

**New York City Department of Environmental Protection
Bureau of Water Supply**

**Stream Management Program
Second Evaluation of the CREP/CSBI Pilot Program**

November 2021

*Prepared in accordance with Section 4.6 of the NYSDOH
2017 Filtration Avoidance Determination*



Prepared by: DEP, Bureau of Water Supply

Summary

The 2017 Filtration Avoidance Determination (FAD) requires the New York City Department of Environmental Protection (DEP) to establish a partnership between the City-funded Catskill Streams Buffer Initiative (CSBI) and the federal Conservation Reserve Enhancement Program (CREP) to plant riparian buffers on fallow agricultural lands in the West of Hudson (WOH) Watershed. Within Delaware County, the FAD directed DEP to fund a pilot program administered by the Delaware County Soil and Water Conservation District (DCSWCD) and Watershed Agricultural Council (WAC); establish metrics to evaluate the effectiveness of the pilot program; review progress in extending CREP/CSBI throughout the WOH Watershed; and recommend either establishment of a permanent program or discontinuation of the program.

In November 2019, DEP submitted an initial evaluation report recommending a two-year extension of the pilot program, with a second evaluation report to be submitted by November 30, 2021. The New York State Department of Health (NYSDOH) approved the extension of the pilot program. This second evaluation report updates the progress in extending CREP/CSBI to eligible fallow agricultural lands in Delaware County and across the WOH Watershed. Evaluation of the pilot program is broken into Phase 1, which encompasses the original two-year period November 2017 to November 2019, and Phase 2, representing updates which have occurred since DEP submitted the first evaluation report (November 2019 to November 2021).

The COVID-19 global health pandemic, along with state and federal program pauses, resulted in several delays to project planning, scheduling, and implementation during Phase 2, which limited the overall number of projects. Phase 1 resulted in four CREP/CSBI plantings, while Phase 2 resulted in two plantings on sites that raised valuable programmatic questions for potential future consideration. DEP believes that a robust evaluation of the pilot program will require additional projects and data points in relation to program metrics before deciding on a future direction. Therefore, DEP recommends extending the CREP/CSBI pilot program four more years, followed by a third evaluation report to be submitted in November 2025 that will recommend either establishment of a permanent partnership or a discontinuation of the program.

Program Background

The New York City Watershed CREP is a federally funded program administered by the USDA Farm Service Agency (FSA) in partnership with the City and New York State pursuant to a memorandum of agreement signed in 1998. CREP provides farmers with enhanced financial incentives to conserve highly erodible agricultural lands and establish riparian buffers through tree and shrub plantings. In the WOH Watershed, CREP is implemented through the City-funded Watershed Agricultural Program in partnership with the USDA FSA and Natural Resources Conservation Service (NRCS), WAC, DCSWCD, and Cornell Cooperative Extension (CCE). DEP provides the local funding match to implement CREP practices that establish riparian buffers on participating farms. As of November 2021, there were 129 active CREP contracts covering 1,345.6 acres of riparian buffers on retired agricultural lands in the WOH Watershed.

CSBI is a component of DEP's Stream Management Program (SMP) that was developed in 2009 pursuant to the 2007 FAD. CSBI offers a CREP-like program for non-agricultural properties, thereby addressing an identified gap in riparian buffer programming. CSBI is funded exclusively by DEP through its core SMP contracts with SWCDs in Delaware, Greene, Sullivan, and Ulster counties; thus, DEP funds a CSBI Coordinator position in each of the SMP basins (Cannonsville/Pepacton, Schoharie, Rondout/Neversink, and Ashokan) who works directly with riparian landowners to identify and implement CSBI projects. By the end of 2020, CSBI had completed 248 planting projects spanning 159.3 acres (22.1 stream miles).

In 2016, a New York State FSA policy amendment enabled fallow agricultural properties to participate in CREP if they meet eligibility criteria. Following this rule change, DCSWCD and WAC proposed integrating components of CREP and CSBI to help accelerate riparian buffer implementation. WAC hired a dedicated CREP/CSBI Planner to solicit landowners, prioritize basins for project implementation, and work with the DCSWCD CSBI Coordinator towards the initial goal of planting 20-25 acres of riparian buffers.

The 2017 FAD also requires DEP to work with SMP partners in the Ashokan, Schoharie, and Rondout/Neversink basins to offer CREP as an option to landowners within the existing framework of CSBI. While all SMP partners took the same basic approach to identifying eligible parcels and soliciting landowners, the primary differences include:

- 1) In Delaware County, WAC hired a full-time CREP/CSBI Planner (funded by DEP) to facilitate the pilot, in addition to utilizing the DCSWCD CSBI Coordinator and local USDA staff, including a dedicated NRCS CREP Planner; other SMP partners relied on existing staff, primarily the local CSBI Coordinator position.
- 2) In Delaware County, WAC and DCSWCD used a two-step mail survey approach to assess and solicit landowner interest in CREP/CSBI projects; other SMP partners mailed an informational letter or postcard that offered site visits.
- 3) In Delaware County, WAC and DCSWCD used a GIS-based analysis to identify potentially eligible properties having at least 0.5 acres of plantable area; other SMP partners used one acre of plantable area as the eligibility threshold.

By November 2019, 20.3 acres had been planted across four CREP/CSBI projects in Delaware County, while no projects were implemented in other counties. At that time, DEP recommended extending the pilot program to further demonstrate whether 6-10 landowners will enroll annually in Delaware County, and whether a dedicated CREP/CSBI Planner will enhance the number of revegetation projects above the CSBI base program average, which is typically five new projects each year.

Context for Phase 2 Evaluation

During Phase 2, the CREP/CSBI pilot program experienced several setbacks and delays related to COVID-19 and changes to how federal CREP incentive payments are administered in the watershed. Pandemic-related financial measures in the City of New York coincided with the planned start of DEP's new SMP contract with DCSWCD, which was expected to register by July 1, 2020 but was delayed by two months. Since federal CREP contracts need to be finalized

and signed by late summer/early fall, the City’s delay in contract registration prevented DCSWCD from implementing any CREP/CSBI projects in 2020.

Also during 2020, the USDA conducted a review of the NYC Watershed CREP and determined they had overpaid rental payments on about 160 CREP contracts (covering about 1,590 acres) by approximately \$9.60 per acre per year¹. The FSA notified impacted landowners in September 2020 and offered them the following options: (1) accept a reduction in payments going forward, (2) appeal the decision to FSA, or (3) terminate their CREP contracts without penalty. Approximately two-thirds accepted the reduction in payment, approximately one-quarter terminated their CREP contracts, and a handful of landowners appealed the decision.

In 2021, the federal incentive rate was changed again based on the USDA’s re-evaluation nationwide of CREP soil rental rates. This 2021 change effectively offset the 2020 rate reduction for new CREP contracts by increasing the soil rental rates. Lingering uncertainty regarding the stability of federal incentives combined with the recent experience of having to change or cancel previously established contracts may affect future interest by watershed landowners.

Delaware County Pilot Program

Since 2017, the Delaware County pilot program has installed a cumulative total of six CREP/CSBI projects at a total implementation cost of \$233,993. These projects account for nearly 38 acres of riparian plantings, of which approximately 23 acres enrolled in CREP, with a federal cost-share of \$49,756 applied to the cost of the plantings. Table 1 summarizes the six Delaware County projects completed during both phases of the CREP/CSBI pilot program thus far. It should be noted that final Phase 2 project size and cost information still need to be confirmed with final invoices and project reports, which are not yet available.

Table 1. Delaware County CREP/CSBI Pilot Program Implementation Summary for Phase 1 (November 2017 to November 2019) and Phase 2 (November 2019 to November 2021).

Landowner	CREP/CSBI length (ft)	CSBI-only length (ft)	CREP/CSBI acres	CSBI-only acres	USDA funds	DEP funds
1	2,500	0	4.94	0	\$8,070	\$10,090
2	2,500	0	5.10	6.96	\$7,773	\$33,858
3	1,600	460	1.34	0.42	\$1,551	\$15,043
4	775	1,050	0.61	0.97	\$954	\$9,715
Sub-total (Phase 1)	7,375	1,510	11.99	8.35	\$18,347	\$68,706
5	2,850	700	6.65	5.48	\$18,764	\$69,212
6	1,560	0	4.48	0.89	\$12,645	\$46,319
Sub-total (Phase 2)	4,410	700	11.13	6.37	\$31,409	\$115,531
Grand Total (Phase 1+2)	11,785	2,210	23.12	14.72	\$49,756	\$184,237

¹ Based on estimates provided by the USDA FSA at the time, DEP reported 172 CREP contracts covering 1,687.4 acres in its March 2021 Watershed Protection Program Summary and Assessment Report; those estimates have since been refined as the USDA FSA continues to update its CREP re-enrollment data following the federal rate changes.

During Phase 1, a total of 20.3 acres were planted across four projects (8,885 feet = 1.7 miles), with approximately 12 acres enrolled in CREP and a federal cost-share of \$18,347 applied to those plantings; it should be noted that one Phase I project (Landowner #4) cancelled his CREP contract during Phase 2 due to federal rental rate changes.

Phase 2 resulted in 17.5 additional acres from two large planting projects (13,295 feet = 2.5 miles); both of these projects were wider and more expansive than the Phase 1 projects, with nearly double the buffer area to stream length ratio. Within these projects, approximately 11.1 acres were enrolled in CREP, with a federal planting cost-share of \$31,409. One Phase 2 project (Landowner #6) also included a pre-planting site restoration component, which involved the removal of debris and old farm equipment from the planting area; site restoration for this project cost an additional \$13,745, which is included in the \$46,319 attributed to DEP funds and represents 23% of total federal and City implementation costs for this particular project. Since CSBI does not have an explicit policy to address pre-planting site restoration, debris removal on project sites is discussed below as part of this Phase 2 evaluation.

The notable increase in cost per acre for the Phase 2 projects (approximately \$8,400 per acre, as compared to approximately \$4,280 per acre in Phase 1) can be attributed to several reasons, including new project elements (e.g., pre-planting site restoration added for Landowner #6); increased plant material quality and associated costs (Phase 2 used more containerized plants versus bare-root stock in Phase 1); COVID-19-related material cost increases; and the USDA increasing the allowable cost per acre cap for CREP plantings.

Impact of federal CREP incentive payments during Phase 2

When the first four CREP/CSBI contracts were signed in 2019, the combined annual federal incentive payment (“rent”) for CREP plantings in Delaware County was \$107.60 per acre. This rate was comprised of the base soil rental rate for marginal pastureland (MPL) in Delaware County (equal to \$48 per acre), plus an added NYC Watershed incentive payment of \$57.60 per acre (equal to 120% of the MPL), plus a buffer maintenance rate of \$2 per acre.

In 2020, the federal government decided to reduce the NYC Watershed incentive payment, which had been in place for nearly 20 years prior, from 120% of the MPL down to 100% of the MPL. This decision effectively reduced the added incentive rate for CREP parcels in Delaware County from \$57.60 per acre down to \$48 per acre, for an overall annual rate reduction of \$9.60 per acre (a total federal incentive payment of \$98 per acre). As previously noted, landowners were given the choice to either accept the lower rate for their contracts going forward, cancel their contracts, or appeal the rate reduction decision. Of the four original CREP/CSBI pilot projects, two landowners accepted the lower rate, one landowner cancelled his CREP contract in 2020, and one landowner won his appeal, thereby maintaining the higher rate.

In 2021, the federal incentive rate was changed again after the USDA re-evaluated nationwide soil rental rates for the CREP program. For Delaware County, the MPL rate was increased from \$48 per acre up to \$53 per acre. Adding the NYC Watershed incentive (\$53 per acre) plus the \$2 per acre buffer maintenance rate, the total annual incentive rate for the Phase 2

pilot projects amount to \$108 per acre. Table 2 presents a summary of the federal incentive rate changes for the Delaware County CREP/CSBI pilot projects for the past three years.

Table 2. Annual federal CREP incentive rates for Delaware County CREP/CSBI projects.

	2019	2020	2021
MPL Soil Rental Rate	\$48.00/acre	\$48.00/acre	\$53.00/acre
NYC Watershed Incentive	\$57.60/acre (120% of MPL)	\$48.00/acre (100% of MPL)	\$53.00/acre (100% of MPL)
Buffer Maintenance	\$2.00/acre	\$2.00/acre	\$2.00/acre
Total Annual Payment:	\$107.60/acre	\$98.00/acre	\$108.00/acre

Both landowners that completed CREP/CSBI projects during Phase 2 are expected to receive their first CREP incentive payments in October 2022 at the new annual rate of \$108 per acre. Table 3 summarizes the history of federal CREP incentive payments for the six landowners that implemented projects during Phase 1 and Phase 2 of the CREP/CSBI pilot program. As described above with respect to federal rate changes enacted in 2020, two landowners (#1 and #3) accepted the new 2020 rate, which locked them into that lower rate for future incentive payments. Landowner #2 appealed the 2020 rate change and won, thereby maintaining the 2019 rate. Landowner #4 cancelled his contract due to the 2020 rate change.

Table 3. Annual Delaware County CREP Incentive Payments for Phase 1 (November 2017 to November 2019) and Phase 2 (November 2019 to November 2021).

Landowner	2019	2020	2021	2022 (Expected)
1	\$530	\$483	\$483	\$483
2	\$547	\$547	\$547	\$547
3	\$144	\$131	\$131	\$131
4	\$65	Cancelled	--	--
Sub-total (Phase 1)	\$1,286	\$1,188	\$1,188	\$1,188
5	n/a	n/a	n/a	\$720
6	n/a	n/a	n/a	\$483
Sub-total (Phase 2)	n/a	n/a	n/a	\$1,203
Grand Total (Phase 1+2)	\$1,286	\$1,188	\$1,188	\$2,391

Debris Cleanup on CREP/CSBI Projects

Federal CREP policy requires a clean and plantable site as a prerequisite for any planting installation, which can deem certain sites ineligible if they contain large amounts of debris or “farm dumps”. During Phase 2, the flexibility of a CREP/CSBI partnership was explored to address two properties where the presence of debris may have otherwise disqualified these sites from CREP. Both projects contained areas of extensive debris and garbage that needed to be

removed prior to planting. Because the extent and potential for hazardous materials varied between the two sites, DEP recommended different approaches to manage the debris areas for each project as preparation for riparian planting; these approaches warrant further evaluation.

At the West Terry Clove project site (Landowner #6), debris was spread across 5.4-acres and largely consisted of old farm equipment, scrap metal and plastic-wrapped hay bales. DEP and DCSWCD determined this debris to be largely surficial and nonhazardous, and it was removed via excavator in the months prior to planting. Debris from the property filled two roll-off dumpsters and cost \$13,745 for removal and disposal, which was funded by CSBI and represents 23% of total federal and City implementation costs for this project.

At the Winter Hollow project site (Landowner #5), two areas covering 0.8 acres included more significant and potentially hazardous debris, including several small structures (two deteriorated sheds and what appeared to be an old outhouse) and a dilapidated trailer filled with garbage. To ensure Environmental Health and Safety (EHS) compliance, DEP determined that the Winter Hollow project should undergo an environmental site survey to assess whether hazardous material was present, thus requiring a formal cleanup. The timetable for this survey was incompatible with a fall planting, and program partners shared a concern that performing such a survey could potentially expose the landowner or pilot program to liability for a cleanup that had not existed prior. Therefore, to enable the project to proceed, program partners agreed to “cut out” the debris from the CREP-contracted portion of the project area (0.8 acres of the overall 12.9-acre planting area), using the same model undertaken with unstable streambank areas. The debris-containing areas at this property may be addressed in the future if consensus is reached among program partners about a formal debris cleanup policy.

Assessment of Evaluation Metrics

Pursuant to the 2017 FAD, evaluation metrics for the CREP/CSBI pilot program were established by an interagency committee of watershed partners and FAD regulators to achieve two broad goals: (1) determine the level of landowner interest in CREP/CSBI projects and parcel characteristics belonging to interested landowners, and (2) determine the process for CREP/CSBI collaboration. The following is an update of Phase 2 progress for each evaluation metric.

Goal 1: Determine the level of landowner interest in CREP/CSBI partnership projects and characteristics of parcels of interested landowners.

Metric 1.1. Based on remote sensing, the estimated number of potentially eligible acres.

During Phase 1, GIS analyses conducted by WAC and DEP estimated approximately 1,279 acres of land in the WOH Watershed as potentially eligible for the CREP/CSBI program, comprised of 762 acres in Delaware County and 517 acres in other counties. Key eligibility criteria included non-forested fallow agricultural lands within 100 feet of a watercourse. Other limiting conditions were factored into the analyses, including the presence of extensive invasive species, wetlands, and unstable streambanks. WAC screened for parcels at least 0.5 acres in size in Delaware County and DEP increased the minimum eligible parcel size to one acre in the Ashokan, Schoharie, Rondout and Neversink basins.

DEP believes the above estimates are conservative, in part because the GIS analysis assumed a uniform buffer width of 100 feet, the maximum eligible under CREP. However, buffers can range from 35 feet (the minimum width under CREP) to several hundred feet when the CSBI plantings are added. DCSWCD and WAC are currently re-running their analysis for Delaware County to refine their initial estimate.

Metric 1.2. Based on remote sensing and the landowner survey, the estimated number and range of acres of interested landowners.

During Phase 1, DCSWCD and WAC used a two-step survey approach to identify 46 landowners owning a combined 90.9 acres as potentially eligible for the Delaware County pilot program. DCSWCD believes that the number of interested landowners was undercounted for a number of reasons, including changes in ownership, limitations of mail solicitation, and initial survey respondents that may have changed their minds over time.

During Phase 2, additional Delaware County landowners that were not part of the original survey pool expressed interest in the pilot, increasing the amount of potentially eligible property with interested landowners to an estimated total of 122.6 acres (note: some of these properties will require a post-COVID site visit to confirm eligibility). DCSWCD and WAC are currently conducting a third round of targeted outreach to landowners who have expressed interest but were missed in the first two rounds of surveys, as well as those who previously indicated interest but lacked contact information. The results of this third round of landowner outreach will be used to update the number of potentially eligible properties, which is expected to increase as staff continue to find more sites that fit the eligibility criteria through updated GIS screenings.

Metric 1.3. Prioritize and select potential areas based on sub-basin, proximity to current/legacy farms, soil loss/erosion potential, etc., as identified from landowner survey.

During Phase 1, WAC and DCSWCD prioritized 24 sub-basins within Delaware County based on the relative amount of non-forested buffer land, the proportion of agricultural buffer land, and plantable buffer area within 100 feet of water. Through that process, the top six sub-basins (all located within the Cannonsville basin) were: East Brook, Beers Brook, Upper Little Delaware, Platner Brook, Mallory Brook and Bagley Brook. Figure 1 depicts the final sub-basin prioritization for CREP/CSBI projects in Delaware County.

DCSWCD and WAC are currently working to further prioritize areas within the prioritized sub-basins, based on potential buffer size, proximity to current/legacy farms, the number of upstream animal units and soil loss/erosion potential. This intra-sub-basin data has been compiled for East Brook and Mallory Brook, and the process tested in East Brook where preliminary results for prioritization of sites have corresponded to high priority sites previously selected and planted by the pilot program.

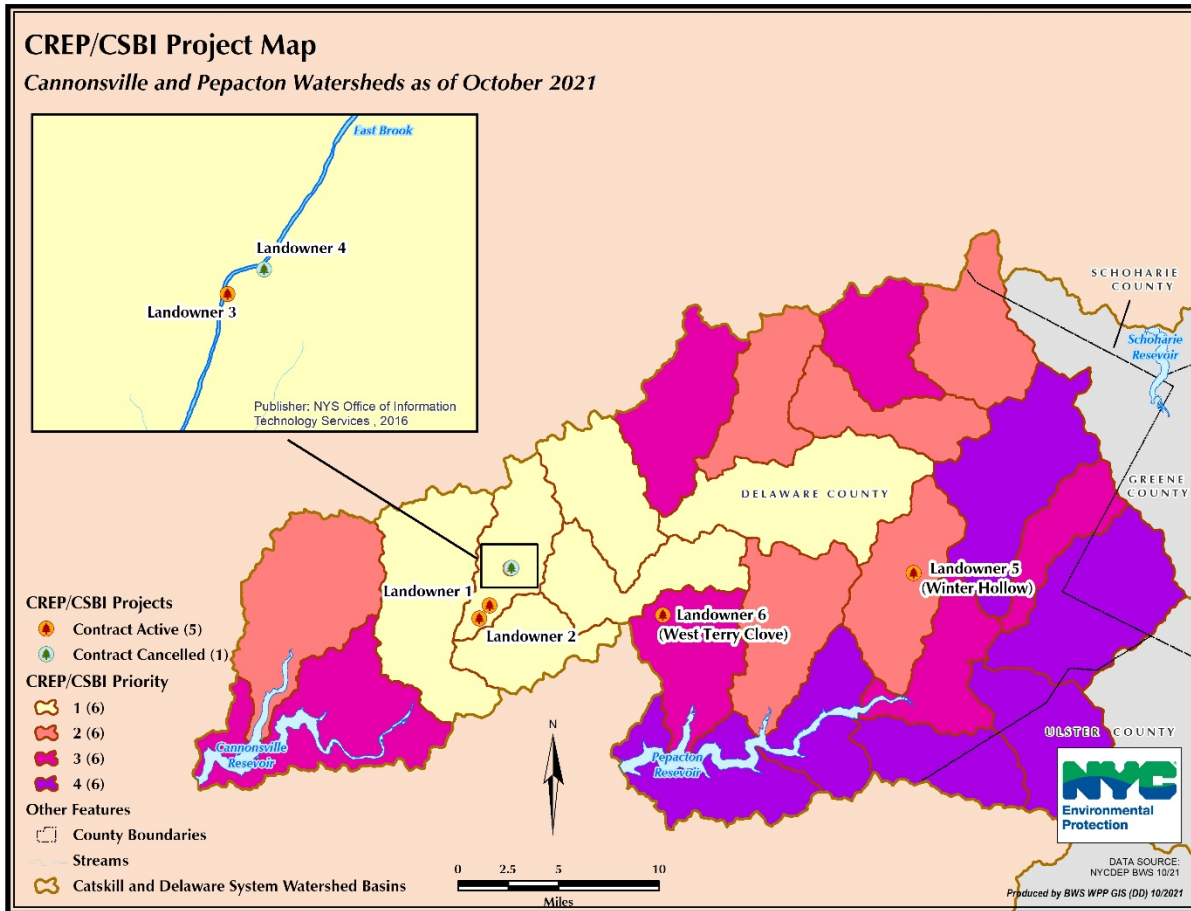


Figure 1. CREP/CSBI project locations with sub-basin prioritization.

Metric 1.4. For the landowners selected in high priority areas, the estimated area or linear feet of instability and invasive species present.

This metric fine tunes the estimates of potentially eligible acreage for CREP/CSBI planting projects based on the likelihood they may require additional time or resources such as streambank stabilization or extensive invasive species mitigation. During Phase 1, this level of analysis had not been fully implemented. During Phase 2, WAC and DCSWCD have begun applying these additional criteria to selected Delaware County parcels, including three properties with significant bank erosion located in the top-priority East Brook sub-basin:

- At a Phase 1 property, areas of significant bank instability were previously noted and subsequently addressed in a 2021 stream restoration project that was completed by DCSWCD under its DEP SMP contract and stabilized 760 linear feet of East Brook. A subsequent 1.5-acre CSBI planting, scheduled for the spring of 2022, will proceed along the restored reach and supplement the 2019 CREP/CSBI project by linking the previously planted riparian buffers located upstream and downstream.
- Two other properties comprising 1,290 linear feet of East Brook have been identified for potential stream restoration prior to enrollment in the CREP/CSBI program.

Thus far, invasive species have been managed under the CREP/CSBI partnership through site preparation and maintenance, primarily with mechanical removal and/or herbicides. It is worth noting several challenges related to invasive species control on CREP/CSBI projects. To be effective, control is often completed over multiple years. Ideally, control of invasive species could be achieved during the timeframe that plantings are completed and established over the current minimum CREP contract term of 10 years. However, some areas require completion of invasive species control prior to the planting. Future CREP contracts may require control of invasives before contracts can be signed; however, this has not created a conflict to date.

Metric 1.5. For responders of the initial survey who submitted their contact information, a second in-depth survey will be sent out with specific information pertaining to the program. The survey will have a goal of reaching a 45% response rate (approximately 55 individuals). Their responses will be tracked for the purpose of better understanding the obstacles to participation.

DCSWCD and WAC completed this metric during Phase 1 and received a 59% response rate. Respondents were asked to rank six programmatic benefits of the CREP/CSBI program, including: water quality protection, streambank stabilization, stream/wildlife health, invasive species control, practices installed at no cost, and financial incentives. Of these potential benefits, the highest proportion of respondents indicated water quality protection as the most important, while financial incentives were ranked the least important.

DCSWCD and WAC have used the Phase 1 survey results in their outreach to landowners and their planning for Phase 2 projects. DCSWCD and WAC are conducting a third round of targeted outreach to Delaware County landowners in priority sub-basins to identify new landowners that may have been missed during the first two survey rounds, and to gauge continued interest from previously contacted landowners. Responses will be compared to previous survey responses to reassess landowner interest and shifting opinions toward the pilot program.

Metric 1.6. Based on the prioritizing of sub-basins and second survey results, one-to-one contact will be made with at least 15 individuals within the prioritized sub-basins. Different types of outreach can be used depending on the preference of the landowner (phone, email, face-to-face). If there are insufficient landowners in the priority areas, landowners from the survey outside the priority areas can also be contacted. This will track landowners' ultimate decisions on how, or if, they will participate in the program (enroll in CREP/CSBI, CSBI, or not enroll). Information collected from this more in-depth survey, and from subsequent one-on-one conversations will be used to improve future outreach.

The first two rounds of mail surveys that were sent to Delaware County landowners proved useful for establishing initial contact in priority sub-basins and gauging interest in a CREP/CSBI project. DCSWCD and WAC continue to use those surveys in conjunction with their GIS-based prioritization of potential sites to plan future projects. For Phase 2, DCSWCD and WAC are conducting a third round of outreach using a more targeted approach to identify landowners in priority areas which may have been missed by the first two surveys.

The original surveys only indicated whether landowners were conceptually interested in a potential CREP/CSBI project. Evaluating future enrollment potential involves one-on-one

contact to understand program benefits and constraints for each specific property. DCSWCD and WAC have directly contacted a total of 25 landowners to discuss a potential project on their property (16 were contacted during Phase 1; nine were contacted during Phase 2. Toward the end of Phase 1, DCSWCD and WAC paused the process of enrolling additional landowners due to uncertainty in federal CREP incentive payments in the 2020 Farm Bill.

Phase 2 outreach resulted in two CREP/CSBI plantings during 2021, and two additional planned projects expected to be planted in 2022. A fifth project had been planned for 2020 but the landowner chose to forego the CREP portion and implemented the planting solely through the base CSBI program (the final 8.8-acre planting was installed in 2020). That landowner indicated that the CREP incentive payment was not a motivating factor in his decision to plant a riparian buffer and cited the documentation requirements involved in the CREP program as a reason to opt for the CSBI planting. Four other landowners that were contacted for potential Phase 2 projects lost interest during the preliminary planning stages. Two of these landowners cancelled after reaching the RCMP stage, while the other two lost interest after reviewing documentation describing program requirements and time commitments.

Goal 2: Determine the process for CREP/CSBI collaboration.

Metric 2.1. Components of CREP and CSBI programs that were or will be implemented. Of the projects that were completed or are in design, how many projects have or will have: (a) Riparian Corridor Management Plans (RCMPs); (b) increased planting densities through CSBI; (c) increased buffer width/size through CSBI; (d) ongoing invasive species mitigation through CSBI; (e) each type of maintenance and why; (f) what plant sizes are used, and from what sources; and (g) feet of instability addressed. In a narrative summary, potentially with case studies, qualitatively assess which program components worked well together versus which did not.

The Phase 1 evaluation identified where program elements were integrated well and where improved coordination was needed; updates are provided below. As part of the ongoing evaluation of this pilot program, DEP recommends adding a new program element (“debris management/removal”) to the established list of metrics in future evaluation reports. An initial summary is provided below for what is now labeled (h) on the following list of metrics.

- a) Riparian Corridor Management Plans (RCMP). During Phase 1, RCMPs did not serve to facilitate CREP contracts as originally envisioned, and all four landowners received their RCMPs following completion of their projects rather than prior to planting. During Phase 2, RCMPs were completed and shared in advance of both plantings. DEP had envisioned integrating the CSBI’s RCMP with the NRCS Conservation Plan into a single project guide provided to landowners. DEP now accepts that two plans will be used: (1) CREP contracts will include NRCS Conservation Plans that focus on the CREP planting areas only and the NRCS legal requirements; and (2) the RCMP will stand alone as the more detailed landowner guide, overall planting plan, vegetation management recommendations, and site maintenance requirements. DEP is satisfied if RCMPs are provided in advance of (or concurrent with) the NRCS Conservation Plan and the CSBI Coordinator is afforded the opportunity to review and provide input into the Conservation Plan to ensure consistency with the RCMP.

- b) Increased planting densities through CSBI. All four Phase 1 pilot projects received enhanced planting densities using CSBI funding. At that time, CREP cost-shared up to 125 plants per acre based on a maximum allowed plant spacing of 19 feet. CSBI enabled an increased density to 15- and 12-foot spacings, corresponding to 190 and 300 plants per acre, respectively. During Phase 2, a federal rule change altered CREP's approach to planting altogether by shifting from an allowed number of plants per acre (125 at 19 foot spacing) to a total allowable investment from CREP per acre of \$5,512.47. The total allowable investment covers the cost of plants, herbicide needed for site preparation, weed mats and tree tubes, and installation. During Phase 2, the new CREP funding cap allowed the program to install 190 plants at a corresponding 15 foot spacing. Program staff concluded that this density was sufficient because it reduced the labor required for monitoring plant survivability and enabled mowing between the plants as part of maintenance. Further, both landowners preferred the less dense planting. As a result, no CSBI resources were applied to increasing planting density in Phase 2. It is worth noting that CREP's plant spacing guidelines are under review and more detailed guidance may be forthcoming in the future. It is noteworthy that the base CSBI program typically uses a planting density of 8-12 feet for shrubs and 10-12 feet for trees; base CSBI plantings throughout the watershed typically achieve a minimum planting density of 12 feet.
- c) Increased buffer width. The minimum buffer width for eligibility in CREP is 35 feet and the maximum allowable buffer width is 100 feet. During Phase 1, CSBI resources enabled increased buffer widths beyond the CREP minimum of 35 feet on two projects, and beyond the CREP maximum of 100 feet on one project. During Phase 2, CSBI resources were used to expand buffer widths beyond 100 feet on both projects to "smooth" the planting boundary for improved site management and to improve habitat and floodplain functions. One of these projects, in Winter Hollow, demonstrates the detailed planning that can go into a CREP/CSBI project. CSBI was used to expand the CREP-buffered area of 6.7 acres by an additional 5.5 acres over five different planting areas. In four of five planting areas, the 100-foot buffer was extended; in two of these areas, the buffer was extended to protect habitat and floodplain. The landowner actively farms two of four fields and here the buffer smoothed the boundary, whereas in two non-farmed fields the buffer extends to the forest canopy or road.
- d) Ongoing invasive species mitigation. CREP does not fund multi-year invasive species mitigation beyond site preparation and project maintenance (see below). Both Phase 2 projects had minimal invasive species cover with invasives predominantly located within debris-strewn areas. Pre-planting site preparation at a West Terry Clove project addressed invasives using mechanical removal brush-hogging and hand-cutting. In contrast to the Phase 1 sites, no herbicide was used or needed for the site preparation phase of this project. The landowners were trained to identify these species, monitor spread, and remove or treat with herbicide. Program staff will mechanically remove invasives left at the Winter Hollow project following debris removal, if it is addressed in a future cleanup.

- e) Type of maintenance. CREP requires that all plantings receive some form of maintenance at their base (herbicide, weed mats, coir mats) to control herbaceous competition and enhance survivorship. If herbicides are needed for maintenance, CREP requires and funds applications during the first and fourth year after the planting is completed. CSBI funds herbicide treatment if needed during the second and third years. During Phase 2, CSBI funded invasive species maintenance (herbicide application) on all four Phase 1 projects, with additional treatments planned through the fifth year post planting (spring 2023). Both Phase 2 plantings will receive their first maintenance herbicide treatment using CSBI resources in spring 2022 before the growing season is underway. Trees and shrubs will be protected by tree tubes at planting; neither landowner approved use of weed mats. CREP/CSBI continued to use glyphosate during Phase 2 of the pilot program. Although the City enacted a local law in 2021 restricting use of glyphosate, water supply facilities including watershed lands were exempted from the law enabling its continued use for site preparation and maintenance by CREP/CSBI and for site preparation by the base CSBI program.

- f) Plant sources/sizes. CSBI has a policy of procuring plants from a 300-mile radius from the county in which a project is located to ensure that the provenance of planting stock is as local as reasonably possible. Procuring plants from within this radius helps to ensure the genetics and conditions under which plants are grown are suitable for project sites and thus more likely to survive over the long term. During Phase 1, most plants were available from nurseries within the 300-mile radius and during Phase 2 all plants were supplied from within the radius. During Phase 1, plant availability (both size and species) was limited by delayed execution of the federal CREP contracts. Plants are procured by the installation contractor and must be ordered by mid to late August to secure the specified plants per the CREP and RCMP (for CSBI) planting plans. During Phase 2, federal contracts were executed in May 2020 enabling the contractor to submit plant orders in a timely manner.

- g) Feet of instability addressed. One of the four Phase 1 projects included a section of stream with unstable banks, which was excluded from the initial CREP/CSBI planting. During Phase 2, DCSWCD developed a stream restoration design for the unstable reach and stabilized 760 feet of streambank in 2021. In 2022, about 1.5 acres of riparian area adjacent to the restored reach will be planted with a CSBI project to link the previously planted CREP/CSBI buffers upstream and downstream of the restoration. This project highlights the advantages of a CREP/CSBI partnership in that it allows for establishment of continuous riparian buffers through areas of stream that would otherwise be ineligible for CREP planting alone. This approach seems reasonable at sites where migration of stream channel or bank instability is isolated from adjacent CREP-eligible areas.

- h) Debris management/removal. CSBI does not have an explicit policy to address debris on project sites, whereas CREP does not fund the removal of debris and will not approve a CREP contract until the site is fully clear of debris. In the past, small amounts of debris left from historic land use has been minor in scale and non-threatening to human safety or water quality; at those sites, debris removal was undertaken at nominal cost as part of the project. During Phase 2, extensive debris at two project sites required evaluation and

deliberation before DEP agreed to fund cleanup costs at one of the sites. DEP recommends further evaluation of this topic as part of the ongoing pilot program.

Metric 2.2. List of program constraints/limiting factors (e.g., time necessary for each administrative step in process, landowner indecision).

A number of programmatic constraints and limiting factors have been identified through the first two phases of the pilot, including staffing limitations inherent to the small size of the program and challenges related to identifying and making contact with potentially eligible landowners. Occasionally, after expressing initial interest in a CREP/CSBI project, landowners have changed their mind for a number of reasons, including: (a) an unwillingness to encumber their property for a contract’s time commitment; (b) feeling they are too old to see the benefit of the program; (c) feeling underwhelmed by the level of federal compensation for project; (d) deterred by the amount of paperwork required for a CREP/CSBI agreement; and (e) general distrust of the City or federal government. During Phase 2, COVID-19 and the City’s delayed registration of DEP’s successor SMP contract with DCSWCD resulted in multiple program-related slowdowns and shutdowns, which impacted the planning of new CREP/CSBI projects. Furthermore, changes to federal financial incentives and impacts on CREP contracts left a sense of uncertainty for some potentially interested landowners.

Metric 2.3. Funds contributed from the federal government; funds contributed from DEP via CSBI.

As summarized in Table 4, the Delaware County pilot program cost a cumulative total of \$454,435 to date, cost-shared nearly 12% by the federal USDA and 88% by the City through DEP contracts. Of this total, 48% supported the CREP/CSBI Planner position (based on WAC salary data through September 30, 2021), 51% supported project implementation, and 1% was directly provided to four Phase 1 landowners in the form of federal CREP incentive payments; three of these four landowners have continued their CREP contracts and currently receive combined federal incentive payments totaling \$1,188. The two Phase 2 landowners are expected to receive their first federal CREP incentive payments beginning in 2022, at which point the total annual incentive payments is expected to double, for a combined \$2,391 paid to all five remaining landowners with active CREP contracts. The USDA will continue providing \$2,391 per year in rental payments to these five landowners for the duration of their CREP contracts.

Table 4. Total Delaware County CREP/CSBI Pilot Program Cost-Share Summary.

Program Cost	USDA Funds	DEP Funds	Total Funds
Phase 1 Project Implementation	\$18,347	\$68,706	\$87,053
Phase 2 Project Implementation	\$31,409	\$115,531	\$146,940
Landowner Incentive Payments (through 2021)	\$3,662	\$0	\$3,662
WAC CREP/CSBI Planner (through 9/30/21)	\$0	\$216,780	\$216,780
Total:	\$53,418	\$401,017	\$454,435
Percent of Total:	11.8%	88.2%	100%

In Phase 1, the USDA contributed \$18,347 towards project implementation and DEP contributed \$68,706. In Phase 2, the USDA contributed \$31,409 towards project implementation and DEP contributed \$115,531. USDA and DEP each contributed 50% towards the cost of mowing to prepare sites for planting; planting the CREP base density; and installing tree tubes and weed mats for the CREP base density. DEP funded the installation of trees beyond the CREP base density, the establishment of buffer areas greater than 100 feet and less than 35 feet from streams, and mitigation of invasive species. For these pilot projects, if needed, the USDA and DEP will also cost-share herbicide treatments at the base of planted trees for the first and fourth years after planting, while DEP has agreed to fund second and third-year treatments. During Phase 2, DEP also funded a pre-planting site restoration at one property, which cost \$13,745.

During Phase 1, DCSWCD initially funded the salary and benefits for WAC's dedicated CREP/CSBI Planner through its SMP contract with DEP. In April 2019, DEP began funding this position through WAC's Agricultural Program contract. Since the start of the pilot through September 2021, the City has funded \$216,780 for this position, with \$94,199 initially paid from DCSWCD's contract and \$122,581 paid through WAC's contract.

Metric 2.4. Number of acres and/or linear feet planted. Number of acres of invasive species receiving treatment. Linear feet stabilized if part of pilot.

For both phases of the pilot, the overall totals are 37.9 acres of plantings, including 23.1 acres of CREP/CSBI plantings and 14.7 acres of CSBI-only plantings, spanning a total of 2.5 miles of stream (see Table 1). The four Phase 1 projects totaled 20.3 acres in planted area (12 acres of CREP/CSBI plantings; 8.3 acres of CSBI-only plantings) and spanned a combined 1.7 miles of stream length.

During Phase 2, WAC and DCSWCD completed two additional projects which totaled 17.5 acres of plantings (11.1 acres of CREP/CSBI plantings; 6.4 acres of CSBI-only plantings) and spanned a combined 0.8 miles of stream. When comparing the two phases, the Phase 2 projects had a significantly higher buffer area to stream length ratio, equal to 21.9 acres per mile of stream length, whereas the ratio in Phase 1 was approximately 12 acres per mile of stream length. This difference illustrates how the planted buffers have become wider and more expansive in the Phase 2 projects.

In 2021, DCSWCD completed a stream restoration project that addressed 760 feet of streambank instability along a reach that was first identified in a CREP/CSBI project planted during Phase 1 of the pilot. The restored reach will be planted with a 1.5-acre CSBI project to establish the riparian buffer between the previously planted upstream and downstream CREP/CSBI buffers.

Metric 2.5. Where used, herbicide use is tracked and reported: (a) begin to monitor efficacy of maintenance options (i.e., herbicide versus mowing, versus weed mats, etc.), and (b) track the number of landowners who elect for each type of maintenance and why (i.e., herbicide, mowing, weed mats, etc.).

Ultimately, survivability is determined by site preparation, size of plants and planting density, weed and invasive species control, and plant protection (tree tubes). During Phase 1, fall 2018 site preparation included mowing and herbicide treatment to control invasive species on all four sites, followed by spring 2019 planting and weed control using a variety of approaches including herbicide, or weed control mats made from coir (natural fiber) or Visicore (plastic). Tree tubes were used on most plants.

During Phase 2, monitoring for survivability was conducted post-planting in year one (spring 2020) and in summer year two (2021, results unavailable). Monitoring included assessing the survival and vigor of all plants on the project sites. A third year of monitoring will proceed in spring 2022 as required to assess survival under the CREP requirement that 60% of plants have survived. If fewer survive, a replanting will be required. As of fall 2021, each of the four Phase 1 project sites appeared well on track to meet the CREP 60% survival rate which is based on CREP's maximum allowable density of 125 plants per acre corresponding to a 19 foot plant spacing. The increased density afforded by the CSBI funding of the Phase 1 projects will help the projects meet this 60% survival threshold.

Several years of monitoring data will be required to conclusively assess the effectiveness of each method alone or in combination. First year (spring 2020) monitoring results for Phase 1 projects ranged from 91% to 73% survival of plants, with plots treated with herbicide having the greatest survivability (91%), slightly less with coir mats (88%), followed by Visipore mats (80%). One project site plot dominated by reed canary grass used coir mats and only 74% of plants survived.

Phase 2 project sites were prepared using mechanical removal of invasive species and brush hogging or mowing prior to the fall planting. Tree tubes were installed on all plants in fall 2021. In spring 2022, a first application of herbicide is planned for all plantings on both sites and weed mats will not be used, necessitating herbicide treatment each year. Monitoring plots will be established.

Metric 2.6. Estimated number of contracts a planner can implement per year, with details on the nature of contracts (e.g., planting only versus planting and invasive species or bank instability work).

The number of projects advanced by the CREP/CSBI program coordinator is influenced by various factors and ultimately by recruitment of new landowners into the program. Delays described within this report significantly limited the capability of program staff to conduct outreach and recruitment during Phase 2. At this writing, two projects are likely to proceed in 2022 and the program team anticipates achieving a minimum of four projects in 2022. The team now considers six planting projects per year as a reasonable target with concurrent pre-contract control of invasive species on additional sites ongoing for project enrollment in later years.

Metric 2.7. Number of landowners following Operations and Maintenance Agreements for the length of the pilot program.

All four Phase 1 landowners complied with their Operation and Maintenance plans throughout the reporting period. Landowners are asked to check and straighten tree tubes, protect plants from damage or mowing, control invasives as needed, and contact the DCSWCD or WAC if there are any concerns (such as flood damage). Landowners are allowed to mow after August 1, but no landowners have mowed within their project planting area. Landowners participated in maintenance by straightening tree tubes as needed and in some invasives management. No problems were reported although landowners did maintain contact with DCSWCD and WAC.

Ashokan, Schoharie and Rondout/Neversink Basins

DEP's primary goals for piloting a CREP/CSBI partnership in the remaining SMP basins were to: (1) assess level of agency interest in implementing CREP/CSBI projects, (2) assess the number and acreage of eligible properties, and (3) assess the level of landowner interest in CREP/CSBI projects within each county. As it did during Phase 1, Sullivan County SWCD declined to participate in Phase 2 of the CREP/CSBI pilot program due to the low estimate of eligible landowners in the Rondout/Neversink basins.

In fall 2019, Ulster County SWCD solicited 20 landowners regarding their interest in CREP/CSBI; six responded, and five site visits were conducted to discuss the program, resulting in four landowners becoming interested in CSBI. Similarly, Greene County SWCD solicited 155 landowners; nine landowners responded, seven site visits were conducted, and two landowners became interested in CSBI. Based on follow up with landowners, both Greene and Ulster County SWCDs report that federal contracting requirements coupled with modest rental and stewardship incentive payments are insufficient to compel landowners with less than one acre of riparian buffer to be planted. Both SWCDs remain willing to offer CREP/CSBI to larger parcel owners when they come into the base CSBI program in the future, but they have chosen not to actively promote the program at this time.

Conclusion and Recommendations

Despite several setbacks to the CREP/CSBI pilot program during Phase 2, two large projects were installed in 2021, covering a combined planting area of 17.5 acres and nearly 0.8 miles of stream length in Delaware County. On a cost-per-acre basis, the two Phase 2 projects were notably more expensive (approximately \$8,400 per acre) than the Phase 1 projects (approximately \$4,280 per acre), due to increased plant material quality and associated costs, pandemic-related cost increases, and an increase to the allowable cost per acre cap for plantings under the federal CREP. The Phase 2 projects were also wider and more expansive than the Phase 1 projects, with nearly double the buffer area to stream length ratio.

A significant pre-planting cleanup effort was completed at one of the Phase 2 projects, at an added cost of \$13,745 to CSBI (representing 23% of total direct implementation costs for this particular project). This cleanup provided a good example of how the flexibility built into the CREP/CSBI program can allow for consideration of sites that might have been ineligible through CREP alone, due to the presence of debris.

DEP believes a robust evaluation of the pilot program should include more projects in the coming years, and therefore recommends an additional extension of time to allow for sufficient progress needed to fully evaluate this program's capacity and potential. Data collected through pilot projects is essential for the planning and budgeting of a potential permanent program. DEP recommends the pilot be extended through 2025 to enable program partners to create sufficient interest, expand landowner recruitment, and implement additional projects. A third evaluation report would be submitted by DEP by November 31, 2025 that recommends either establishment of a permanent CREP/CSBI partnership or a discontinuation of the program.

DEP also offers the following recommendations for inclusion in the next phase of the CREP/CSBI pilot program:

- 1) Review success rates of plantings that use different plant spacing. The base CSBI program uses a denser planting plan, while the federal CREP prefers a 15-foot spacing for mowing and monitoring.
- 2) Develop standards and guidelines for working on parcels with debris requiring potential cleanup. This review will evaluate the current standards and practices of City and non-City programs in other states and regions to:
 - a) Evaluate and define a potential cost-share for parcels where cleanup costs could be significant, as well as cap on cleanup cost as a percentage of the overall project cost;
 - b) Establish a process for identifying where environmental surveys or assessments will be conducted, a reasonable schedule that provides ample time for cleanup in advance of contracting, and standards for determining when a cleanup is complete (such as post cleanup inspection and associated roles and responsibilities); and
 - c) Develop a special CSBI landowner agreement that addresses the added complexity related to remediating debris identified to be hazardous in an environmental site assessment or survey, as well as environmental health and safety considerations for any remaining debris that could impact future monitoring and access.
- 3) Encourage enhanced learning opportunities among program staff as these expansive project plantings are often more complex than traditional CSBI plantings – including additional factors, such as CREP requirements to treat with herbicide for weed control, the CREP survival requirement, and the monitoring needed to fulfill the goals of the pilot. The staffing and resources involved to plan the CREP/CSBI boundaries, including the presence of invasives and debris also require longer planning horizons.
- 4) Continue to offer a CREP/CSBI collaboration in the Ashokan, Schoharie and Rondout/Neversink basins when it aligns with landowner interests.