

Great Lakes Basin Program GLRI Project

Streambank Stabilization of Griswold Creek

Size: small scale
Grant Amount: \$30,000
Year awarded: 2012

Sponsor: Chagrin River Watershed Partners, Inc.
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Submitted Project:

Size: smallscale
Budget: \$30,000
Savings: 1,360

Background

Sediment Sources

The Chagrin River watershed drains 267 square miles 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)*. Sediment impacts habitat suitability for aquatic life in the Chagrin watershed and is 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, poorly controlled construction sites, suspended solids carried from stormwater runoff, and runoff from agricultural lands in the watershed. The approved TMDL also notes that "Urbanization in some areas of the watershed has resulted in altered stream hydrology, flashy flow regimes, streambanks denuded of riparian vegetation and has exacerbated nutrient enrichment and sediment production, which impacts aquatic life."

This proposed project targets Griswold Creek, a tributary to the Chagrin River at river mile 23.82, which is severely eroding its stream bed and banks causing excessive sediment inputs to the State Scenic Chagrin River (see attached map) and ultimately Lake Erie. The Chagrin River Watershed Partners, Inc. (CRWP) and Geauga Soil and Water Conservation District (SWCD) have noted historic flooding and erosion concerns on many properties along Griswold Creek. In 1989-1990 two privately owned dams were breached. These dam breaches, along with impacts from at least 6 lowhead dams and additional development in the watershed, have caused downcutting and excessive erosion in multiple locations due to changes in stream hydrology.

Numerous areas of Griswold Creek exhibit channel instability through streambank erosion and downcutting stream channels attributed to suburban development and hydromodification. The TMDL target for total suspended solids (TSS) in headwater streams of the Chagrin River watershed is 17 mg/L during high flow and 5 mg/L during low flow. All samples taken by Ohio EPA from the closest TMDL sampling site downstream of

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Griswold Creek exceeded the loading limits for TSS, with an average TSS concentration of 27.14 mg/L and a maximum concentration of 123 mg/L. There are no dams on the main channel of the Chagrin River, thus excess sediment loading from Griswold Creek flows directly into Lake Erie in the City of Eastlake. Page 114 of the Chagrin River TMDL specifically notes the restoration and stabilization of Griswold Creek as an implementation action.

Griswold Creek is designated as a cold water habitat (CWH) stream. As a CWH stream Griswold Creek maintains a unique biological community and a cold stream temperature due to significant amounts of groundwater feeding the stream. In 1995 Ohio EPA data determined that 0.9 miles of the stream were only in partial attainment of water quality standards. In 2004, Ohio EPA noted obvious stormwater impacts in the lower reach. At Fairmount Road, Griswold Creek is in partial attainment of the CWH use, however the lower reach at Falls Road is in non attainment. Ohio EPA noted causes of non attainment are habitat alteration and thermal modifications.

The sources of these impairments are discharge from the WWTP, suburban development, streambank modification, removal of riparian vegetation and nonpoint source stormwater runoff. Griswold Creek is home to the Redside dace (*Clinostomus elongates*), a declining fish species in Ohio. The Redside dace favors slow-moving cool, clear headwater streams with good riffle/pool development and overhanging riparian vegetation such as grasses, forbs, and low shrubs. The species is declining in Ohio and has dwindled in many areas of its range, including the Great Lakes. The Redside dace is listed as endangered in Indiana and Ontario, as threatened in Michigan, and as special concern in Wisconsin. Stabilizing streambanks throughout the Griswold Creek subwatershed will reduce sedimentation, moderate thermal modifications through shading, and provide the optimal habitat for this declining species. In addition, steelhead trout, introduced by ODNR, have been observed spawning in the lower reaches of Griswold Creek. Ohio EPA noted that Griswold Creek has exceptional habitat, declining species, and a high level of biological integrity.

CRWP and Geauga SWCD have been asked by numerous property owners to make recommendations regarding erosion on their property along Griswold Creek. Several landowners have attempted to address streambank erosion issues; however, these small scale fixes are often impacted by stream flows and have not been effective. After much discussion of the concerns and possible solutions, local communities and residents determined that there is both a need and an interest in developing a strategic watershed approach to promote a stable stream channel and provide sustainable solutions to streambank erosion and flooding. This project proposes to stabilize 444 linear feet of streambank along Griswold Creek using bio-engineering methods. This streambank stabilization is predicted to result in 68 tons per year sediment reduction, based on a severe lateral recession rate in silt loam soils. Assuming a 20 year life span of the streambank stabilization efforts, this project will result in the reduction of 1,360 tons of sediment to the Chagrin River and Lake Erie. In addition, this project will reduce erosive flows along Griswold Creek that will minimize erosion on the mainstem of the Chagrin River resulting in lower downstream streambank erosion and sedimentation rates.

Readiness to Implement Project

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 37 Members in 2012, representing 99% of the watershed.

CRWP worked with Russell Township Trustees to submit a Lake Erie Protection Fund (LEPF) grant from the Ohio Lake Erie Commission in early 2012 (anticipated award date June 6, 2012) to complete a survey of stream cross sections to assess stream downcutting and bank erosion sites and develop conceptual stream restoration designs that may include expanded floodplain storage and conveyance areas, or bank and channel stabilization measures. This grant will also include stakeholder meetings with stream owners to provide

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information to property owners and to connect with potential contractors. This Great Lakes Basin for Erosion and Sediment Control grant will allow CRWP and Geauga SWCD to work with interested property owners and provide technical expertise and cost share for these streambank stabilization efforts. The LEPF grant will refine the selection of possible streambank stabilization and provide the design for these stabilization efforts. CRWP anticipates that these projects will require Section 404 Nationwide Permits from the US Army Corps of Engineers prior to construction. CRWP will work with property owners to complete and submit all permitting requirements. Geauga SWCD manages the water management and sediment control regulations in Geauga County and will ensure that sediment is managed throughout construction.

CRWP, Geauga SWCD and local communities have been in direct contact with over 10 property owners who own over 2 miles of the mainstem of Griswold Creek and an additional mile of headwater tributaries and who have expressed interest in stabilizing their streambanks and minimizing erosion. CRWP and Geauga SWCD will continue to work with property owners through the implementation of the LEPF grant to complete stream surveys and develop restoration design details. Landowners have indicated their willingness to participate and complete stabilization projects that will be informed by the work completed with the LEPF grant. This proposal allows CRWP and Geauga SWCD to offer additional technical and permitting assistance and financial incentive through cost share to complete streambank stabilization projects.

CRWP has successfully completed fund raising for numerous watershed projects, including assistance to our Member communities with acquiring and managing 319 grants and Ohio EPA Surface Water Improvement Fund grants to complete stream restoration and stormwater retrofit projects. CRWP receives funding from all 37 CRWP Member communities and park districts each year and has received the following grants over \$25,000 within the past three years:

\$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

As noted above CRWP will work closely with Geauga SWCD staff on property owner outreach and by providing technical assistance and conceptual plans to property owners on effective streambank stabilization projects. In addition, CRWP will continue to work closely with the communities and park districts in the Griswold Creek watershed including Russell and Chester Townships, the Village of Hunting Valley and the Geauga Park District. In addition, CRWP works with the communities throughout the Chagrin River watershed

on development regulations that protect water resources. In HUC 041100030402, Russell Township, Hunting Valley, Moreland Hills, Orange, Pepper Pike, Woodmere, and Willoughby Hills have adopted riparian setback regulations.

All of the communities in this HUC have erosion and sediment control and comprehensive stormwater management regulations. Gates Mills, Hunting Valley, Moreland Hills, Orange Village, and Willoughby Hills have conservation development codes. CRWP will continue to encourage these communities to further pursue the adoption of regulations to protect natural resources, which will also implement the Chagrin River Watershed Balanced Growth Plan (http://www.crowp.org/pdf_files/ChagrinRiverBGPlan_20091210.pdf). The state-endorsed Chagrin River Watershed Action Plan was developed by CRWP in 2006 (http://www.crowp.org/pdf_files/ChagrinRiverWAP_20120217.pdf). Specific sediment reduction BMPs and implementation locations are included in the Plan. Streambank restoration of Griswold Creek using bio-engineering methods is specified on page 100 of the Plan to address habitat impairment and sediment loading. In addition to the information in the Chagrin River Watershed Action and Balanced Growth Plans, CRWP developed a Griswold Creek summary (http://www.crowp.org/pdf_files/Griswold_Creek_Summary20101207.pdf) noting existing land use, historic impacts, water quality, areas of concern, and potential opportunities for stabilization and restoration. This summary was presented to Russell and Chester Townships, Geauga SWCD, and residents to facilitate discussion of issues and was the catalyst to submitting the LEPF grant proposal and this proposal.

Several stabilization projects have already been completed including near the mouth of Griswold Creek at 44001 Falls Road in Hunting Valley, Ohio where erosion resulted in a lateral loss of 40 feet of riparian land in six years. Another private property owner in Russell Township has a pending permit requesting to complete floodplain expansion and streambank stabilization along the stretch of Griswold Creek that runs through their property.

Project Work Area

HUC: 041100030402 - Griswold Creek-Chagrin River, Ohio

Total Area: 48929

Agricultural Area: 6079

Forest Area: 25189

Urban Area: 17661

Priority Areas:

Griswold Creek, a tributary to the Chagrin River, is a severely eroding stream that drains 7.2 square miles. The most prevalent soil in this subwatershed is Mahoning, which has 19-27% clay in the top 8 inches. Griswold Creek begins in Chester Township, flows through Russell Township, and joins the Chagrin River at river mile 23.82 in Hunting Valley. It is in non attainment of Ohio EPA water quality standards over most of the lower reaches. Griswold Creek is designated as a priority conservation area in Russell Township and Hunting Valley, and is a coldwater habitat stream that is susceptible to erosion and sedimentation. The state-endorsed watershed action plan and approved TMDL both note the need for stream restoration on Griswold Creek. Priority restoration reaches of Griswold Creek will be identified through the restoration planning conducted with Ohio Lake Erie Commission's LEPF grant but will be located from Dines Road at river mile 3.15 in Russell Township to the mouth of Griswold Creek to the Chagrin River in Hunting Valley.

Implementation

Implementation Strategy

Beginning in July 2012, CRWP and Geauga SWCD will work with Russell Township to implement the pending LEPF grant which will engage property owners along the project priority area, complete cross sections of stable stream sections to establish reference reaches, and detail conceptual stabilization and restoration

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projects. Through this project, the project team members will identify the highest priority stabilization/restoration projects and gauge interest and commitment of property owners.

October –December 2012:

Great Lakes Basin Kick-off event and Stakeholder meeting
Finalize engineering drawings of stream restoration designs
Develop and distribute initial outreach materials to property owners throughout Griswold Creek.

January 2013-March 2013

Identify priority stabilization projects by identifying willing landowners with the most severe erosion for the cost-share opportunity for restoration.
CRWP will enter into contracts with property owners for access and construction.

April 2013-June 2013

CRWP will engage a qualified construction contractor through a competitively advertised process.
CRWP and Geauga SWCD will work with property owners to obtain permits for proposed restoration activities.

July 2013-September 2013

Begin construction to stabilize 444 linear feet of streambank along Griswold Creek using bio-engineering methods. This streambank stabilization is predicted to result in 68 tons per year sediment reduction, based on a severe lateral recession rate in silt loam soils. Landowners in high priority erosion areas along Griswold Creek will be eligible to apply for 75% cost-share assistance (up to \$56.25/linear foot) for streambank stabilization on their properties. While each site may demand unique streambank stabilization techniques, we anticipate the use of tree revetments, vegetated riprap, regrading stable stream slopes, and planting woody vegetation along the streambanks.

CRWP and Geauga SWCD will inspect and photograph the stabilized streambanks throughout the construction.

October 2013-December 2013

Finalize any planting, particularly dormant postings for streambank stabilization projects.

January – March 2013

Outreach materials including project results will be developed in January 2013 and disseminated in February 2013.

April 2013-June 2013

CRWP and Geauga SWCD will evaluate the effectiveness of the stabilization projects and success of planting. CRWP will offer site tours of project sites to highlight streambank stabilization techniques and project success. Finalize project and disburse information about final project accomplishments through CRWP website and meetings.

Technical Assistance

CRWP and Geauga SWCD staff will provide the technical assistance for this project including presentations to local communities, park districts and residents; provide education on appropriate BMP selection, technical assistance on BMP design, construction, operation and maintenance. CRWP will also obtain technical support through selected subcontractors for BMP design and construction. In addition, this project will leverage technical expertise of Geauga SWCD and local communities through review of construction plans.

BMPs

Name: Streambank Stabilization

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Type: Engineering Practices

Acres: 444

Cost: \$25000

Description:

This streambank stabilization is predicted to result in 68 tons per year sediment reduction, based on a severe lateral recession late in silt loam soils. The BMP life is assumed to be 20 years for a total reduction in sediment loss of 1,360 tons.

Start Date: July 2013

End Date: December 2013

Incentive Method: Cost-share

Incentive Rates: 75%

Total Soil Savings: 1360

Media Campaign

Kickoff:

CRWP will host a kick off meeting in the Griswold Creek Watershed. Representative Steven LaTourette and Senators Sherrod Brown and Rob Portman will be invited along with other local elected officials, 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, identify potential project locations, and distribute project related materials. This event will be organized in cooperation with Geauga SWCD and the CRWP Member communities within the Griswold Creek watershed. To begin our media campaign, CRWP will send letters to all Griswold Creek residents inviting them to the kick-off event and publicly advertise the event for other residents interested in information about streambank stabilization.

Ongoing:

Regular communication will occur between CRWP and officials from Russell Township, Hunting Valley, and Chester Township 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 bank stabilization 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. 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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