

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

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

November 2019

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



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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 enable CREP to be implemented on fallow agricultural lands through the CSBI 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 the Watershed Agricultural Council (WAC); establish metrics in collaboration with DCSWCD, WAC and the FAD regulators to evaluate the effectiveness of the Delaware County pilot program; review progress in extending CREP through CSBI in the WOH Watershed, including the Delaware County pilot program; and submit recommendations for establishment of a permanent program or discontinuation of the program.

Per the FAD, this report reviews the progress in extending a CREP/CSBI partnership to eligible fallow agricultural lands throughout the WOH Watershed during the two-year period November 2017 to November 2019. Based on lessons learned in exploring a CREP/CSBI partnership in all watershed counties and an analysis of the evaluation metrics that were developed for the Delaware County pilot program, DEP recommends an extension of the entire CREP/CSBI partnership (including the Delaware County pilot) for two additional years (until November 2021) followed by an evaluation report in November 2021 that recommends either establishment of a permanent CREP/CSBI partnership or a discontinuation of the 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. As the name implies, CREP provides farmers with enhanced financial incentives and technical assistance 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 support the implementation of CREP practices that establish riparian buffers on participating farms. As of September 2019, 130 landowners had enrolled or re-enrolled approximately 1,678 acres of riparian buffers on retired agricultural lands in 168 active CREP contracts. Over the past five years, three new landowners owning about 17 acres have enrolled in CREP each year.

CSBI is a component of DEP's Stream Management Program (SMP) that was developed in 2009 pursuant to the 2007 FAD, which required the City to continue its riparian buffer protection efforts through existing programs while initiating selected program enhancements such as voluntary landowner agreements, education and training, and the development of riparian planting plans. The intent for CSBI was to provide 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 local SWCDs in Delaware, Greene, Sullivan and Ulster counties; thus, DEP funds a CSBI coordinator position in each of the SMP

basins (Ashokan, Cannonsville/Pepacton, Rondout/Neversink, and Schoharie) who work directly with riparian landowners to identify and implement CSBI planting projects. As of September 2019, CSBI had completed 217 planting projects spanning just over 121 acres (18.4 stream miles). Over the past five years, CSBI has planted about 14 projects and seven acres annually.

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, WAC and DCSWCD proposed a two-year pilot program to partner components of CREP and CSBI for the purpose of accelerating riparian buffer implementation within the WOH Watershed. DCSWCD and WAC proposed hiring a dedicated CREP/CSBI planner to solicit landowners, prioritize basins for project implementation, and work with the Delaware County CSBI Coordinator to plant 20-25 acres of riparian buffers out of an estimated 8,000 acres of potentially eligible land throughout the entire WOH Watershed as identified by DCSWCD and WAC.

Following numerous stakeholder meetings during 2016 and 2017, DEP agreed to fund the CREP/CSBI pilot program as proposed by DCSWCD and WAC, limited geographically to Delaware County. This commitment was codified in the 2017 FAD, which also required that DEP collaborate with DCSWCD, WAC and the FAD regulators to establish evaluation metrics for the Delaware County pilot. DEP submitted proposed metrics in November 2018, and they were subsequently approved by NYSDOH.

The 2017 FAD also required 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 of the SMP partners took the same basic approach to identifying potentially 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 DCSWCD's CSBI coordinator and local USDA staff, including a dedicated NRCS CREP planner; other SMP partners relied on existing staff, primarily the CSBI coordinator.
- 2) In Delaware County, WAC and DCSWCD used a formal 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.

Because the programmatic structure and staffing of the CREP/CSBI pilot differed in Delaware County compared to the other WOH Watershed counties, and since Delaware County had its own set of evaluation metrics, DEP discusses in this report the progress of the Delaware County CREP/CSBI pilot program separately from the other counties/basins.

Delaware County Pilot Program

In November 2017, DCSWCD and WAC entered into a memorandum of agreement that formalized their joint administration of the pilot program and defined respective roles and responsibilities. The agreement enabled DCSWCD to provide \$98,000 in DEP Stream

Management Implementation Program (SMIP) funding from its SMP contract to support WAC hiring a CREP/CSBI planner, and to dedicate \$43,750 in DEP SMIP funding to enhance CREP planting efforts and support project implementation.

By the end of 2017, before conducting any program outreach or mailing landowner surveys, WAC and DCSWCD had already identified six initial landowners for inclusion in the pilot based on the characteristics of their riparian properties and their common location within one tributary (East Brook in Walton); four of these landowners signed contracts to enroll in CREP/CSBI during summer 2018, and all sites were planted during spring 2019.

Table 1 summarizes the four completed Delaware County pilot projects. Of the 20.3 acres planted through the CREP/CSBI pilot, approximately 12 acres enrolled in CREP for a total federal cost share of \$18,347 that was applied to the cost of riparian planting. The USDA also contributed \$17,025 in incentive payments for all four landowners, and will continue to provide \$1,287 annually in combined rental payments to all four landowners for the duration of their contract terms (two landowners signed 10-year contracts and two signed 15-year contracts).

Table 1. Summary of Delaware County CREP/CSBI Pilot Projects.

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	1050	0.61	0.97	\$954	\$9,715
Sub-total	7,375	1,510	11.99	8.35	\$18,347	\$68,706
Total	8,885 feet = 1.7 miles		20.3 acres		\$87,053	

Beginning in spring 2018, DEP convened an interagency committee of watershed partners and FAD regulators (WAC, DCSWCD, USDA, NYSDOH, USEPA and NYSDEC, although the latter agency did not participate in any meetings) to collaboratively develop proposed metrics for evaluating the Delaware County pilot program. This committee met several times throughout summer 2018 and established two broad goals for the evaluation: (1) determine the level of landowner interest in CREP/CSBI partnership projects and characteristics of parcels of interested landowners, and (2) determine the process for CREP/CSBI collaboration. For each goal, the committee proposed a series of metrics to inform the pilot program evaluation; pursuant to the FAD, these metrics were submitted to NYSDOH in November 2018 and subsequently approved. The following is a discussion of the CREP/CSBI pilot program metrics based on the activities and accomplishments of WAC and DCSWCD within Delaware County.

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.

Using a GIS analysis that selected fallow agricultural parcels with at least 0.5 acres of non-forested area within 100 feet of a watercourse, WAC identified an estimated 762 acres of plantable land in Delaware County that are potentially eligible for CREP/CSBI. By comparison,

DEP conducted an initial GIS analysis in the Ashokan, Schoharie and Rondout/Neversink basins that estimated over 5,900 acres of potentially plantable (i.e. non-forested) area within 100 feet of a watercourse (and at least 0.25 acres in size per parcel), of which an estimated 517 acres are potentially eligible for CREP/CSBI once other limiting factors are considered (e.g. presence of extensive invasive species, wetlands, unstable streambanks, and a minimum of one acre of plantable area per parcel). The combined GIS analyses indicate at least 1,279 acres of land that are potentially eligible for the CREP/CSBI program within the WOH Watershed (762 acres in Delaware County and 517 acres in other counties).

DCSWCD and WAC initially estimated 8,000 acres of potentially plantable riparian land within the WOH Watershed. Although this number is likely a reasonable first estimate of potentially plantable acres, after taking limiting factors into consideration, the CREP/CSBI pilot led to a refined estimate of 1,279 acres that may be programmatically eligible. However, DEP believes that 1,279 acres is a conservative estimate. For example, the GIS analysis likely underestimated eligible acreage by assuming a uniform buffer width of 100 feet (the maximum eligible under CREP), even though a given landowner may opt for a buffer ranging from 35 feet (the minimum CREP width) to a few hundred feet through CSBI.

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

WAC used a two-step survey approach to assess landowner interest in a CREP/CSBI planting project. In winter 2018, WAC mailed an initial survey to 489 landowners (representing 762 potentially eligible acres) and received 187 responses (38% response rate), of which 135 landowners (72%) expressed interest in the pilot. In winter 2019, WAC mailed a follow-up survey to a subset of 111 interested landowners from the initial survey, and 65 landowners responded (59% response rate). Of these 65 respondents, 46 landowners (71%) indicated continued interest in the pilot. Based on these surveys, WAC has identified at least 46 landowners owning 90.9 acres of potentially eligible land in Delaware County who are conceptually interested in a CREP/CSBI project. Given the method used, 46 landowners is likely an underestimate because landowners can change their mind, parcels can change ownership, and mail solicitations may not be the preferred mode of communication for some landowners.

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.

WAC and DCSWCD established the groundwork for future landowner outreach and CREP/CSBI enrollment by prioritizing 23 sub-basins within Delaware County based on the relative amount of open or non-forested land, plantable buffer area within 100 feet of water, and agricultural land; the top six (all located in the Cannonsville basin) are: East Brook, West/Third Brook, Upper Little Delaware, Platner Brook, West Branch, and Delaware River/Mallory Brook. WAC and DCSWCD expect to prioritize buffer areas within priority sub-basins, based on factors such as proximity to current/legacy farms and soil loss/erosion potential, by early 2020.

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 was established to fine-tune the estimate of potentially eligible acres by assessing the number of CREP/CSBI planting projects that might require additional time or resources such stream bank stabilization or extensive invasive species mitigation. DEP does not yet have a clear indication of the portion of realistic project sites due to factors such as instability or extensive invasive species; however, DEP expects to report on this metric in the future.

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.

As previously noted, WAC mailed an initial survey to 489 landowners which identified 135 interested respondents. WAC mailed a follow-up survey to a subset of these respondents (111 landowners), and received a 59% response rate (65 landowners), which exceeds the metric.

The second survey indicated that of six potential programmatic benefits to landowners (water quality protection, streambank stabilization, stream/wildlife health, invasive species control, practices installed at no cost, financial incentives), the highest proportion of respondents consider water quality protection the most important benefit and financial incentives the least important. This indicates that financial incentives are not the main driver for landowner enrollment. When asked how wide of a buffer landowners would consider, roughly one third of respondents indicated less than or equal to 35 feet, one third up to 100 feet, and one third greater than 100 feet. The financial benefits from CREP are limited to buffer areas between 35-100 feet wide.

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.

Mail surveys only indicate whether landowners are conceptually interested in a potential CREP/CSBI project. The process of evaluating future enrollment potential often involves one-on-one contact so that landowners understand program benefits and constraints for their specific properties. During the pilot, WAC and DCSWCD directly contacted 16 landowners who had expressed interest through the survey, noting that some remained interested in potentially enrolling, while others remained noncommittal. DCSWCD and WAC have paused the process of enrolling additional landowners until after federal CREP policies are updated due to anticipated changes in the Farm Bill (likely in early 2020). Without further outreach or enrollment statistics, DEP feels it is premature to use the survey results to predict the number of landowners who are likely to enroll; more time is needed to accurately assess the level of landowner interest.

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 project 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.

To assist with determining how best to integrate the different policies and processes of both CREP and CSBI, DEP evaluated the four initial Delaware County pilot projects for their ability to integrate the following program components:

- a) Riparian Corridor Management Plans (RCMP). Although DEP envisioned that RCMPs would serve as the conservation plans to facilitate CREP contracts, RCMPs were not used in this way during the pilot. All four landowners are expected to receive RCMPs by the end of 2019, to be used as a reference. This approach is acceptable to DEP so long as county CSBI coordinators co-lead the process of developing the planting plans.
- b) Increased planting densities through CSBI. All four pilot projects received enhanced planting densities. CREP cost shares up to 125 plants per acre, and the four CREP/CSBI projects ranged in density from 190 plants per acre to 350 plants per acre.
- c) Increased buffer width. The maximum buffer width under CREP is 100 feet, whereas CSBI can extend the buffer width. Using CSBI resources, one project received a buffer that ranged from 150-300 feet in width. In addition, two landowners were willing to buffer additional streamside areas, but did not wish to allocate at least 35 feet, which precluded these areas from a CREP contract; CSBI complemented these projects by planting buffers less than 35 feet in certain areas.
- d) Ongoing invasive species mitigation. Per federal policy, CREP does not fund multi-year invasive species mitigation beyond site preparation or maintenance at the base of planted trees. CREP traditionally expects the landowner to handle ongoing invasive species mitigation. To support the Delaware County pilot, CSBI is funding multi-year invasive species mitigation on all four pilot projects through herbicide applications.
- 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 applications four years after the planting is completed, where needed. Each landowner in the pilot program opted for a different maintenance type or combination of types: one landowner opted for herbicides, one opted for a combination of weed mats and coir mats, one chose coir mats only, and one chose weed mats only. The landowner who chose herbicides has a goal of making his land productive, and felt this was a standard practice. The two landowners who opted for weed or coir mats wanted to maintain a natural property for their children to play, and the landowner who chose coir mats felt they are more natural than traditional plastic-based weed mats.
- 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 are 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 are thus more likely to survive over the long-term. As part of the pilot, DEP and its partners agreed to maintain this standard. For all four projects, WAC, DCSWCD, and NRCS report that almost all plants came from within this radius; the limiting factor was difficulty aligning the timing of CREP paperwork with nursery orders while plant stock was available. As for plant sizes, CREP is limited to using relatively small plants, while CSBI uses a wide range of plant sizes. All four pilot projects primarily have 18-24 inch bare root seedlings, which are protected from herbivory and competition using tree tubes and maintenance practices. Depending on site conditions, incorporating larger trees can help to overcome herbivory and competition, and to also delineate project boundaries. CSBI provided large trees (6-8 feet tall) for portions of two pilot projects.

- g) Feet of instability addressed. Three of the pilot projects have stable streambanks. One project, however, has approximately 400 feet of instability, so the riparian area adjacent to this unstable section was exempted from CREP/CSBI planting. DCSWCD expects to treat this instability in 2020, and then CREP/CSBI or CSBI-only will plant the remaining buffer. The Delaware County pilot demonstrates that it is possible to revegetate parcels having unstable streambanks by removing those portions from the CREP contract.

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

DEP and its partners have identified a few constraints and limiting factors, including the practical reality that landowners tend to change their minds several times before committing to or completing a planting project. Other examples include: time allocated to payment estimates and project area maps; time needed for administrative paperwork to be processed; and time needed for landowner signatures, especially absentee landowners. Because these factors are inherent to volunteer programs, staff cannot easily overcome them through changes in process or protocol.

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

In total, the Delaware County pilot program cost \$198,277, cost shared 18% by the federal government and 82% by the City. Of this total amount, 47% supported the WAC staff position, 44% supported project implementation, and 9% was directly provided to landowners in the form of federal CREP incentive payments. The USDA will continue providing \$1,287 per year in rental payments to all four landowners for the duration of their CREP contracts.

The USDA contributed \$18,347 towards project implementation costs and DEP contributed \$68,706, comprised of \$52,962 paid by WAC through its agreement with DCSWCD (exceeding the original budget by \$9,212, or 21%) and \$15,744 paid directly by DCSWCD for invasive species mitigation. 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 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.

In addition to cost-sharing project implementation, the USDA contributed a total of \$17,025 in incentive payments for all four landowners, and will continue to provide \$1,287 annually in combined rental payments to all four landowners for the duration of their contract terms. Through its SMP contract with DCSWCD, DEP funded the salary and benefits for WAC's dedicated CREP/CSBI planner for the duration of the pilot period, which totaled \$94,199 out of \$98,000 budgeted. DEP funding for this position is now provided through WAC's Watershed Agricultural Program contract that commenced April 2019.

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.

WAC and DCSWCD completed 20.3 acres of plantings that spanned 1.7 miles of stream; these projects included 0.9 acres of invasive species treatment. None of the four pilot projects involved stabilization; however, one project contains approximately 400 feet of instability that were exempted from CREP/CSBI planting. DCSWCD expects to treat this instability in 2020, and then CREP/CSBI or CSBI-only will plant the remaining buffer.

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.).

Since the four pilot projects were just planted in spring 2019, each site was monitored only once during the summer and so more time is needed for DEP to report on the efficacy of herbicide use in comparison to weed mats, coir mats, and other maintenance options.

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).

Based on the four pilot projects, WAC estimates that a dedicated planner can implement 6-10 contracts per year, likely addressing 20-25 acres per year. However, DEP notes that during the pilot WAC's dedicated planner focused a large portion of time on tasks outside of contract administration, such as conducting the initial GIS analysis and coordinating the mail surveys. As a result, the annual pace of implementation for CREP/CSBI projects remains an unknown factor until more contracts are implemented. Several factors can affect the amount of time needed to complete a contract: absentee landowners can take longer to sign paperwork and give feedback on project scope; federal government dynamics can impact approvals and work flow; and the pace of recruiting landowners may depend on building momentum among neighbors. In addition, although the presence of invasive species and streambank instability did not slow the pace of the four pilot projects, it is possible that invasive species mitigation could delay the implementation of future plantings. Likewise, although small areas of instability could be removed from CREP enrollment and addressed later, after the majority of a parcel is enrolled, it is possible that

projects with relatively large areas of instability could delay implementation of plantings. For example, traditional CSBI projects with extensive invasive species sometimes require a few years of mitigation before plantings can be completed.

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

To date, regardless of the type of maintenance, there have not been any issues with the four current landowners following the Operations and Maintenance (O&M) Agreements. DEP's partner staff will be coordinating and assisting landowners with O&M, and will remain in contact with landowners to ask how O&M is proceeding. DEP and its partners have yet to determine the way in which RCMPs will integrate the CREP and CSBI O&M protocols.

Summary discussion of Delaware County pilot program

In general, it appears that CREP and CSBI complemented each other well. In particular, the relative flexibility of CSBI enabled multi-year invasive species mitigation on portions of the four pilot projects, and the enhanced density should help ensure that the CREP survivorship rate is maintained (60% of the CREP standard density) without the need to re-plant. In addition, for portions of streamside properties where landowners were unwilling to plant the minimum 35-foot buffer width required by CREP, CSBI was able to buffer these sections and allow more length of stream to be vegetated. DEP agrees with its partners that CREP/CSBI combines the best of both programs by offering landowners the ability to improve their properties by establishing forested riparian buffers, while receiving federal cost sharing and CREP rental payments. Landowners also have the flexibility of installing additional practices not included in CREP, such as native seed establishment, expansion of planting areas and plant densities, invasive species control, and addressing streambank stability issues.

Adhering to the CSBI policy of procuring plants from a 300-mile radius is one program component that can be improved upon by completing contracts as early as possible, before plant availability becomes an issue. However, the feasibility of this timeline for a given project also depends on factors that cannot be controlled by local partners, such as the time it takes for landowners to commit to a planting, or administrative delays in paperwork.

There is one program component for which CREP and CSBI do not naturally complement one another: the use of herbicides for controlling herbaceous vegetation around the base of planted trees and shrubs to potentially enhance survivorship. Although CSBI and CREP both use herbicides, these programs differ in their (a) approach to the circumstances under which herbicides are used, and (b) the type of herbicides that are applied. Both programs use herbicides to mitigate invasive species, and both use post-emergent herbicides which act on plant tissue after seed germination. CREP, however, also uses herbicides for maintenance, while CSBI currently uses non-chemical methods such as weed mats. Also, while both programs use post-emergent herbicides, CREP has the potential to use pre-emergent herbicides that prevent seeds from germinating. Two pre-emergent herbicides that were proposed for use during the pilot are prohibited from use on land owned or leased by New York City per Local Law 37. While this law does not prohibit all pre-emergent herbicides, DEP currently does not use pre-emergent

herbicides in the watershed. Although CREP and CSBI projects primarily involve private lands, CSBI strives to adhere to the spirit of the practices that DEP has adopted. DEP is also aware that the City of San Francisco, another unfiltered water supplier, currently restricts the use of pre-emergent herbicides due to concerns over groundwater contamination.

Despite differences in how CREP and CSBI use herbicides, DEP agreed to cost share herbicide use for maintenance during the pilot. To date, the frequency and scale of herbicide use is less than anticipated, with only one of the four landowners opting to use herbicides for maintenance. Due to limited herbaceous growth thus far, a pre-emergent herbicide has only been applied at one time, rather than annually as was expected. Also, neither of the two initially proposed pre-emergent herbicides were used during the pilot, rather a pre-emergent herbicide that is not prohibited by Local Law 37 was used. Given landowner preference and the site-specific nature of these management decisions, DEP remains uncertain about the type of herbicides that should be used and the frequency of their use for maintenance. In an extended pilot program, monitoring to evaluate efficacy would be continued for later evaluation.

Ashokan, Schoharie and Rondout/Neversink Basins

Outside of Delaware County, DEP's main goals for piloting a CREP/CSBI partnership in the remaining SMP basins were to (1) assess the 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.

Goal 1: Assess agency interest.

In 2017, DEP met with county SWCD staff to introduce the CREP/CSBI partnership concept, propose an approach for assessing landowner interest, and discuss a process for working through projects. Greene and Schoharie SWCDs were each supportive of assessing landowner interest, so DEP also met with local NRCS and FSA staff. In both counties, partner agencies agreed to pursue pilot projects in support of a CREP/CSBI collaboration. Sullivan SWCD is not currently interested in offering a CREP/CSBI partnership due to the low estimate of eligible landowners in the Rondout/Neversink basins. Ulster SWCD opted to wait until its successor SMP contract is registered in early 2020, to ensure available DEP funding.

Goal 2: Assess landowner interest.

In early 2018, DEP and its SWCD partners designed and implemented a GIS approach to screen parcels for CREP/CSBI eligibility. This approach selected parcels having at least one acre of non-forested plantable area within 100 feet of a watercourse. Between spring 2018 and summer 2019, local CSBI coordinators mailed solicitation letters or postcards to 196 potentially eligible landowners in Greene, Schoharie, and Ulster counties. Coordinators mailed to small groups of landowners at one time in case there was an overwhelming level of interest.

Although the overall response rate was low (only 18 landowners or 9% of those surveyed), most landowners who responded to the solicitation (83%) were interested in a site visit (Table 2). CSBI coordinators kept records of conversations during site visits and conducted

follow up correspondence to be able to glean why landowners were or were not interested in CREP/CSBI. Thus far, no landowners are interested in a CREP/CSBI project, although eight landowners (owning 18.1 potentially plantable acres) are interested in CSBI-only projects.

Table 2. Summary of landowner solicitation results for CREP/CSBI, by county.

County	Candidate parcels	Candidate acres	Landowners solicited	Landowners responded	Site visits conducted	Landowners interested
Greene	155	398	155	9	7	3 CSBI
Schoharie	21	72.9	21	3	3	1 CSBI
Sullivan	7	10.2	0	n/a	n/a	n/a
Ulster	20	35.8	20	6	5	4 CSBI
Total	203	516.9	196	18	15	8 CSBI

Conclusion and Recommendations

The CREP/CSBI accomplishments during the past two years demonstrate that most program components complement each other well. However, given the uncertainties associated with the level of demonstrated landowner interest and the anticipated number of contracts that can be implemented annually, DEP recommends extending the CREP/CSBI pilot program for two additional years (until November 2021) in Delaware, Greene, Schoharie, and Ulster counties. In Delaware County specifically, extending this pilot program will provide an opportunity to demonstrate whether (1) at least 6-10 landowners in Delaware County will enroll in the program annually; and (2) the CREP/CSBI planner will continue to enhance the annual number of riparian revegetation projects above the CSBI base program average, which is typically around five new projects each year.

Extending the pilot program would also afford an opportunity to continue working towards greater synergy in regards to (1) collaborating with all partners on the development of planting plans; (2) sourcing plants from within the CSBI designated area; and (3) ongoing dialog around herbicide use for maintenance. DEP recommends submitting a second evaluation report in November 2021 using the same metrics developed for Delaware County, including an update on CREP/CSBI activities in Greene, Schoharie, and Ulster counties. Funding for the extended pilot program is currently available through DEP's current contract with WAC (to support the CREP/CSBI planner position) as well as DEP's current and successor contracts with its SMP partners (to support the CSBI cost share for project implementation).