Great Lakes Basin Program GLRI Project

Lower Chagrin River Sediment Reduction BMP Program

Size: watershed
Grant Amount: $270,000
Year awarded: 2012

Sponsor: Chagrin River Watershed Partners, Inc.
Address: P.O. Box 229
City: Willoughby
State: Ohio
Zip: 44096-0229

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Submitted Project:

Size: watershed
Budget: $270,000
Savings: 2,978

Background

Sediment Sources
The Chagrin River watershed drains to the central basin of Lake Erie in the City of Eastlake. Sediment is identified as a cause of impairment in Ohio EPA's *Chagrin River Total Maximum Daily Load (TMDL). http://www.epa.ohio.gov/dsw/tmdl/ChagrinRiverTMDL.aspx*. Sediment impacts habitat suitability for aquatic life in the Chagrin River as well as being a mode of transport for phosphorous and other pollutants to Lake Erie. Sources of sediment in the Chagrin River Watershed include streambank and streambed erosion, slope failure, construction, suspended solids carried from stormwater runoff, and runoff from agricultural lands in the watershed. The East Branch of the Chagrin River and the subwatersheds of the Lower Chagrin HUC, Ward/Newell Creek, and Corporation Creek, are specific watersheds targeted for streambank stabilization in this grant proposal, all of which are identified as sediment sources to Lake Erie within the Chagrin River Watershed Action Plan (CRWAP). http://www.crwp.org/watershed_action_plan/watershed_action_plan.htm.

Ohio EPA also identifies streambank erosion as a significant source of sediment for the Chagrin River and its tributaries. The CRWAP lists streambank erosion as a source of sediment specifically for the East Branch of the Chagrin River (CRWAP, p. 66), Ward/Newell Creek (CRWAP, p. 65) and Corporation Creek (CRWAP, p. 63). Removal of riparian vegetation along the East Branch of the Chagrin River is also indicated as a sedimentation source in *Ohio EPA's Biological and Water Quality Study of the Chagrin River and Selected Tributaries 2003-2004* (p. 18).
http://www.epa.ohio.gov/portals/35/documents/ChagrinRiverTSD_2003to2004.pdf

The lower reaches of the Chagrin River routinely require dredging to main access for recreational boats. Surveys from Ohio EPA and anecdotal notations by the Port Authority of Eastlake indicate that sedimentation

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has increased in recent years. This project will provide sediment and erosion control in the most lower Chagrin which is the most urbanized areas of the Chagrin River watershed and the East Branch of the Chagrin which exhibits severe erosion due to streambank instability and downcutting from historic gravel mining activities.

Readiness to Implement Project
Conceptual designs for stream bank stabilization practices will be developed by Lake and Geauga County Soil and Water Conservation District (SWCD) technicians in cooperation with CRWP staff and a private consulting firm hired to formalize stream restoration designs. Heavy use pad, grassed filter strips and fencing practices will be designed by a private consultant following NRCS design standards or will be designed in cooperation with NRCS staff.

CRWP anticipates that the streambank stabilization projects will require Section 404 Nationwide Permits from the US Army Corps of Engineers prior to construction. Additional permitting coordination with the Ohio Department of Natural Resources will be completed for streams requiring State Scenic River permit approval. CRWP will work with property owners to complete and submit all permitting requirements. No permits are anticipated for filter strips, fencing, and heavy use pads. Lake and Geauga SWCDs manage the sediment control regulations in their respective Counties and will ensure that sediment is managed throughout construction.

Landowner permission will be required and obtained through an approved written contract between the landowner and CRWP. Easements will not be required for any proposed work.

CRWP approved grants over $25,000:

- $821,000, National Estuarine Research Reserve, November 2011- October 2014, Implementing Credits and Incentives for Innovative Stormwater Management
- $129,600, Ohio Lake Erie Commission, January 2009 - November 2012, Planning to Mitigation: Community Planning, Zoning, Site Design, and Advancement of In-Watershed Mitigation to Minimize the Export of Wetland and Stream Functions during Development
- $90,000, Ohio Department of Natural Resources Division of Soil and Water Conservation, 2011 – 2013, Watershed Coordinator: Implement Chagrin River Watershed Action Plan
- $46,000, US Fish & Wildlife Service – Great Lakes Basin Fish Habitat Fund, August 2011-December 2013, Sulphur Springs Restoration & Assessment
- $35,000, Northeast Ohio Regional Sewer District, September 2011- August 2012, Watershed Program Support
- $35,000, Northeast Ohio Regional Sewer District, September 2010- August 2011, Watershed Program Support
- $30,000, Northeast Ohio Regional Sewer District, September 3, 2009 - August 31, 2010, Subwatershed Planning and Member Support

Project partners include the Lake County Soil and Water Conservation District and the Geauga County Soil and Water Conservation District. Trained technicians from the Lake and Geauga SWCDs will visit each property upon request to provide technical assistance on proper BMP selection and will evaluate sedimentation impacts related to stream bank erosion, riparian corridor management, paddock management and available cost share opportunities. CRWP will also work closely with the communities in the Lower Chagrin and East Branch watersheds including Chardon, Chester, Claridon and Munson Townships, the Villages of Kirtland, Kirtland Hills and Waite Hill, the Cities of Chardon, Eastlake, Mentor, Willoughby, Wickliffe and Willoughby

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Hills. In addition, CRWP will work with Lake Metroparks, Geauga Park District, Western Reserve Land Conservancy, and Holden Arboretum to target possible implementation sites.

The Chagrin River Watershed Partners, Inc. (CRWP) is a non-profit organization that provides technical assistance to its Members and develops cost effective, prevention focused solutions to minimize new, and address current, natural resource management problems as communities grow. CRWP is an established organization that has grown from 16 Members in 1996 to an active collaboration of 37 Member townships, counties, cities, villages, and park districts, representing 99% of the watershed. CRWP's mission is to strive to preserve and enhance the scenic and environmental quality of the ecosystem of the Chagrin River and its watershed in a manner that assures a sustainable future for people, plants and animals.

The CRWP Board of Trustees is made up of community officials from each Member community and at large trustees from other conservation organizations and interested citizens. The Board of Trustees routinely has 40-45 attendees at the quarterly meetings to discuss watershed issues and implementation projects. Working with our Members and other watershed stakeholders, CRWP provides tools for Members to address current, and minimize new, flooding, erosion, and water quality problems. These efforts have raised the awareness of local elected officials and citizens in the Chagrin River watershed of the need to minimize the impacts of development through better land use decisions.

CRWP developed the state-endorsed *Chagrin River Watershed Action Plan* in 2006 and revised the Plan in 2009 to include the TMDL implementation and to include the 2009 State of Ohio endorsed *Chagrin River Watershed Balanced Growth Plan*. Specific sediment reduction BMPs and implementation locations are included in the Plan. Streambank stabilization of the East Branch of the Chagrin River and the tributaries of the Lower Chagrin River watershed using natural channel design and riparian vegetation reestablishment methods are identified as a means of addressing siltation and direct habitat restoration on page 104 of the CRWAP.

Both plans can be found at http://www.crwp.org/watershed_action_plan/watershed_action_plan.htm. Specific sediment control projects recently completed within the Lower Chagrin River include the installation of bioretention cells at the City of Eastlake Service Department funded through the Ohio EPA's Surface Water Improvement Fund. Proposed sediment control projects within the Lower Chagrin River include stream bank stabilization and riparian restoration of 2,924 linear feet of Ward/Newell Creek. This specific project is targeted for sediment reduction as part of a Great Lakes Restoration Initiative 2012 grant proposal. This project also includes reducing the runoff volumes from a major commercial retail center. Sediment reduction projects within the East Branch of the Chagrin River include a project that has been recommended for FFY 2012 funding from a Ohio EPA Section 319 grant to restore 385 linear feet of stream bank along the East Branch, 330 linear feet of primary headwater stream and 3.5 acres of riparian corridor along the East Branch at river mile 11.5. A dam modification and stream restoration on a tributary to the East Branch was completed in 2009 with funding from Ohio EPA's 319 grant program. An additional sediment reduction training program for local road departments targeting erosion and sediment control BMP application techniques for roadside ditch stabilization funded through the Ohio Lake Erie Commission's Lake Erie Protection Fund will be completed by July 2012 and has provided training to over 20 different road departments within the Chagrin River watershed.

We are partnering with Lake and Geauga SWCDs and local communities and park districts on this project. Lake SWCD staff will prepare restoration plans for landowners needing streambank stabilization. This technical oversight of restoration planning will help ensure project success.

Project Work Area
HUC: 041100030403 - Town of Willoughby-Chagrin River, Ohio
HUC: 041100030401 - East Branch Chagrin River, Ohio
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Keeping It On the Land

Great Lakes Basin Program for Soil Erosion and Sediment Control
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Total Area: 32661
Agricultural Area: 3833
Forest Area: 22495
Urban Area: 10544

Priority Areas:
Stream bank restoration will be targeted for primary headwater streams and smaller tributaries with drainage areas of less than 2 square miles within the Lower Chagrin and East Branch HUCs. Cost-effective implementation of small scale restoration BMPs will provide greater linear feet of stream bank restoration and riparian corridor revegetation and greater square footage of bare soil stabilization through the installation of heavy use pads, grassed filter strips and fencing on privately owned properties within each HUC. The agricultural practices will target areas adjacent to stream, wetland or drainage resources. Heavy use pad practices are specifically targeted for equine owners and operations. Areas containing Highly Erodible Land soils will receive additional prioritization. Stream bank stabilization practices will target suburban residential land use affecting primary headwater stream resources altered by riparian corridor removal and conversion to non-woody vegetation.

Additional prioritization will be given to cold-water primary headwater streams or those tributary to streams that do not currently meet water quality standards. All of the streams in the East Branch subwatershed are designated as coldwater habitat streams while the resources in the Lower Chagrin are warmwater habitat streams. The East Branch of the Chagrin River is in attainment of Ohio EPA's coldwater habitat (CWH) aquatic life use designation water quality standard except for areas receiving impacts from sedimentation, suburban development, flow alteration and riparian corridor removal. The East Branch is also designated as an Outstanding State Water based on exceptional ecological value listed in Ohio EPA's antidegradation rule and is a State Scenic River. The East Branch of the Chagrin River contains tributary streams where native brook trout have been reintroduced while other streams support declining species such as Redside dace. The Lower Chagrin River and East Branch are designated as seasonal salmonid streams and receive annual spawning runs of steelhead trout from Lake Erie.

Implementation

Implementation Strategy
Stream Bank Stabilization: Stream bank stabilization practices will target primary headwater streams draining up to 2 square miles in HUC 041100030403 and 04110030401. There are over 3,400 properties with streams of this size that will have the opportunity to participate in this program. Lake and Geauga SWCD and CRWP staff will develop conceptual plans for each landowner and coordinate a finalized restoration plan by the design firm subcontracted by CRWP. Final restoration plans will include a grading plan, stream bed profile, bankfull width and floodplain cross sections and details of stream bank stabilization practices necessary to facilitate appropriate construction and approval by permitting agencies, if required. The design will also include a riparian area restoration planting plan. Property owners may either hire their own contractors to install restoration designs or work with a CRWP contractor that may be hired to complete multiple streambank restoration projects. This flexibility allows property owners who have contacts or their own equipment to minimize costs, but also provides a mechanism for CRWP to hire a contractor with the landowner cost share to ensure proper construction of streambank stabilization plans. All permitting requirements will be completed prior to the commencement of restoration.

Restoration designs will be required to meet accepted natural channel design specifications and approved engineering standards from the NRCS Field Engineering Handbook. Only soft engineering/restoration practices will be approved.

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A cost - share of 75% (up to $75 /linear foot) will be provided following the completion of the project and approval of the installation by CRWP with oversight assistance provided by Lake and Geauga SWCDs. The Bank Erosion Hazard Index (BEHI) will be used to determine the severity of erosion and calculate the estimated sediment reduction over the life of the installed practice.

The project goal is to restore 1,800 feet of eroding stream bank over the three years of the project.
Heavy Use Pad: Heavy use pads, or all weather paddocks will receive a cost - share amount of 50%. Property owners managing horses are specifically targeted for this practice to assist in reducing sediment discharge from over used or insufficient paddock areas. A minimum sized heavy use pad of 60 feet by 60 feet will be required and shall meet the NRCS design and operation and maintenance standards and specifications listed in the Field Engineering Handbook (Code 561). Landowners can create larger heavy use pads, however, cost - share assistance will only apply to the minimum 60 feet by 60 feet requirement. The project goal is to install 5 heavy use pads over the three years of the project. Ohio NRCS construction cost estimates of $1.09 per square foot of installed practice will be used as the cost share construction rate.

Filter Strip: Cost - share assistance of 25% will be offered to landowners to establish grassed filter strips adjacent to streams. Both cool and warm season grasses will be eligible and shall meet NRCS standards and specifications listed within the Field Engineering Handbook (Code 393). A minimum width of 25 feet up to 100 feet will be reimbursable. Grassed filter strips will be cost - shared at a one - time rate of $302/acre and will be eligible during all three years of the program. The project goal is to stabilize bare or poorly vegetated soils on 6 acres, which will provide a buffer width of 100 feet on either side of a stream or swale covering 1,300 linear feet of stream resource. Although encouraged in some cases, grassed filter strips will not be a required practice accompanying stream bank stabilization restorations.

Fencing: Cost share assistance of 25% will be offered to landowners to fence additional paddock areas for improved pasture and turnout management at equine operations. Woven fence at an the Ohio NRCS construction cost estimate rate of $1.99 per linear foot will be targeted to horse owners and operators with paddocks and pasture areas within 200 linear feet of a stream or wetland resource. The project goal is to install 7,200 linear feet of fencing to establish 2 additional paddock or turnout areas approximately 60 feet by 60 feet that can be properly rotated and managed to retain vegetative cover reducing exposed soils to erosion. Landowners are eligible for up to 3,600 linear feet of fence per property or operation.

Technical Assistance
CRWP, Lake and Geauga SWCD staff will provide technical assistance to landowners to facilitate the implementation of eligible BMPs. Initial site assessment, resource impact evaluation, sediment reduction calculations and conceptual plans will be developed by the technical staff ofLakeand Geauga SWCDs with assistance from CRWP staff. Final stream restoration designs will be developed by a qualified design firm.

BMPs
Name: Stream Bank Stabilization
Type: Engineering Practices
Acres: 1
Cost: $135,000

Description:
Stream bank stabilization utilizing soft engineering practices. Restoration practices will be designed and constructed using approved natural channel design techniques and specifications. 1,800 linear feet of stream bank stabilization is proposed.

Start Date: October 2012
End Date: September 2015

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Incentive Method: 75% cost share
Incentive Rates: $75 per linear foot
Total Soil Savings: 1800

Name: Heavy Use Pad
Type: Engineering Practices
Acres: 0
Cost: $19,620

Description:
Heavy use pad minimum size of 60 feet by 60 feet per practice. Heavy use pad practices shall meet Ohio NRCS standard and specifications in the NRCS Field Engineering Handbook - Code 561. 21,600 square feet of heavy use pad area is proposed.
Start Date: October 2012
End Date: September 2015
Incentive Method: 50% cost share
Incentive Rates: $1.09 per square foot
Total Soil Savings: 250

Name: Grassed Filter Strip
Type: Engineering Practices
Acres: 6
Cost: $1,812

Description:
Warm or cool season grassed filter strip minimum width of 25 feet. Grassed filter strip practices shall meet Ohio NRCS standard and specifications in the NRCS Field Engineering Handbook - Code 393. 6 acres of grassed filter strip is proposed for completion.

Start Date: October 2012
End Date: September 2015
Incentive Method: 25% cost share
Incentive Rates: $302 per acre
Total Soil Savings: 820

Name: Fencing
Type: Engineering Practices
Acres: 1
Cost: $14,328

Description:
Woven fencing for minimum 60 feet by 60 feet paddock or turnout.
Start Date: October 2012
End Date: September 2015
Incentive Method: 25% cost share
Incentive Rates: $1.99 per linear foot
Total Soil Savings: 108

Media Campaign
Kickoff:

CRWP will host a kick off meeting for this watershed scale program. Representative Steven LaTourette and Senators Sherrod Brown and Rob Portman will be invited along with local elected officials from 13 Townships, Villages, and Cities, County Commissioners from both Lake and Geauga Counties, the local print media, and Ohio Commissioners to the Great Lakes Commission, including alternates. At this meeting, CRWP will present on the need and rationale for the project, provide information about streambank stabilization and agricultural best management practices. This event will be organized in cooperation with Lake and Geauga SWCDs, NRCS representatives, the Farm Bureau and the CRWP Member communities within the Lower Chagrin and East Branch watersheds. To begin our outreach campaign, CRWP will send letters to all agricultural property owners and operations in these watersheds to introduce them to the project and invite them to participate in this program. Direct mailing will also be sent to property owners with streams in the targeted drainage area of 2 square miles and smaller to gauge interest in information about streambank stabilization. CRWP and SWCD staff will follow up these letters with site visits to interested property owners.

Ongoing:
Regular communication will occur between CRWP, SWCDs, conservation organizations, park districts, and officials from local communities regarding the project. CRWP will create newsletter articles regarding the project status and provide them to the communities in the watershed for distribution to residents. A project page will be created on CRWP's website (http://www.crwp.org) describing the streambank stabilization and agricultural BMP projects and lessons learned in the process. In addition, project updates will be provided at quarterly CRWP Board of Trustees meetings, which are attended by representatives from 37 Lake Erie Basin communities and park districts.

End:
A press release will be issued at the completion of the project detailing the work completed and project partners. This release will include links to CRWP and SWCD websites for more information. All print materials, outreach to landowners, presentations, project design details, and photographs along with a project summary will also be placed on CRWP's website.

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