

DELAWARE COUNTY SOIL & WATER CONSERVATION DISTRICT
STREAM CORRIDOR MANAGEMENT PROGRAM

**DELAWARE WATERSHED
STREAM CORRIDOR MANAGEMENT PROGRAM**

**2018 – 2019 Action Plan for the
East and West Branch of the Delaware River**



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DCSWCD Stream Program
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Table of Contents

INTRODUCTION:	3
1. DELAWARE WATERSHED STREAM MANAGEMENT IMPLEMENTATION GRANT PROGRAM (SMIP)	4
A. SMIP ADMINISTRATIVE ACTION ITEMS:	4
B. ENHANCE RECREATION OPPORTUNITIES ACTION ITEMS:	7
C. ENHANCEMENT OF WATERSHED FISHERIES ACTION ITEMS:	7
2. LOCAL FLOOD HAZARD MITIGATION PROGRAM	8
A. FLOOD HAZARD MITIGATION AND FLOOD RECOVERY ACTION ITEMS:	8
3. CATSKILL STREAMS BUFFER INITIATIVE (CSBI) FUNDING	10
A. STREAM CORRIDOR MANAGEMENT PLANS FOR NON-AGRICULTURAL RIPARIAN LANDOWNER STEWARDSHIP ACTION ITEMS	10
B. IMPLEMENT A VARIABLE WIDTH RIPARIAN BUFFER PILOT PROGRAM ACTION ITEMS	14
C. IMPLEMENT A RIPARIAN BUFFER PILOT PROGRAM ON NON-AGRICULTURAL LANDS WITH THE USDA CONSERVATION RESERVE ENHANCEMENT PROGRAM (CREP) ACTION ITEMS	14
D. INVASIVE SPECIES MANAGEMENT ACTION ITEMS	15
4. DEMONSTRATION PROJECT FUNDING	16
A. DEBRIS MANAGEMENT ACTION ITEMS	16
B. STREAM GRAVEL DEPOSITION ISSUES ACTION ITEMS	16
C. UTILIZE EXISTING FUNDING SOURCES ACTION ITEMS	17
D. DEMONSTRATION PROJECTS FOR CONSTRUCTION IN 2018 AND 2019	17
5. CONSERVATION RESERVE ENHANCEMENT PROGRAM (CREP) ASSISTANCE	19
A. INTEGRATION OF THE STREAM CORRIDOR MANAGEMENT PROGRAM AND THE WATERSHED AGRICULTURAL PROGRAM ACTION ITEMS	19
B. PROVIDE TECHNICAL SUPPORT TO THE USDA CONSERVATION RESERVE ENHANCEMENT PROGRAM (CREP) ACTION ITEMS	19
C. ENHANCE THE IMPLEMENTATION OF CREP ON NYC WATERSHED CROPLAND AND EXPLORE LONG – TERM CREP CONTRACTS ACTION ITEMS	20
6. STREAM CORRIDOR MANAGEMENT PROGRAM TECHNICAL ASSISTANCE AND GENERAL SUPPORT	21
A. PROVIDE ASSISTANCE TO COMMUNITY WATERSHED GROUPS/ASSOCIATIONS AND GOVERNMENT ENTITIES ACTION ITEMS	21
B. PARTICIPATION WITH THE DELAWARE COUNTY ACTION PLAN (DCAP) ACTION ITEMS	21
C. PARTICIPATION WITH THE CATSKILL WATERSHED CORPORATION ACTION ITEMS	21
D. PROVIDE ANNUAL FLOODPLAIN DEVELOPMENT PERMIT TRAINING FOR MUNICIPAL OFFICIALS ACTION ITEMS	21
E. STREAMLINE STREAM WORK PERMITTING ACTION ITEMS	22
F. PROVIDE TECHNICAL ASSISTANCE TO LOCAL HIGHWAY DEPARTMENTS ACTION ITEMS	22
G. GEOMORPHIC ASSESSMENTS AT BRIDGES AND CULVERTS ACTION ITEMS:	23
H. CONTINUATION OF GEOMORPHIC RESEARCH / ASSESSMENTS ACTION ITEMS	23
I. ADOPT PRINCIPLES OF STREAM STEWARDSHIP AT THE MUNICIPAL LEVEL ACTION ITEMS	23
J. DEVELOP A PROCESS FOR UPDATING THE EAST AND WEST BRANCH DELAWARE RIVER STREAM CORRIDOR MANAGEMENT PLAN ACTION ITEMS	24
K. EXPAND PUBLIC EDUCATION AND OUTREACH EFFORTS ACTION ITEMS	24
L. SCIENTIFICALLY-BASED POST-FLOOD EMERGENCY STREAM INTERVENTION ACTION ITEMS	25

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, New York City Department of Environmental Protection (NYCDEP), and Delaware County Planning Department (DCPD). Since their adoption, DCSWCD in partnership with DCPD and NYCDEP have been implementing the 36 recommendations contained in the two plans following priorities established in the Action Plan for each basin. This Action Plan update for the period 2018-2019 combines the previously separate Action Plans for each basin into a combined 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_r) in the implementation of the recommendations. The PAC is assisted by four sub-committees with the following focus: Fisheries and Recreation, Education and Outreach, Highway Infrastructure, and Floodplain Management. These sub-committee contribute their expertise to furthering the fulfillment of the relevant recommendations of the SCMP.

The implementation of the recommendations are 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
- ❖ Demonstration Project Funding
- ❖ Conservation Reserve Enhancement Program (CREP) Assistance
- ❖ Stream Corridor Management Program Technical Assistance and General Support

1. Delaware Watershed Stream Management Implementation Grant Program (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 offered through an annual application process with grants targeted to fulfill the SCMPr 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. (SCMPr Staff, NYC DEP, PAC)**
 - **SMIP grant round 2017-2018 – Received 14 formal applications pending DCSWCD district board approval**
 - **Continue an open enrollment for Local Flood Analysis projects**
- 2. Maintain information on the status of awarded grants and future grant rounds through the Catskillstreams.org website (SCMPr Staff, NYC DEP)**
- 3. Regularly prepare and distribute press releases on the accomplishments of the recipients of SMIP grants. (SCMPr 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.**
- 6. Award additional grants in 2019**

SMIP grants to be completed in 2018-2019 are listed below:

Education and Outreach						
<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>
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>
Highway/Infrastructure						
<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>
Little Delaware Streambank stabilization	Town of Bovina	Streambank stabilization to protect community septic field and Cty Rt 6	700	November 2017	\$138,672.50	Completed
Medium Hydraulic Structure Study	DCDPW	Identify & prioritize replacement of structures 5-20 ft to improve stream conveyance.	--	November 2018	\$197,996	In-process
Odell Lake Road Culvert Replacement	Town of Harpersfield	Replace undersize culvert with 3-sided bridge	120	November 2018	\$182,620	Design Phase
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>
Flood Hazard Mitigation						
<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>
Local Flood Hazard Mitigation Analysis	Village of Fleischmanns	LFA plan for the Village of Fleischmanns and Hamlet of Clovesville	--	July 2016	\$77,250	Completed
Local Flood Hazard Mitigation Analysis	Town of Middletown	LFA plan for the Hamlet of Arkville	--	May 2017	\$92,500	Completed

SMIP grants to be completed in 2018-2019 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>
Village of Delhi River Walk Design Phase II	Village of Delhi	Build the river walk that was designed in 2015	--	November 2018	\$60,534.24	In-process
Highway/Infrastructure						
<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>
County Rt. 22 East Brook	DPW	Streambank stabilization along steep embankment to protect County Road	250	November 2018	\$285,522	Hired engineer consultant
Stockton Ave/South St.	Village of Walton	Streambank stabilization to protect utility infrastructure	500	November 2019	\$398,545	Hired engineer consultant
Miller Ave. Culvert Replacement	Town of Bovina	Replace culvert & installing step pools for fish passage	100	November 2018	\$268,188.55	10% Design
East Brook Streambank Stabilization	Town of Hamden	Streambank stabilization along steep embankment to protect town road	220	November 2018	\$66,366.60	30% Design
Beers Brook Streambed Stabilization	Town of Walton	Stabilize the streambed from headcut to protect town road	160	November 2018	\$31,645.24	60% Design
Town Brook Stream Restoration	Town of Stamford	Stream channel and riparian buffer restoration	400	November 2018	\$31,527.58	30% Design
Grant Brook Streambank Repair	Village of Hobart	Repair a failing hand laid stonewall	60	November 2018	\$22,910.75	10% Design
Bull Run Stream Embankment Stabilization	Town of Middletown	Streambank restoration on steep embankment with fine sediment source resulting in turbidity	100	November 2019	\$350,000	Hired engineer consultant
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.	--	2018	\$30,000	In-process
John Tuttle Culvert Replacement	Town of Middletown	Engineer design for culvert replacement.	--	2018	\$30,000	In-process
Flood Hazard Mitigation						
<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>
Local Flood Hazard Mitigation Analysis	Arkville	LFA plan for Hamlet of Arkville	--	May 2017	\$58,000	Completed
Local Flood Hazard Mitigation Analysis	Walton Tributaries	LFA plan for Village of Walton on East, West & Third Brook	--	January 2018	\$119,415	Completed
Local Flood Hazard Mitigation Analysis	Town of Hamden	LFA plan for Hamlet of Hamden	--	December 2017	\$70,000	Completed
Local Flood Hazard Mitigation Analysis	Town of Andes	LFA plan for Hamlet of Andes	--	April 2018	\$79,758	Public hearing & adoption
Local Flood Hazard Mitigation Analysis	Village of Delhi	LFA plan for Steele Brook, West Branch Delaware River, Elk Creek & Platner Brook	--	January 2018	\$96,758	Completed
Water Street Floodplain Reclamation Project	Town & Village of Walton	Floodplain restoration & stormwater mitigation in the Village of Walton	--	December 2018	\$630,760	90% Design

SMIP grant funds are offered to stakeholders to implement recommendations of the stream management plans and to further the evolving priorities of DCSWCD, NYCDEP 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 Floodplain Reclamation projects in collaboration with Municipalities. These projects will be identified in the Local Flood Analysis plans. (SCMPr Staff)**
- 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, NYC DEP)**
- 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, NYC DEP)**
- 3. Continue to work with West Branch flood commissions, municipalities and stakeholder groups on improving recreation access on the West Branch Delaware River (DCPD, SCMPr staff, NYCDEP)**
- 4. Continue to provide technical assistance to the flood commissions, municipalities and stakeholder groups for recreational opportunities (ie 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, SCMPr staff, NYC DEP)**
- 2. Work with the Delaware County Chamber of Commerce, Central Catskills Chamber of Commerce, and the Recreation and Fisheries sub-committees to promote recreational fishing in the Cannonsville and Pepacton Reservoirs and support the new boating program through outreach promotional activities such as sponsored fishing days, boating safety and fishing safety courses, etc. (SCMPr Staff, DCPD, NYC 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 (SCMPr Staff, DCPD, NYC DEP, PAC)**
 - a. Work with Trout Unlimited to plant trees in the riparian buffer with volunteer groups and schools.**

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 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 SCMPr Coordinator)**
- 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 Plan (LFHMP) by the implementation of the All-Hazards Mitigation Plan. (SCMPr 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, NYC DEP Project Manager, NYSDEC, SCMPr Staff)**
- 6. Provide scholarship for training opportunity for Certified Floodplain Managers (CFM) and Code Enforcement credits**
- 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, NYC DEP)**
- 12. Provide funds for the Local Flood Analysis process and recommended flood hazard mitigation stream projects through the SMIP.**
- 13. Work with the following Flood Commissions to Implement the LFA plan recommendations:**
 - **Walton Flood Commission**
 - i. **West Branch Delaware River Tributaries (East Brook, West Brook, Third Brook)**
 - **East Branch Delaware Flood Commission including:**
 - i. **Fleischmanns**
 - ii. **Middletown**
 - iii. **Clovesville**
 - iv. **Arkville**
 - **Delhi Flood Commission**
 - **Hamden Flood Commission**
 - **Andes Flood Commission**
- 14. Complete work with the following Flood Commissions with the LFA process:**
 - **Roxbury Flood Commission**

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 compliment 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 2018 – 2019 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 NYC DEP. (DCSWCD CSBI Coordinator, NYC DEP CSBI Coordinator)**
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, NYC DEP CSBI Coordinator)**
3. **Development of a minimum of 10 Riparian Corridor Management Plans (RCMP) per year. (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).**

CSBI Riparian Corridor Management Plans/ Planting Projects				
<u>Project Title</u>	<u>Location</u>	<u>Length (feet)</u>	<u>Scheduled for Completion</u>	<u>Status</u>
East Platner Brook Knotweed Control & Planting	Town of Delhi	500	Fall 2017	Complete
Chambers Hollow Riparian Planting and Knotweed control	Town of Hamden	630	Ongoing 2017 - 2019	Planting complete May 2017
Kelly's Kayaks Riparian Restoration Student Planting	Margaretville	670	Spring 2017	Complete
Trout Unlimited Volunteer Planting – East Branch Delaware River (Hubbell)	Town of Middletown	1825	Completed May 2017	Complete
Margaretville Pavilion 3 rd Grade Planting	Village of Margaretville	180	April 2017	Complete
Tributary to Little Delaware Knotweed Treatment-Addendum	Town of Delhi	715	Fall 2017	Complete
Bussey Hollow Knotweed Control	Town of Andes	335	Ongoing 2016 – 2019	Year 2 Complete
Mead Road Knotweed Control	New Kingston	560	Ongoing 2016 – 2019	Year 2 Complete
Kelly's Kayaks Knotweed Control	Halcottsville	370	Ongoing 2016 – 2019	Year 2 Complete
Depot Street Knotweed Control	Fleischmanns	110	Ongoing 2017 – 2019	Year 1 Complete
Ballantine Park Knotweed Control	Town of Andes	2100	Ongoing 2016 – 2019	Year 2 Complete
Beech Hill Knotweed Treatment	Town of Andes	1300	2013-2017	Complete
Vly Creek Restoration-Brush Ridge Associates	Village of Fleischmanns	900	2018	In Planning
Beech Hill Post Knotweed control planting	Town of Andes	1300	2018	In Planning
Willow Drive Stabilization	Arkville	400	2019	In planning
Old Herrick Road Riparian Plantings	Town of Middletown	1300	2018	In planning
Batavia Kill Riparian Restoration	Town of Roxbury	250	Fall 2018	In Planning
Bryant's Brook Stabilization	Town of Andes	250	2019	In Planning

5. Implement 1 demonstration or educational Riparian Corridor Management Plan per year. (DCSWCD CSBI Coordinator)
- Educational RCMP implementation:
 - Conduct a volunteer planting educational workshops with community groups and local student.
 - Conduct a volunteer potting-up educational workshop with local high schools students, SUNY Delhi college students and BOCES students.

CSBI Student/Educational Projects			
<u>Project Title</u>	<u>Location</u>	<u>Scheduled for Completion</u>	<u>Project Type</u>
Margaretville Pavilion 3 rd Grade Planting	Village of Margaretville	April 2017	Student Planting
Presentation to 6 th Grade Science Classes	Margaretville Central School	May 2017	Presentation
Presentation to 6 th Grade Science Classes	Roxbury Central School	May 2017	Presentation
Trout Unlimited Volunteer Planting – East Branch Delaware River (Hubbell)	Town of Middletown	May 2017	Volunteer Planting
Trees for Trout - East Branch Delaware River Planting	Halcottsville	October 2017	Volunteer Planting
GreenNY Student Planting (NY City Students)	SUNY Delhi OEC; Town of Delhi	May 2018	Student Planting
Kelly Kayaks Riparian Planting Maintenance-Trout Unlimited Ashokan-Pepacton Chapter	Halcottsville	April 2018	Volunteer Planting
DCMO-BOCES Student Plantings	Various Locations	Seasonally 2018-2019	Student Plantings
Margaretville Central School Student Plantings	Town of Middletown – East Branch Delaware	Ongoing 2017 – 2019	Student plantings
SUNY Delhi Outdoor Education Center Spring & Fall Plantings (SUNY Delhi Students)	Town of Delhi	Ongoing 2017 – 2019	Student Planting
Potting-Up Activity – DCMO BOCES	DCSWCD, Walton	Spring Yearly 2017-2019	Student Workshop

6. 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, web site 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 2018-2019
Walton 4H Outreach events	Village of Walton	Annually
Riparian Walk/Workshop – Pavilion Park	Village of Margaretville	July 2017
Forestry Festival – Stream Table / Riparian Buffer Display	Village of Margaretville	Annually
Cauliflower Festival – Stream Table / Riparian Buffer Display	Village of Margaretville	Annually
Delaware County Fair	Town of Walton	Annually

7. Secure landowner license and maintenance agreements for long-term access by DCSWCD and NYCDEP to facilitate ongoing maintenance and monitoring. (DCSWCD CSBI Coordinator)
8. Develop planting plans as requested for applicable stream program projects in coordination with stream program staff. (DCSWCD SCMP Staff and DCSWCD CSBI Coordinator)
9. Develop and implement a monitoring program for riparian buffer projects to identify project success and effectiveness. (DCSWCD CSBI Coordinator, NYC 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>
2015	33
2016	23
2017	26
2018	19
2019	24

- b. Monitoring protocol was developed for invasive species monitoring of CSBI planting project locations.
10. 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.

11. 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 initiate a process defining eligible sites and for implementing variable width buffers. (DCSWCD CSBI Coordinator, NYC DEP CSBI Coordinator with NYC DEP, DCSWCD SCMPPr staff)
2. Identify potential sites for demonstration of a variable width riparian buffer pilot project. Implement one demonstration project. (SCMPPr Staff, DEP Staff, WAP Staff)
 - a. Produced planting and riparian buffer plan for the More Stream Restoration Project in the Town of Hamden along the West Branch of the Delaware River. The reach is approximately 1000 linear feet and construction was completed in 2016.

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

1. Execute an updated shared services agreement with the WAC to provide CSBI funding to hire a Planner (“WAS Planner”) or provide CSBI funding for existing WAC Planners to complete tasks for the duration of the Pilot Program. Provide CSBI funding to serve as the local match needed to implement CREP on fallow lands.
2. Develop a 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)
3. 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)
4. 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)
5. Provide CSBI cost-share funding to the Watershed Agricultural Council to facilitate fallow land CREP enrollment. (SCMPPr Coordinator, SCMPPr Staff, NYC DEP Project Manager)
6. Monitor and evaluate the success of the CREP-CSBI projects. (SCMPPr Staff)
7. Develop a set of evaluation metrics and report to assess the effectiveness of the Pilot Program (CREP-CSBI Pilot Program Working Group)
8. The CREP-CSBI Pilot Program Working Group shall include: SCMPPr Coordinator, SCMPPr PE, NYC DEP Project Manager, WAC Program Managers and Planner(s), DCSWCD and DEP CSBI Coordinators, NRCS.

D. Invasive Species Management Action Items

1. Continue to work collaboratively with Delaware County Solid Waste Facility to compost Japanese Knotweed. (SCMPr 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>
Walton Knotweed Pull-Delaware Ave – Walton 4H	Village of Walton	Ongoing 2017 - 2019
Chambers Hollow Knotweed Control	Town of Hamden	Ongoing 2017 - 2019
Bussey Hollow Knotweed Control	Town of Andes	Ongoing 2017 - 2019
Mead Road Knotweed Control	New Kingston	Ongoing 2017 - 2019
Kelly’s Kayaks Knotweed Control	Halcottsville	Ongoing 2017 - 2019
Depot Street Knotweed Control	Fleischmanns	Ongoing 2017 - 2019
Ballantine Park Knotweed Control	Town of Andes	Ongoing 2017 - 2019

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

4. Demonstration Project Funding

Demonstration 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, NYC DEP Project Manager, DCDPW)**
2. **Design and implement two demonstration projects that utilize the woody debris protocol developed by the SCMPr. (SCMPr Staff)**
3. **Undertake a periodic review of the woody debris protocol developed by the SCMPr. (SCMPr Staff, NYC 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 that was 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. **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)**
3. **Implement 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)**
4. **Design and implement two demonstration projects that utilize the existing gravel management protocol developed by the SCMPr. (SCMPr 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 steam channel to the proper width and depth for approximately 100 linear feet whenever the stream capacity is compromised with gravel.**

5. Undertake a periodic review of the gravel maintenance protocol developed by the SCMP. (SCMP Staff, NYC DEP Staff)

C. Utilize Existing Funding Sources Action Items

1. Continue to explore opportunities for utilizing grant funding sources to match SCMP funds for implement recommendations. (DCSWCD SCMP Coordinator)
 - a. NYS DEC Water Quality Improvement Project (WQIP)
 - i. Miller Avenue Culvert Replacement Project in the Town of Bovina
 - ii. South Street Streambank Stabilization Project in the Town of Walton
 - b. Army Corps of Engineer's Water Resources Development Act (WRDA)
 - i. Water Street Floodplain Reclamation In the Town of Walton
 - ii. Odell Lake Road Culvert Replacement in the Town of Harpersfield
 - iii. Close Hollow Road Streambank Stabilization in the Town of Andes
 - iv. Hardscrabble Streambank Stabilization in the Town of Roxbury
 - v. Bull Run Stream Slope Stabilization in the Town of Middletown
2. Train staff and others within the watershed on how to prepare grant applications for obtaining additional funds for matching SCMP funds.

D. Demonstration Projects for Construction in 2018 and 2019

1. Water Street Floodplain Restoration, WBDR Walton
 - a. This project is a recommendation from the Local Flood Analysis Plan on the West Branch Delaware River main stem written by a consultant, Milone and Mac Broom Inc., for the Walton Flood Commission. The project consists of reclaiming floodplain 9 ½ acres along Water Street and vegetate the floodplain with grass and riparian shrubs.
 - b. 2018 Status: In the Spring of 2017 an engineer consultant was hired to complete the topographic survey, design and soil testing. The topographic survey and soil testing was completed in late spring. The results from the soil testing determined that there was minor contamination that is not suitable for residential use. Delaware County Soil and Water Conservation District is working with Delaware County Waste Management Facility to develop a Beneficial Use Determination to be approved by New York State Department of Conservation (NYS DEC). Additional soil testing was required by NYS DEC which has delayed the project. Project is expected to be started in the Summer of 2018 with construction phases to meet permit requirement on vegetation coverage. The NYSEG gas lines that was located within the project area have been capped off and relocated.
2. Mill Street Floodplain Restoration, EBDR Fleischmanns
 - a. This project is to complete Phase 2 of the Natural Resource Conservation Service's Emergency Watershed Protection projects that was built in 2013. Reclaiming the floodplain along the right streambank and the removal of Mill Street Bridge was put on hold until the property completed the flood buyout. The project will consist of regrading a bankfull bench that is 3 foot higher than streambed with a slope of minimum 2% towards Vly Creek stream. Place topsoil and vegetate bankfull bench with grass and riparian shrubs and place willow stakes in the joints of rip rap. Rip rap will be placed upstream and downstream of the project to match existing top of bank.

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. (SCMPr 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 SCMPr Coordinator, DCSWCD Executive Director, and DCSWCD Technical Coordinator, NYCDEP 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 SCMPr Staff)
 - a. Complete work on the following CREP streambank stabilization projects
 - i. Laura Phoenix Farm
2018 Status: Barton and Loguidice consultant has been selected to design the project. Survey of the project site is scheduled for early March. Design status is currently at 90% preparing for permitting.
 - ii. Willard Frisbee Farm
2018 Status: Preliminary survey completed.
4. Provide engineering approval, technical support, 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)

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. (SCMPr Coordinator, NYC 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. (SCMPr Coordinator, SCMPr PE, SCMPr technicians, and NYC DEP as needed)
3. Provide design 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. (SCMPr Coordinator, SCMPr PE, SCMPr technicians, and NYC DEP as needed)

4. Continue to provide funding to the Watershed Agricultural Program for stream stabilization projects that facilitate CREP enrollment. (SCMPr Staff)
 5. In cooperation with the Watershed Agricultural Program, evaluate stream instability issues for remediation on existing CREP sites. (SCMPr Coordinator, SCMPr PE, and SCMPr Technicians)
 6. Provide funding to the Watershed Agricultural Program for stream projects that stabilize existing CREP sites. (SCMPr Staff)
 7. Continue to monitor and evaluate the success of the bank stabilization projects. (SCMPr Staff)
- C. Enhance the Implementation of CREP on NYC Watershed Cropland and Explore Long – Term CREP Contracts 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) 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, SCMPPr staff, NYC 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. Coalition of Watershed Towns
 - h. Recreation Access groups (Catskill Foundation and Water Discovery Center)

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, SCMPPr Coordinator)**

C. Participation with the Catskill Watershed Corporation Action Items

- 1. Provide technical assistance as requested for stream related CWC funded projects. (SCMPPr Staff, NYC 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. (SCMPPr 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, NYC 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, SCMPPr Staff, NYC DEP, NYS DEC)**

2. Development opportunity for Municipal Officials to obtain credits for participating in educational activities. (DCPD, SCMP Staff)
3. 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)

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, SCMP Staff, NYC DEP)
2. Provide technical assistance to local municipalities to enhance local laws and local management practices. (PAC, DCPD, SCMP Staff, NYC DEP)

E. Streamline Stream Work Permitting Action Items

1. Work in cooperation with NYS DEC, US Army Corps of Engineers, NYC 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. (SCMP Staff, NYC DEP RRE and SMP staff, US Corps of Engineers, DCDPW, Highway Subcommittee)

F. Provide Technical Assistance to Local Highway Departments Action Items

1. Provide technical assistance and support on the Medium Hydraulic Structure Study SMIP contract to evaluate watershed culverts for hydraulic capacity and prioritize them for upgrade through the SMIP. (DCDPW, SCMP Staff)
2. Provide technical assistance and educational support to municipalities for sizing and the design of routine culvert replacements. (SCMP Staff, DCDPW)
3. Enable municipalities to apply for funding through the SMIP grants for infrastructure projects causing stream instability and/or water quality issues. (SCMP Staff, DCDPW)
4. 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. (SCMP 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. (SCMP 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)

G. Geomorphic Assessments at Bridges and Culverts Action Items:

1. Support the completion of 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)

H. 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)
 - Stream Feature Inventory completed on Steele Brook and tributary to Elk Creek.
3. Perform stream assessment and monitoring using a drone. (SCMPr Staff)

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

1. Adoption completed for the following:

Towns:

Andes
Bovina
Deposit
Franklin
Halcott
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, NYCDEP)
 4. Encourage municipalities to continue to participate in the PAC and Sub-committees. (SCMPr Staff, NYC DEP, DCPD)
- J. Develop a Process for Updating the East and West Branch Delaware River Stream Corridor Management Plan Action Items**
1. Work with the Project Advisory Committee and it's Sub-Committees to initiate a comprehensive review of the East and West Branch Delaware River Stream Corridor Management Plan and initiate a process to update the plan as required. (PAC, DCPD, SCMPr Staff, DEP staff)
- K. Expand Public Education and Outreach Efforts Action Items**
1. Fund and implement education and outreach activities identified and prioritized by the Project Advisory Committee Education and Outreach sub-committee. (PAC, SCMPr Staff)
 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, NYCDEP, CWC)
 4. Work with 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, NYCDEP, CWC, BOCES and area schools)
 5. 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 NYCDEP)
 6. Provide up-to-date information to the catskillstreams.org website as well as support for the revision and maintenance of the Catskill Streams website.
 7. Participate in the West-of-Hudson watershed-wide education and outreach efforts.

8. **Maintain an up-to-date project status and education outreach information on the DCSWCD website.**

L. 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, NYC 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)**