>
Pleasant Valley Brook / EBDR Confluence Debris	Town of Roxbury	Debris removal & minor channel shaping/dimensioning on Pleasant Valley Brook at the EBDR confluence	100	December 2022	\$10,000	Pending SMIP Contract
Maple Avenue – Culvert Replacement	Village of Hobart	Replace undersized culvert on Grant Brook	110	December 2022	\$300,000	Pending SMIP Contract Consultant to design
Andes Central School Stream Corridor Restoration	Town of Andes / Andes Central School	Upper portion on Liddle Brook stream bed and wall restoration	317	December 2022	\$400,000	60% Design
Price Chopper Berm Removal	Village of Delhi	Remove berm and re-establish floodplain connectivity	100	December 2023	\$160,000	Pending SMIP Contract
Village of Stamford South Street Culvert Replacement	Village of Stamford	Replace partially collapsed arch bridge structure that spans WBDR	100	December 2023	\$550,000	Surveyed Consultant to design
Andes Central School Stream Corridor Restoration	Town of Andes / Andes Central School	Liddle Brook/Tremper Kill Floodplain bench, wall restoration, bridge replacement and stream bed repair	606	December 2023	\$400,000	30% Design
Breakey Motors Floodplain Reclamation project – Design only	Town of Walton	Floodplain reclamation design after the purchase and demolition of Breakey Motors building	---	---	Moved to CWC Project	All Data has been shared with CWC
Elk Creek Road – Toe Cut Problem	Town of Halcott	Streambank restoration to protect road embankment	270	December 2024	\$300,000	Pending SMIP Contract
Vega Mountain Road Tributary – Culvert Replacement – Phase I	Town of Roxbury	Replace undersized culvert on Vega Mtn. Road	70	December 2024	\$400,000	Pending SMIP Contract Consultant to design

Flood Hazard Mitigation Plans					
<u>Project Title</u>	<u>Applicant</u>	<u>Project Description</u>	<u>Length (feet)</u>	<u>Total Project Cost</u>	<u>Status</u>
Local Flood Hazard Mitigation Analysis	Town of Andes	LFA plan for the Tremper Kill			Pending
Local Flood Hazard Mitigation Analysis	Town of Bovina	LFA plan for three sites along the Little Delaware River			Pending
Local Flood Hazard Mitigation Analysis	Town of Kortright	LFA plan in the hamlet of Bloomville			Pending
Local Flood Hazard Mitigation Analysis	Town of Meredith	LFA plan in the hamlet of Meredith Square			Pending
Local Flood Hazard Mitigation Analysis	Town of Middletown	LFA plan in the hamlets of New Kingston, Dunraven, and Halcottsville			Pending
Local Flood Hazard Mitigation Analysis	Village of Margaretville	LFA plan in the village limits and extensions			Pending
Local Flood Hazard Mitigation Analysis	Town of Tompkins	LFA plan in the hamlet of Trout Creek			Pending

SMIP grants completed in 2021 are listed below:

Recreation and Habitat Improvements						
Project Title	Applicant	Project Description	Length (feet)	Total Project Cost	Year Awarded	Status
Arkville Recreational Hub Trail Master Plan	Water Discovery Center	Recreation trail along the East Branch Delaware River	---	\$2,250.00	2017	Completed 2021

Highway/Infrastructure						
Project Title	Applicant	Project Description	Length (feet)	Total Project Cost	Year Awarded	Status
Tributary Grade Control Structures	Village of Walton	Utility Crossing Site #4 West Brook at Austin Lincoln (North) to stabilize streambed from erosion at the utility crossings	150	\$55,626	2017	Completed 2021

Flood Hazard Mitigation Plans						
Project Title	Applicant	Project Description	Length (feet)	Total Project Cost	Year Awarded	Status
Local Flood Hazard Mitigation Analysis	Village of Stamford	LFA plan for the Villages of Stamford and Hobart, Hamlet of Kortright and Town of Stamford	---	\$134,750	2019	Completed April 2021

Flood Hazard Mitigation Projects						
Project Title	Applicant	Project Description	Length (feet)	Funding Awarded	Year Awarded	Status
Steele Brook Streambank Stabilization Phase I	Village of Delhi	Streambank stabilization on existing access route to Reservoir Park	125	Phase I \$211,985, Phase II \$181,218 (WRDA grant with 25% local cost share)	2018	Substantially Completed 2021
Steele Brook Streambank Stabilization Phase II	Village of Delhi	Streambank stabilization downstream of Phase I	250		2019	Substantially Completed 2021
Steele Brook Debris Removal	Village of Delhi	Tree removal within Steele Brook along 0.5 mile length to prevent downstream debris jams within the village	---	SMIP grant awarded \$20,000. Project was completed during Phase I	2017	Completed 2021

Other Stream Projects completed in 2021 are listed below:

Restoration Projects							
Project Title	Applicant	Project Description	Length (feet)	NYS DOH FAD Deliverable	Funding Awarded	Year Awarded	Status
East Brook CREP/CSBI Bank Stabilization	Landowner	Stream bank stabilization to facilitate CREP	740	No	\$234,300	2019	Substantially Completed 2021
West Brook SL 5.58 Bank Stabilization	Landowner	Stream bank stabilization to prevent water from access to agricultural fields	350	No	\$10,000	2021	Completed 2021

SMIP grant funds are offered to stakeholders to implement recommendations of the stream management plans and to further the evolving priorities of DCSWCD, DEP and the watershed communities. The following sections detail activities supported by the SMIP grant to implement plan recommendations.

Prioritization of Identified Stream Intervention Projects Action Items:

1. **Implement projects (example floodplain reclamation, bank stabilization, etc.) in collaboration with Municipalities. These projects will be identified in the Local Flood Analysis plans and in the East and West Branch Delaware River Stream Corridor Management Plans. (SCMPr Staff)**
 - a. **Pleasant Valley Brook / East Branch Delaware River Confluence Debris scheduled 2022**
 - b. **Maple Avenue Culvert Replacement scheduled for 2022**
 - c. **Andes Central School Stream Corridor Restoration Project scheduled for 2023**
 - d. **Price Chopper Berm Removal Project scheduled for 2023**
 - e. **Village of Stamford South Street Culvert Replacement scheduled for 2023.**
 - f. **Breakey Motors Floodplain Reclamation in the Village of Walton – has been transferred to Catskill Watershed Corp (CWC) project.**
 - g. **Elk Creek Road – Toe Cut Problem scheduled for 2024**
 - h. **Vega Mountain Road Culvert Replacement scheduled for 2024**
 - i. **Steele Brook Phase I and II Bank Stabilization (Delhi) completed in 2021.**

2. **Complete approved Delaware Watershed Stream Management Implementation Grant Program projects within the East and West Branch of the Delaware River watershed. A complete list of SMIP grants can be found on catskillstreams.org website. (SCMPr Staff and Sponsor)**

B. Enhance Recreation Opportunities Action Items:

1. **Provide technical assistance to communities to enhance streamside recreational opportunities. (DCPD, SCMPr staff, DEP)**
 - a. **East Branch Recreation Access Plan Recommended Projects:**
 - i. **Arkville Recreational Hub Trail Master Plan completed in 2021.**
 - ii. **Construction of the Arkville Recreation Hub Trail pending SMIP contract.**

2. **Continue to work with the East Branch flood commission, municipalities and stakeholder groups in the implementation of the East Branch Recreation Access Plan. (DCPD, SCMPr staff, DEP)**
 - a. **Participate with the Arkville Recreation Hub committee meetings as technical advisors in the development of Trail.**

3. **Continue to work with the West Branch flood commissions, municipalities and stakeholder groups on improving recreation access on the West Branch Delaware River (DCPD, SCMPr staff, DEP)**
 - a. **Beerston Boat Launch project on hold until the Town of Walton recommends to proceed with the project.**

4. **Continue to provide technical assistance to the flood commissions, municipalities and stakeholder groups for recreational opportunities (i.e. boat launch and river walk).**

C. Enhancement of Watershed Fisheries Action Items:

- 1. Provide technical assistance and general direction to local grass-roots efforts, watershed associations and fisheries organizations to enhance existing fisheries. (DCPD, SCMP staff, DEP)**
- 2. Work with the Delaware County Chamber of Commerce, Central Catskills Chamber of Commerce, and the Recreation and Fisheries sub-committees to install boat launch access points along the West & East Branch Delaware River and to promote recreational fishing in the Cannonsville and Pepacton Reservoirs. Support the new boating program through outreach promotional activities such as sponsored fishing days, boating safety and fishing safety courses, etc. (SCMP Staff, DCPD, DEP, EBDR Recreation and Fisheries sub-committee, CWC, DC Chamber of Commerce)**
- 3. Encourage groups to work with municipalities to apply for funding through SMIP for projects that improve fish habitat, angling opportunities and an understanding of and appreciation for the aquatic ecosystem. (SCMP Staff, DCPD, DEP, PAC)**
 - a. Work with Trout Unlimited to plant trees in the riparian buffer with volunteer groups and schools.**
 - b. Work with Trout Unlimited with culvert assessment and provide technical assistance for highway superintendents.**

2. Local Flood Hazard Mitigation Program

In response to major flood events in 2006 and 2011, the Delaware Stream Corridor Management Program partners have advanced the proposal for a watershed wide flood hazard mitigation effort that will identify the most beneficial projects for reducing flood related losses and water quality impacts and provide funds to implement those projects. In coordination with the CWC and at the request and direction of municipal government, the program will assist with the analysis, planning, funding, design and construction of hazard mitigation projects beginning during this Action Plan period. This effort will require the cooperation of all relative government entities, utilize the support of consultants and rely on the local knowledge of community leaders and residents. Funds will be made available for LFA recommended projects through the SMIP.

A. Flood Hazard Mitigation and Flood Recovery Action Items:

- 1. Provide assistance to the Delaware County Planning Department and Delaware County Emergency Services through steering committee meetings for the regular updates of the Multi-Jurisdictional All-Hazards Mitigation Plan. (DCSWCD SCMP Coordinator)**
 - a. The All-Hazard Mitigation Plan has been approved by FEMA – Municipalities are currently in the process of adopting the All-Hazard Mitigation Plan. The plan can be found online: <https://delaware.mitigateny.org/> (2/11/22)**
- 2. Provide documentation of completed flood hazard mitigation projects to the Hazard Mitigation Coordinator. Enhance the All-Hazard Mitigation Plan through the development of Local Flood Hazard Mitigation Plans (LFHMP) and by the implementation of the All-Hazards Mitigation Plan. (SCMP Staff)**

3. Provide assistance as requested by the Director of Emergency Services to the Emergency Operations Center during flood related events. (SCMPr Staff)
4. Maintain a list of historic problem areas where streams impact infrastructure during flood events and correlate to stream gage stage heights. (SCMPr Staff)
5. Work with communities to understand, utilize and revise FEMA floodplain maps. (DCPD, DEP Project Manager, NYSDEC, SCMPr Staff)
 - a. Continue to work with SLR consultant to finalize the East Brook Letter of Map Revision (LOMR) to FEMA. FIRM maps updates will benefit 41 properties and will remove 22 homes from the Special Flood Hazard Area. Certified letters have been sent to notify property owners and encouraged owners to maintain flood insurance at a reduced rate.
6. Provide scholarships for training opportunities for Certified Floodplain Managers (CFM) and Code Enforcement credits
 - a. New York State Floodplain and Stormwater Workshop in Schenectady, NY on May 3-5
7. Work with communities to update local ordinances, laws and comprehensive land use plans to incorporate elements of the Stream Corridor Management Plan, its recommendations and stream stewardship principles. (DCPD, SCMPr Staff)
8. Provide technical assistance to municipalities with emergency stream intervention measures during flood recovery. (SCMPr Staff)
9. Support educational programs for the public and school students that promote a better understanding of meteorology, hydrology, hydraulics and flood issues. (DCPD, SCMPr Staff)
10. Design and implement flood mitigation practices including but not limited to floodplain reclamation, scientific channel dimensioning, and natural stream design techniques throughout the Delaware Watershed. (SCMPr Staff, DEP)
11. Implement the Local Flood Hazard Mitigation Program including the development and refinement of program rules, guidelines, procurement documents as well as providing guidance and outreach to participating communities, support of the consultants, and input on the identification and prioritization of projects. Provide assistance with the acquisition of grant funds and technical support for project design and construction (implementation). (DCSWCD staff, DC Planning staff, DEP)
12. Provide funds for the Local Flood Analysis process and recommended flood hazard mitigation stream projects through the SMIP.
 - Pleasant Valley Brook / EBDR Confluence Debris, Town of Roxbury
 - Maple Avenue Culvert Replacement, Village of Hobart
 - Andes Central School Stream Corridor Restoration, Town of Andes
 - Price Chopper Berm Removal, Village of Delhi
 - South Street Culver Replacement, Village of Stamford
 - Elk Creek Road Toe Cut Problem, Town of Halcott
 - Vega Mountain Road Trib. Culvert Replacement, Town of Roxbury

13. Work with the following Flood Commissions to Implement the LFA plan recommendations:

- **Walton Flood Commission: West Branch Delaware River & Tributaries (East Brook, West Brook, Third Brook)**
- **East Branch Delaware Flood Commission including: Fleischmanns / Clovesville, Middletown, Arkville**
- **Delhi Flood Commission**
- **Hamden Flood Commission**
- **Andes Flood Commission**
- **Stamford Flood Commission**
- **Roxbury Flood Commission**
- **Halcott Flood Commission**

14. Work with the municipalities located in the 1997 designated MOA hamlets for interest in LFA plan. In 2022, DCSWCD identified a next set of eligible communities to consider for LFAs:

- **Town of Andes: One site on the Tremper Kill (within an existing LFA municipality)**
- **Town of Bovina: Three sites along the Little Delaware River**
- **Town of Kortright: Bloomville**
- **Town of Meredith: Meredith Square**
- **Town of Middletown: New Kingston, Dunraven, and Halcottsville**
- **Village of Margaretville: Village limits and extension**
- **Town of Tompkins: Trout Creek**

3. Catskill Streams Buffer Initiative (CSBI) funding

Catskill Streams Buffer Initiative (CSBI), established in 2009, provides a mechanism whereby streamside landowners, with property within the New York City Watershed, can receive technical assistance, educational materials, planning assistance, and funding to improve and maintain their riparian (streamside) areas. CSBI is a part of the overall Stream Management Program, and is a complement to other existing stream management programs. The CSBI program focuses on improving riparian buffer protection for private, non-agricultural landowners who are not covered or supported through other riparian protection programs within the East and West Branch Delaware River watersheds.

The overall goals of CSBI are to inform and assist landowners in better stewardship, and to work with landowners to identify practices to improve their riparian (streamside) areas, through proper management, protection, restoration, or enhancement. To achieve these goals, CSBI will assist riparian landowners throughout the Delaware Watershed by providing:

- 1) Access to technical assistance through their DCSWCD concerning their streamside property.
- 2) Development of Riparian Corridor Management Plans (RCMP) to create awareness about riparian management issues specific to individual properties.
- 3) Development of Best Management Practices (BMP) and prescriptive measures to improve landowner management of their riparian buffer in order to enhance the function and condition of the riparian buffer.
- 4) Assistance with installation of riparian buffer improvement measures, such as native plantings, and other prescriptive projects.
- 5) Educational materials and activities as needed by landowners to understand the critical role of their buffer and how to maintain it in optimal functioning condition.

The Action Items associated with these goals for the years 2022 – 2024 are identified below.

A. Stream Corridor Management Plans for Non-Agricultural Riparian Landowner Stewardship Action Items

1. Continue the implementation of the Catskill Streams Buffer Initiative (CSBI) through the DCSWCD Stream Corridor Management Program Contract funded by DEP. (DCSWCD CSBI Coordinator, DEP Project Manager).
2. Periodically review and update the protocol for prioritizing the implementation of the Catskill Streams Buffer Initiative and strategies for soliciting participation in the program. (DCSWCD CSBI Coordinator, SCMPr Coordinator, DEP Project Manager)
3. Development of a minimum of 24 Riparian Corridor Management Plans (RCMP) by the end of the 2025 DCSWCD/DEP contract. (DCSWCD CSBI Coordinator, DCSWCD SCMPr Staff)
4. Implement a minimum of 5 Riparian Corridor Management Plans per year by means of contractual planting services. (DCSWCD CSBI Coordinator)
5. Installation of at least 2 bioengineering projects by the end of the 2025 DCSWCD/DEP contract. (DCSWCD CSBI Coordinator)
6. Installation of a minimum of 5,000 streambank feet of revegetation by the end of the 2025 DCSWCD/DEP contract. (DCSWCD CSBI Coordinator)

CSBI Projects scheduled for 2022-2024 are listed below:

CSBI Riparian Corridor Management Planting Projects				
<u>Project Title</u>	<u>Location</u>	<u>Length (feet)</u>	<u>Acres</u>	<u>Planned Implementation</u>
Cal Terry Riparian Restoration	Town of Hamden	300	3.0	2022
SUNY Delhi Planting	Town of Delhi	100	0.50	2022
Old Herrick Road Riparian Plantings (Phase 3)	Town of Middletown	200	0.6	2022
East Brook-D'Orazio (Post-Stream Restoration) Planting	Town of Walton	500	1.5	2022
Winter Hollow New Access & Repair	Hamlet of New Kingston	500	1.0	2022
Delaware Basin Invasive Species Control	Delaware Basin	NA	NA	2022
Hardscrabble Planting-Rodregues	Town of Roxbury	600	1.5	2022
Mill Brook Planting – Beyea	Town of Hardenburgh	950	1.0	2022
Beech Hill Post-Knotweed Control Planting	Town of Andes	1,300	2.2	2022
Vly Creek Restoration-Brush Ridge Associates	Town of Middletown	900	5.0	2022
2022 Totals		5,350	16.3	

Mead Road Post Knotweed Control Planting	New Kingston	1,560	8.0	2023
Monroe Rd restoration	Delhi	960	1.10	2023
Sherwood Rd-Delhi	Delhi	340	0.25	2023
Samuels Planting & Restoration	Sydney Center	330	0.40	2023
SUNY Delhi Spring/Fall Plantings	Delhi	200	1.0	2023
Delaware Basin Invasive Species Control	Delaware Basin	NA	NA	2023
2023 Totals		3,390	10.75	

CSBI Projects completed in 2021 are listed below:

CSBI Riparian Corridor Planting Projects – Completed 2021				
<u>Project Title</u>	<u>Location</u>	<u>Length (feet)</u>	<u>Project Acres</u>	<u>Status</u>
West Terry Clove Debris Removal	Town of Hamden	(1,400)	(3.0)	Complete 2021
SUNY Delhi Spring Planting	Town of Delhi	100	0.50	Complete 2021
SUNY Delhi Fall Planting	Town of Delhi	100	0.50	Complete 2021
Planting Project Totals		1,600	4.0	

7. Implement 1 demonstration or educational Riparian Corridor Management Plan per year. (DCSWCD CSBI Coordinator)

- a. Educational RCMP implementation:
- b. Conduct volunteer plantings or educational workshops with community groups and local students.
- c. Conduct a volunteer educational workshop on bare-root transplant to containers or tree planting events with local high school students, SUNY Delhi college students and BOCES students to promote the benefits of riparian buffers.

CSBI Student/Educational Planting Projects & Workshops 2022 - 2024			
<u>Project Title</u>	<u>Location</u>	<u>Scheduled for Completion</u>	<u>Project Type</u>
Trees for Trout - East Branch Delaware River Planting	East Branch Delaware River	Seasonally 2022-2024	Volunteer Planting
Riparian Forest Buffer Walks	Margaretville	Ongoing Yearly	Workshop
DCMO-BOCES Student Plantings	Walton	Yearly 2022-2024	Student Plantings
Catskill Youth Climate Summit	Catskill Region	April 2022	Workshop
SUNY Delhi Outdoor Education Center Spring & Fall Plantings (SUNY Delhi Students)	Town of Delhi	Ongoing Yearly	Student Plantings
Bare-root transplant Activity – DCMO BOCES/Students	DCSWCD, Walton	Ongoing Yearly	Student Workshop
Camp H2O	East Branch Delaware River	June 15, 2022	Student Workshop

- 8. Education and outreach for CSBI shall be accomplished by facilitating at least one riparian workshop for landowners per year. Education and outreach shall also be accomplished by active participation at relevant local events, direct mailings, website usage, and local media. (DCSWCD CSBI Coordinator)**

CSBI Education & Outreach Events		
<u>Project Title</u>	<u>Location</u>	<u>Date</u>
Riparian Buffer Working Group	Kingston	Annually
Various Student Events/Plantings	Cannonsville & Pepacton Watersheds	As needed 2022-2023
Walton 4H outreach & planting events	Walton	As needed/as requested 2022-2023
Bare-root transplant Activities – DCMO BOCES/Students	DCSWCD, Walton	Annually
Riparian Walks/Workshops	Various locations	Annually
Forestry Festival – Stream Table / Riparian Buffer Display	Village of Margaretville	Annually*
Cauliflower Festival – Stream Table / Riparian Buffer Displays	Village of Margaretville	Annually*
Delaware County Fair	Town of Walton	Annually*
Youth Climate Summit Workshops	Catskill Region	Annually

* Note: Pending outreach events occur in 2022 due to COVID-19 pandemic limitations.

9. Secure for all CSBI projects, landowner license and maintenance agreements for access by DCSWCD and DEP to facilitate ongoing maintenance and monitoring. (DCSWCD CSBI Coordinator)
10. Develop planting plans as requested for applicable stream program projects in coordination with stream program staff. (DCSWCD SCMPr Staff and DCSWCD CSBI Coordinator)
11. Develop and implement a monitoring program for riparian buffer projects to identify project success and effectiveness. (DCSWCD CSBI Coordinator, DEP CSBI Coordinator)
 - a. Monitoring protocol developed for all implemented CSBI (and supplemental) projects.

CSBI Yearly Project Monitoring		
<u>Year Monitored</u>	<u>Number Projects Sites</u>	<u># Plots Surveyed</u>
2021	19	65
2022	21	92
2023	18	85
2024	20	90

- b. Monitoring protocol was developed for invasive species monitoring of CSBI planting project locations.
12. Develop local resources to maintain availability of native vegetation planting stock as needed. (DCSWCD CSBI Coordinator)
 - a. Conduct bare-root transplant to containers event with Walton Central School and DCMO BOCES to secure supplemental plants and species for CSBI planting projects.
 - b. Work with SUNY Delhi summer interns to assist in project monitoring, invasive species eradication efforts and maintenance of plant stock for planting projects.
 - c. Collaborate with the DEP Project Manager on determining plant material needs and the coordination of logistics pertaining to delivery of native plant materials for riparian project planting sites.
13. Provide technical assistance to streamside landowners through ongoing coordination with the West-of-Hudson Riparian Buffers Working Group.

B. Implement a Variable Width Riparian Buffer Pilot Program Action Items

1. CSBI will continue to identify eligible sites for implementing variable width buffers. (DCSWCD CSBI Coordinator, DEP Project Manager, DCSWCD SCMPr staff)
2. Identify potential sites for demonstration of a variable width riparian buffer pilot project. Implement one demonstration project. (SCMPr Staff, DEP Staff, WAP Staff)

C. Implement a CREP/CSBI Riparian Buffer Pilot Program on Non-Agricultural Lands with the USDA Conservation Reserve Enhancement Program (CREP) Action Items

1. Implement the prioritization process for providing technical and financial assistance to the Watershed Agricultural Council (WAC) for fallow land CREP-CSBI projects and identify roles and responsibilities in implementation. (CREP-CSBI Pilot Program Working Group)
2. Conduct stream evaluation and assessment to determine Pilot Program eligibility, including if stream instability issues will preclude projects. Training and ongoing assistance to support evaluations and assessments. (CREP-CSBI Pilot Program Working Group)
3. Provide design support for the development and approval of conservation plans (Riparian Corridor Management Plans) and implementation of projects that facilitate CREP enrollment. (CREP-CSBI Pilot Program Working Group)
4. Provide CSBI cost-share funding to the Watershed Agricultural Council to facilitate fallow land CREP enrollment. (SCMPr Coordinator, SCMPr Staff, DEP Project Manager)
5. Monitor and evaluate the success of the CREP-CSBI projects. (SCMPr Staff)
6. Continue to monitor and evaluate metrics and report to assess the effectiveness of the extended Pilot Program (CREP-CSBI Pilot Program Working Group)
7. The Delaware County CREP-CSBI Pilot Program Working Group shall include: SCMPr Coordinator, SCMPr-CSBI Coordinator, DEP Project Manager, WAC Program Managers and Planner(s), DCSWCD and NRCS.

CREP/CSBI Riparian Corridor Management Planting Projects				
Project Title	Location	Length (feet)	Acres	Status
Upper East Brook – Site 1	Town of Walton	375	1.8	Planned for 2022
Upper East Brook – Site 2	Town of Walton	1,230	3.3	Planned for 2023
East Brook (D’Orazio) Post Restoration Planting	Town of Walton	500	1.5	Planned for 2022
Uplands Center Planting	Town of Walton	2,300	31.2	Planned for 2022
Frank-Tremperkill Restoration	Town of Andes	850	3.9	Planned for 2022
Palen-Winter Hollow Planting	New Kingston	1,475	5.5	Planned for 2022
Project Totals		6,230	45.70	

CREP/CSBI Riparian Planting Projects – Completed 2021				
<u>Project Title</u>	<u>Location</u>	<u>Length (feet)</u>	<u>Project Acres</u>	<u>Status</u>
Winter Hollow Riparian Planting (CREP/CSBI)	Hamlet of New Kingston/Town of Middletown	2,850	12.15	Complete 2021
West Terry Clove Riparian Planting (CREP/CSBI)	Town of Hamden	1,560	5.38	Complete 2021
Planting Project Totals		4,410	17.53	

D. Invasive Species Management Action Items

1. Continue to work collaboratively with Delaware County Solid Waste Facility to compost Japanese Knotweed. (SCMP staff, DCDPW)
 - a. Continue to treat invasive species such as Japanese knotweed on CSBI project sites with a variety of methods including herbicide application and monitor the effectiveness of methods.
 - b. Conduct a Japanese Knotweed pull and clean up educational workshop with local community groups and SUNY Delhi college students.

CSBI Invasive Species Control Projects		
<u>Project Title</u>	<u>Location</u>	<u>Scheduled for Completion</u>
Mead Road Knotweed Control	New Kingston	Ongoing thru 2022
Kelly's Kayaks Knotweed Control	Halcottsville	Ongoing thru 2022
Depot Street Knotweed Control	Fleischmanns	Ongoing thru 2022
Upper East Brook Road IS Control	Town of Walton	Ongoing thru 2022
Vly Creek IS Control	Town of Halcott	Completed 2022
East Brook IS Control-Siegel	Town of Walton	Ongoing thru 2023
East Brook IS Control-Hobbs	Town of Walton	Ongoing thru 2023
East Brook IS Control-D'Orazio	Town of Walton	Ongoing thru 2023
East Brook IS Control-Parrinello	Town of Walton	Ongoing thru 2023
Delhi – Delaware Ave Knotweed	Town of Delhi	Ongoing Thru 2022
Kerr's Creek Knotweed Control	Town of Walton	Ongoing thru 2024
Cal Terry Invasive Species Control	Town of Hamden	Ongoing thru 2023
East Brook Farm Knotweed Control	Town of Walton	Ongoing thru 2022

2. Continue to participate in Catskill Regional Invasive Species (CRISP). (SCMP staff, DCPD)
3. Working with program partners and local agencies on developing Japanese knotweed control focus group.

4. Restoration Projects

Restoration projects utilize new and innovative stream management techniques with educational value. These projects make use of fluvial geomorphic principles and the scale of the project may vary from localized activities such as stream bank stabilization to more extensive stream restoration projects.

A. Debris Management Action Items

- 1. Develop a Delaware County protocol for municipalities to manage woody debris in stream systems. (DCSWCD SCMPr Coordinator, DEP Project Manager, DCDPW)**
- 2. Design and implement two demonstration projects that utilize the woody debris protocol developed by the SCMPr. (SCMPr Staff)**
 - a. Steele Brook woody debris removal SMIP grant completed in 2021.**
 - b. Town of Hardenburgh debris removal SMIP grant – Pending DEP final approval**
 - c. Village of Margaretville debris removal SMIP grant – Pending DEP final approval**
- 3. Undertake a periodic review of the woody debris protocol developed by the SCMPr. (SCMPr Staff, DEP Staff)**

B. Stream Gravel Deposition Issues Action Items

- 1. Develop and implement an educational and outreach program to teach municipal leaders and community members about the specific stream processes involved in the mobilization and transport of gravel and debris. Continue to promote training in Post-Flood Stream Intervention practices. (SCMPr Staff)**
 - a. Continue to support the Walton Central School students with the gravel study and encourage additional studies that were funded with a SMIP grant to study sediment issues in streams near the bridges in the Village of Walton. The SMIP grant was completed in 2015, but the program will continue the gravel study in the environmental class curriculum.**
- 2. Continue to encourage one or two municipalities to apply for grant funding through the SCMPr to scientifically study stream reaches with identified gravel deposition issues for potential case studies to be used in Item 1. This could be accomplished through the Local Flood Hazard Mitigation Analysis process. (SCMPr Staff)**
 - a. MacGibbon Hollow stream in the Town of Walton on hold until the Town of Walton recommends to proceed with the project.**
- 3. Continue to implement and monitor the West Branch Delaware River tributary bedload transport study to utilize passive radio frequency identification (RFID) tracers deployed into three study locations in East Brook tributary. This scientific study will determine the relation of discharge to the movement and displacement of sediment. (SCMPr Staff)**
 - a. East Brook in the Village of Walton was selected as the study area in (2019). A variety of rocks were collected and measured before the RFID were placed in the drilled holes and epoxied. The rocks were placed back into East Brook stream in approximately the same location. The rocks will be found using an antenna and the location GPS after a significant storm. Field work and monitoring the movement of sediment will continue in 2022-2025.**

4. Design and implement two demonstration projects that utilize the existing gravel management protocol developed by the SCMP. (SCMP Staff)
 - a. Continue to photo monitor the Post-Flood Emergency Stream Intervention project located in the Town of Hamden on Launt Hollow stream that was completed in 2009. The Hamden Highway Department maintains the stream channel to the proper width and depth for approximately 100 linear feet whenever the stream capacity is compromised with gravel.
 - b. MacGibbon Hollow and Marvin Hollow in the Town of Walton
5. Undertake a periodic review of the gravel maintenance protocol developed by the SCMP. (SCMP Staff, DEP Staff)

C. Nutrient Loading Study Action Items

1. Implement the West Branch Delaware River nutrient loading study to assist in the prioritization of projects. This scientific study will determine the relation of discharge to streambank erosion and the loading of Total Phosphorus (TP) and Total Nitrogen (TN) into the West Branch Delaware River. (SCMP Staff)
 - a. The confluence of Bagley Brook and the West Branch Delaware River on the River Haven Farm in the Town of Hamden was selected as a study area. An eroding streambank along a corn field is contributing excessive amounts of sediment to the river system. Several soil samples were taken and sent for laboratory analysis to determine the concentration of TP and TN in the loaded sediment. GIS analysis was used to determine volume of eroded soil. Together, these variables allow for the calculation of total mass of TP and TN loading at this site.
 - b. An eroding streambank along the West Branch of the Delaware River at the Birdsong Farm in the Town of Hamden was selected as a second study area. An eroding streambank along a hay field is contributing excessive amounts of sediment to enter the river system. Several soil samples were taken and sent for laboratory analysis to determine the concentration of TP and TN in the loaded sediment. GIS analysis was used to determine volume of eroded soil. Together, these variables allow for the calculation of total mass of TP and TN loading at this site.
 - c. "Two Nutrient Loading Case Studies at Significant Streambank Erosion Sites on the West Branch Delaware River" was finalized and submitted to FAD regulatory authorities in October 2021. This report includes results from the data collected from the two projects listed above.
 - d. Additional sites will be selected for study in 2022-2024 using GIS analysis. Sites will be chosen based on severity of erosion and nutrient content using the same process outlined for the River Haven Farm and Birdsong Farm sites.

D. Utilize Existing Funding Sources Action Items

1. Continue to explore opportunities for utilizing grant funding sources to match SCMP funds for implementing recommendations. (DCSWCD SCMP Coordinator)
 - a. Army Corps of Engineer's Water Resources Development Act (WRDA)
 - i. Bull Run Stream Slope Stabilization in the Town of Middletown
 - ii. Steele Brook Streambank Stabilization in the Town of Delhi
2. Train staff and others within the watershed on how to prepare grant applications for obtaining additional funds for matching SCMP funds.

E. Demonstration/Restoration Projects for Construction in 2022 – 2023

- 1. Bull Run Streambank Repair, EBDR Middletown**
 - a. This project was recommended by the PAC to fund as a demonstration project for repair of a 2013 Emergency Watershed Protection stream project upon request from the Town of Middletown Supervisor. In 2013, the streambed had been stabilized using 3 hardened riffle structures and the toe of the embankment was protected with rip rap, which are still working. The steep embankment failed in the spring of 2016 and the top area liquefied with the frost thawing out of the soil and sent the whole face sliding down in a debris flow.**
 - b. 2022 Status: Milone and MacBroome, Inc. (now a part of SLR Consulting), an engineering consultant, has been selected to design the project. The project design is currently at 60%. Project is on hold.**

- 2. Steele Brook Streambank Stabilization, WBDR Delhi**
 - a. This project was recommended by the Local Flood Analysis (LFA) for the Town and Village of Delhi, written by a consultant, Woidt Engineering & Consulting, PC, for the Delhi Flood Commission. The project consists of a streambank stabilization on one of the worst slope failures in the Steele Brook watershed that impairs water quality with fine sediment and woody debris.**
 - b. 2022 Status: Phase 1 and Phase 2 of the project were 90% completed in 2021. The contractor needs to finish work on the access roads.**

- 3. East Brook CREP/CSBI Streambank Stabilization on East Brook, WBDR Walton**
 - a. This project was recommended by the CREP/CSBI program to repair eroding streambanks in order to establish a riparian buffer along fallow agricultural fields. This project is in the Town of Walton along East Brook in the West Branch of the Delaware River watershed.**
 - b. 2022 Status: Project was 90% completed in 2021. Riparian buffer planting is scheduled for Fall 2022.**

- 4. Village of Stamford South Street Culvert Replacement, WBDR**
 - a. This project was recommended in the Stamford LFA and sponsored by the Stamford Flood Commission to replace an undersized arch bridge that has partially collapsed and resulted in a road closure along South Street.**
 - i. 2021 Status: Delaware County SWCD Stream Staff have partnered with Delaware County DPW to design and replace the culvert. Task orders have been given to an Engineer Consultant to complete the bridge design and replacement. The project is expected to be constructed in 2023.**

5. **Grade Control at Utility Crossings on tributaries in the Village of Walton,**
 - a. **This project was recommended by the Walton Flood Commission and is a SMIP grant project to protect utility crossings on three tributaries within the Village of Walton.**
 - i. **Utility Crossing Site #4: West Brook – Austin Lincoln Park, North – 2022 Status: The project was completed in 2021.**
 - ii. **Utility Crossing Site #6: West Brook – East St. Bridge – 2022 Status: Delaware County SWCD Stream Staff completed the 100% design. The project bid advertisement was published in June 2021 with construction in Summer 2021. Project postponed due to the elevated water levels. Project construction will be rescheduled for June 15, 2022.**
 - iii. **Utility Crossing Site #8: West Brook – Delaware Street Bridge – 2022 Status: Delaware County SWCD Stream Staff is working on the 60% design. The project is anticipated to be constructed in 2022.**
 - iv. **West Brook Streambank Stabilization at Village Well – 2022 Status: Delaware County SWCD Stream Staff is working on the 10% design. The project is anticipated to be constructed in 2022.**
 - v. **Utility Crossing Site #10 and #13 – 2022 Status: the project is currently on hold until DCSWCD and NYCDEP come to agreement on prioritization against other projects.**

6. **River Haven Farm – West Branch Delaware River Restoration, WBDR Hamden**
 - a. **This project was recommended by the Local Flood Analysis for the Town of Hamden along the West Branch of the Delaware River written by a consultant, Milone and MacBroom Inc. (now a part of SLR Consulting), for the Hamden Flood Commission. The bank erosion and channel instability is an ongoing problem at the confluence of Bagley Brook. A geomorphic assessment was completed on Bagley Brook in 2021 to evaluate the problem of channel instability and sediment contribution to the West Branch. The information that gathered will be used for the design of a restoration project.**
 - i. **2022 Status: Delaware County SWCD Stream Staff collected soil data 2019-2020. Topographic survey and Rosgen Level I assessments were completed in summer 2020. “Two Nutrient Loading Case Studies at Significant Streambank Erosion Sites on the West Branch Delaware River” has been completed and submitted to the NYS DOH. Delaware County SWCD Stream Staff is working on the 30% design. The project is anticipated to be constructed in 2023.**

7. **Andes Central School Grade Control, Floodplain Benches, Bridge Replacement, Town of Andes**
 - a. **This project was the identified in the Andes Local Flood Analysis Plan. Stacked rock walls line the banks of both Liddle Brook and the Tremper Kill on the school’s property; sections of these rock walls have collapsed in recent years due to streambed degradation. Hydraulic erosion will continue to undermine the rock walls and, in turn, threaten school property, private property, school-owned infrastructure, and town-owned infrastructure. Increasing the span of Andes Central School’s transportation bridge over Liddle Brook is also recommended in the Andes LFA. Bridge replacement would not only reduce flooding on State Route 28 and adjacent residences, per the LFA, but it would also replace a failing structure that provides the only vehicular access to the school.**
 - b. **2022 Status: Delaware County SWCD Stream Staff is working on the 60% design. The project is anticipated to be construction in 2023 as the design for the bridge replacement is finalized.**

8. **Pleasant Valley Brook / East Branch Delaware River Confluence Debris Clean-up, Town of Roxbury**
 - a. This project was the identified in the Roxbury Local Flood Analysis Plan. The stream channel is plugged with sediment and debris which frequently floods the Kirkside Park. The purpose of this project is to remove obstructions in Pleasant Valley Brook and properly dimension 95 linear feet of stream channel to reestablish a single channel and create a better alignment to confluence with the East Branch Delaware River.
 - b. **2022 Status:** Delaware County SWCD Stream Staff is working on the 100% design. The project is anticipated to be constructed in 2022.

9. **West Brook SL 5.58 Site on Foreman's Property, Walton**
 - a. This project was the identified after the December 2020 storm event. The Foreman's own approximately 0.43 miles of property on either side of West Brook. Currently, this land is being used for agricultural purposes and is rented to David Holley, a dairy farmer and a participant of the Watershed Agricultural Program. Excessive sediment deposition toward the upstream end of the Foreman property has contributed to the lateral migration of West Brook and subsequent erosion of West Brook's right bank. The right bank erosion continues downstream for approximately 425 linear feet to an existing hardened agricultural crossing.
 - b. **2022 Status:** The project was completed in 2021.

5. Conservation Reserve Enhancement Program (CREP) Assistance

Provide assistance for the implementation of Conservation Reserve Enhancement Program (CREP) in agricultural areas where streambank stability issues make those lands ineligible for buffer enhancement under the CREP's guidelines.

- A. Integration of the Stream Corridor Management Program and the Watershed Agricultural Program Action Items**
 1. Provide stream assessment training to Watershed Agricultural Program's planning and technical staff to identify and classify impaired stream segments during the development or revision of individual Whole Farm Plans. (SCMP and WAP Staff)
 2. Continue to implement the MOU between DCSWCD and the Watershed Agricultural Council (WAC) and its protocols for providing technical assistance to the Watershed Agricultural Program. (DCSWCD SCMP Coordinator, DCSWCD Executive Director, and DCSWCD Technical Coordinator, DEP Project Manager)

3. Provide assistance to the WAP Planning Staff in techniques for proper placement and planning of stream related agricultural Best Management Practices. (DCSWCD SCMP Staff)
 - a. Complete work on the following CREP streambank stabilization projects
 - i. Willard Frisbee Farm

2022 Status: Preliminary survey completed. Additional survey with unmanned aerial vehicle (UAV) is needed in 2022 to update the design drawings with the extent of bank erosion and monitor.
 4. Provide engineering approval, technical support, regulatory permit and individual project design assistance to Watershed Agricultural Program engineers and technicians as per the Protocol identified in action item #2 above. (DCSWCD SCMP Coordinator, SCMP Professional Engineer, and DCSWCD SCMP Staff)
 5. Provide a standard operation procedure for floodplain disturbance permits to be filed with the Code Enforcement Officers (CEO) across the county.
 6. Provide opportunity for annual floodplain development permit training for Watershed Agricultural Program engineers, technician and planners. (SCMP Staff, CEO)
- B. Provide Technical Support to the USDA Conservation Reserve Enhancement Program (CREP) Action Items**
1. Continue to develop the prioritization process for providing technical and financial assistance to the WAP on CREP projects. (SCMP Coordinator, DEP Project Manager, WAP Program Managers)
 2. Provide stream evaluation and assessment assistance to the Watershed Agricultural Program planners to determine if stream instability issues will preclude CREP enrollment. Training and ongoing assistance. (SCMP Coordinator, SCMP PE, SCMP technicians, and DEP as needed)
 3. Provide design and regulatory permit assistance and engineering approval to the Watershed Agricultural Program engineers and technicians in the preparation of approved stream stabilization designs and projects that facilitate CREP enrollment. (SCMP Coordinator, SCMP PE, SCMP technicians, and DEP as needed)
 4. Continue to provide funding to the Watershed Agricultural Program for stream stabilization projects that facilitate CREP enrollment. (SCMP Staff)
 5. In cooperation with the Watershed Agricultural Program, evaluate stream instability issues for remediation on existing CREP sites. (SCMP Coordinator, SCMP PE, and SCMP Technicians)
 6. Provide funding to the Watershed Agricultural Program for stream projects that stabilize existing CREP sites. (SCMP Staff)
 7. Continue to monitor and evaluate the success of the bank stabilization projects. (SCMP Staff)

C. Enhance the Implementation of CREP on NYC Watershed Cropland and Explore Long – Term CREP Contract Action Items

1. Develop an interagency working group to prepare a white paper requesting USDA / FSA to enhance rental payments for CREP riparian buffers on cropland. (WAP Staff, DEP Staff, SCMPR Staff)
2. Explore options to maintain riparian buffers after CREP contract expiration and submit written recommendations. Development of an interagency advisory committee with Delaware County. (WAP Staff, SCMPR Staff, DEP Staff, DC Staff)

6. Stream Corridor Management Program Technical Assistance and General Support

Stream Corridor Management Program staff from each of the partnering agencies (the Delaware County Soil and Water Conservation District, New York City Department of Environmental Protection and Delaware County Planning Department) to provide technical, planning and educational support for a range of stakeholders on water quality related issues such as floodplain management, flood response and recovery, debris and infrastructure management, property protection, aquatic habitat and recreation concerns. Support can include assessments, plans, designs, training workshops and general advice to stakeholders.

A. Provide Assistance to Community Watershed Groups/Associations and Government Entities Action Items

1. Provide technical assistance and general direction to community watershed groups/association and government entities. (DCPD, SCMPR staff, DEP)
 - a. East Branch Delaware Flood Commission
 - b. Walton Flood Commission
 - c. Delhi Flood Commission
 - d. Hamden Flood Commission
 - e. Andes Flood Commission
 - f. Roxbury Flood Commission
 - g. Halcott Flood Commission
 - h. Stamford Flood Commission
 - i. Coalition of Watershed Towns
 - j. Recreation Access groups (Catskill Foundation and Water Discovery Center)
 - k. Delaware County Board of Supervisors
2. Potential Flood Commission formation in the following communities:
 - a. Town of Bovina
 - b. Town of Kortright
 - c. Town of Meredith
 - d. Town of Middletown
 - e. Village of Margaretville
 - f. Town of Tompkins

B. Participation with the Delaware County Action Plan (DCAP) Action Items

- 1. Attend regular meetings of the Delaware County Action Plan (DCAP) and advocate for inclusion of Stream Corridor Management Plan and its recommendations into all relevant components of the DCAP. (DCPD Director, DCSWCD Executive Director, SCMPr Coordinator)**

C. Participation with the Catskill Watershed Corporation Action Items

- 1. Provide technical assistance as requested for stream related CWC funded projects. (SCMPr Staff, DEP Staff, CWC Staff)**
- 2. Explore ways to coordinate stream related education and outreach efforts (such as Catskill Streams and Watershed Education Program) with CWC. (SCMPr Staff, CWC Staff)**
- 3. Coordinate with CWC on Local Flood Hazard Mitigation Program including the analysis of flood problems, identification and funding of potential mitigation projects. (Executive Directors and staff of DCSWCD, DEP, DC Planning, and CWC)**

D. Provide Annual Floodplain Development Permit Training for Municipal Officials Action Items

- 1. Provide opportunity for annual floodplain development permit training for local municipal officials. (PAC, SCMPr Staff, DEP, NYS DEC)**
- 2. Provide technical assistance and education on the Community Rating System (CRS) to local municipal officials in the CRS program. (DCPD, SCMPr Staff)**
- 3. Development opportunity for Municipal Officials to obtain credits for participating in educational activities. (DCPD, SCMPr Staff)**
- 4. Support training of Floodplain Administrators (Code Enforcement Officers), Planners and Stream Managers in various aspects of floodplain management through State and Federal programs to enable them to achieve and maintain Certification as Floodplain Managers through the Association of State Floodplain Managers. (DEC, FEMA, ASFM)**
- 5. New York State Department of Environmental Conservation's 4-Hour Erosion and Sediment Control training offered annually to contractors, code enforcement officers, municipal engineers, highway departments and planning boards.**

E. Enhance Local Land Use Laws and Ordinances Action Items

- 1. Provide assistance to local municipalities in development of stream components in local comprehensive plans, local laws and local management practices. (PAC, DCPD, SCMPr Staff, DEP)**
- 2. Provide technical assistance to local municipalities to enhance local laws and local management practices. (PAC, DCPD, SCMPr Staff, DEP)**

F. Streamline Stream Work Permitting Action Items

1. Work in cooperation with NYS DEC, US Army Corps of Engineers, DEP, and DCDPW to enhance the authority thresholds of the DCSWCD General Permit as delegated by the NYS DEC for approved stream management practices within the County. (SCMPr Staff, DEP RRE and SMP staff, US Corps of Engineers, DCDPW, Highway Subcommittee)

G. Provide Technical Assistance to Local Highway Departments Action Items

1. Continue to fund, provide technical assistance and support in the 2025 DCSWCD/DEP contract on the Medium Hydraulic Structure Study SMIP contract to evaluate watershed culverts for hydraulic capacity and prioritize them for upgrade through the SMIP. (DCDPW, SCMPr Staff)
2. Provide technical and regulatory permit assistance and educational support to municipalities for sizing and the design of routine culvert replacements. (SCMPr Staff, DCDPW)
3. Enable municipalities to apply for funding through the SMIP grants for infrastructure projects causing stream instability and/or water quality issues. (SCMPr Staff, DCDPW)
4. Support the membership of and attend regular meetings of Municipal Highway Superintendents and keep them up to date on status of SWCD projects, training opportunities and flood recovery efforts.
5. Advise and assist WBDR and EBDR communities and the DCPD with updates to the local Highway Management Plans to address best management practices as they relate to roadway and stormwater infrastructure improvements. (SCMPr Staff, DCPD, DCDPW and EBDR communities)
6. Provide technical assistance to highway departments and DCDPW by reviewing potential stream crossings including; large culverts and bridges. (SCMPr Staff, DCDPW and EBDR communities)
7. Continue to support best management practices for construction of stream crossings through the SMIP by allowing the acquisition of necessary equipment (i.e. dewatering pumps, hydro-seeder, etc.) (SCMPr Staff, DCPD, DCDPW and PAC)

H. Geomorphic Assessments at Bridges and Culverts Action Items:

1. Continue to support the Delaware County Department of Public Work's (DC DPW) evaluation of Medium Hydraulic Structures (culverts) funded through the Delaware Watershed Stream Management Implementation Program grants. (SCMPr Program Coordinator, DCSWCD Engineering staff, DEP Project Manager and DEP Stream Engineering Coordinator and DCDPW)
2. Continue to give advice and/or fund municipalities through the grants program for the replacement of publicly owned stream crossing structures that are causing stream instability and/or water quality issues. (SCMPr Staff)

I. Continuation of Geomorphic Research / Assessments Action Items

- 1. Perform Rosgen Level II assessment of Steele Brook in Delhi. (SCMPr Staff, Delhi Flood Commission)**
- 2. Identify other river segments requiring geomorphic assessment and management plans. (SCMPr Staff , as needed consulting services)**
 - a. Beech Hill Brook in the Pepacton Reservoir watershed scheduled for SFI to be completed in 2022 field season.**
 - b. Additional SFI will be identified and prioritized in 2022-2024**
 - c. Stream Feature Inventories (SFIs) completed in 2017 on Steele Brook and tributary to Elk Creek in the Town of Delhi, a combined 5.2 miles assessed.**
 - d. SFI completed in 2018 on Little Red Kill in the Town of Middletown, 1.2 miles assessed.**
 - e. SFI completed in 2019 on Huntly Hollow in the Town of Colchester, 1.5 miles assessed.**
 - f. SFI completed in 2020 on the Management Unit 20 and 26 of West Branch Delaware River, 2.6 miles assessed.**
 - g. SFI completed in 2021 on Management Unit 21 of the West Branch Delaware River, 2.9 miles assessed.**
 - h. SFI completed in 2021 on Bagley Brook in the Town of Hamden, 6.7 miles assessed.**
 - i. SFI completed in 2021 on Sherruck Brook, 2.5 miles assessed.**
 - j. Complete a minimum of 6 SFIs by between 2018 and December 31, 2022.**
 - k. Continue using nutrient loading estimates to prioritize SFIs and assessments when possible.**
- 3. Perform stream assessment, survey, and monitoring using a drone in 2022. (SCMPr Staff)**
 - a. Utility Crossing Site #9: West Brook at Rail Road Crossing, Village of Walton**
 - b. West Brook Streambank Stabilization at Village Well, Village of Walton**
 - c. West Branch Bank Stabilization at Fair Grounds, Village of Walton**
 - d. Coles Clove Streambank Repair and Reinforcement, Town of Hamden**
 - e. Little Red Kill Streambank Stabilization, Town of Middletown**
 - f. Hamden Hill Road Stream Restoration, Town of Delhi**
 - g. Dryden Brook Bank Reinforcement, Town of Tompkins**
- 4. Continue bedload transport research in East Brook and its confluence with the West Branch Delaware River in the Village of Walton.**

J. Adopt Principles of Stream Stewardship at the Municipal Level Action Items

1. Adoption completed for the following:

Towns:

Andes
Bovina
Deposit
Colchester
Franklin
Halcott (Green County)
Hamden
Harpersfield
Kortright
Masonville
Meredith
Middletown
Roxbury
Sidney
Stamford
Tompkins
Walton

Villages:

Delhi
Hobart
Margaretville
Fleischmanns
Stamford
Walton

2. Promote and secure plan adoption and extension of MOUs within East and West Branch Delaware communities. (DCPD, SCMPr Staff)

- a. Memorandum of Understandings (MOUs) have been extended for all municipalities. These MOUs do not have an expiration, but have the opportunity to be terminated by either party upon 30 days written notice.

3. Encourage municipalities to continue to develop stream stewardship requirements in their local comprehensive plans and land use regulations. (DCPD, SCMPr Staff, DEP)

4. Encourage municipalities to continue to participate in the PAC and Sub-committees. (SCMPr Staff, DEP, DCPD)

K. Develop a Process for Updating the East and West Branch Delaware River Stream Corridor Management Plan Action Items

1. Seek input from PAC as to when to update the East and West Branch Delaware River Stream Corridor Management Plan and the Delaware Action Plan. (PAC, DCPD, SCMPr Staff, DEP staff)

L. Expand Public Education and Outreach Efforts Action Items

1. Fund and implement education and outreach activities identified and prioritized by the Project Advisory Committee. (PAC, SCMPr Staff)

- a. Complete a minimum of 5 workshops and 5 trainings by the end of the 2025 DCSWCD/DEP contract.

2. Continue to educate municipalities and communities on the importance of floodplain function and the benefits of preserving floodplains, and opportunities for improving flood protection and reducing flood damages through the refinement and use of digital flood insurance rate maps (DFIRMs), the participation in the LFHMP, and other State/Federal programs such as the Community Rating System. (DCPD Staff, SCMPr Staff, NYSDEC)
3. Develop and implement an education and outreach effort to support the LFHMP for a range of involved and affected stakeholders including community officials, involved outside government agencies, landowners, residents, and not for profit groups. (DCSWCD staff, DC Planning Department staff, Department of Watershed Affairs, DEP, CWC)
4. Provide training and education opportunities for new officials appointed to office on the following three topics as made necessary by turnover 1) Getting to Know Your Stream Management Plan and Program; 2) Floodplain Management and the NFIP Program; and 3) Stream Process 101.
 - a. Getting to Know Your Streams and Stream Management Program booklet was distributed to Town Supervisors, Village Mayors and Highway Departments along with the Delaware Watershed Stream Management Implementation Program grant applications. The booklet features the three topics listed above and can be found on the Delaware County Soil and Water Conservation District's website: www.dcswcd.org
5. Work with and support area schools and BOCES programs to educate students and promote awareness of stream process, floodplain preservation and streamside vegetation. Develop and promote a stream awareness program that can be used in area schools and with youth groups. (SCMPr Staff, DCPD staff, DEP, CWC, BOCES and area schools)
 - a. Continue to work with the Youth Climate Summit committee to plan a youth environmental conference and provide funding for Delaware County School students that are within communities with Stream Management MOU.
 - b. Work with the Water Discovery Center's Camp H2O in the planning and being on site during the day-long event. CSBI will lead riparian walks and supervise the use of the Stream Table and participate in other ways that enrich the students' understanding.
6. Provide training and outreach to area real estate agents and bankers about the importance of preserving floodplains and the required disclosures of floodplain development permitting requirements. (SCMPr Staff, DCPD staff and DEP)
7. Provide up-to-date information to the catskillstreams.org website as well as support for the revision and maintenance of the Catskill Streams website.
8. Participate in the West-of-Hudson watershed-wide education and outreach efforts.
9. Maintain an up-to-date project status and education outreach information on the Catskillstreams.org website.

M. Scientifically-Based Post-Flood Emergency Stream Intervention Action Items

- 1. Provide Post-Flood Emergency Stream Intervention training to contractors, local municipalities, and agencies on an as needed basis. (Workshop, SCMPr Staff, DEP Project Managers)**
 - a. Provide technical assistance to the State-wide Emergency Stream Intervention, on an as needed basis.**
 - i. Post-Flood training has become a widely accepted practice that is being recognized throughout the State as the preferred practice for stream mitigation after the flood. Many agencies have requested training, which is being provided through Soil and Water Conservation District across New York State as well as through NYS DEC.**
- 2. Continue to provide technical assistance to municipalities with emergency stream intervention measures during flood recovery. (SCMPr Staff)**
- 3. Continue to provide technical review assistance to local planning and town boards when working on projects that include streams, culverts or floodplain infringements. (DCPD, SCMPr Staff)**
- 4. Develop Post-Flood Emergency Stream Intervention Volume II with grade control structures and consideration for sediment supply.**