

## **Stream and Wetland Mitigation to Reduce Erosion and Sedimentation**

### Problem Statement:

The problems in the Chagrin River watershed include habitat alteration; flow alteration; and thermal modifications (Ohio EPA, 2002). These problems are collectively caused by land development and suburbanization activities in the Chagrin River watershed that have historically lacked effective storm water quality and quantity control; filled headwater streams; channelized watercourses; and filled and drained wetlands. This has resulted in increased flooding, erosion, and water quality problems, including sedimentation, and the export of significant wetland and stream functions as impacts have been mitigated in other watersheds.

While sedimentation was not listed as a cause or source of non-attainment in the monitored segments of the watershed in 1995, the Ohio EPA is in the midst of conducting intensive water quality survey work in the watershed to update this data. It is expected that field work will be completed in 2004, and that attainment status will be fully re-assessed by 2005. Anecdotal information based upon field work conducted in 2004 by the Ohio EPA indicates that problem areas for sedimentation do exist in the watershed that may have an impact on biological communities in the river and affected tributaries (P. Anderson and S. Tuckerman, pers. comm., 2004)

In highlighting sedimentation as a problem in the Chagrin watershed, it is important to note that many sections of the Chagrin were not monitored under Ohio EPA's past sampling approach. Under the Agency's new sampling protocol, they will be examining many smaller tributaries that have not been monitored (P. Anderson, pers. comm., 2004). Information collected by the Lake County Soil and Water Conservation District (SWCD) and the Chagrin River Watershed Partners, Inc. (CRWP) through stream surveys and construction site inspections indicate that sedimentation is a problem in these smaller subbasins. Basins of concern include Ward Creek and Corporation Creek in Lake County, Boulder Creek in Cuyahoga County, and tributaries to the Upper Main Branch in Geauga County. These streams are exhibiting the impacts of development and increased sedimentation including active bank erosion, loss of floodplain access, and embedded substrates (M. Scharver, pers. comm., 2004).

In addition to these impairment problems, several issues hamper restoration efforts and further promote the export of the erosion and flood control functions of wetlands out of the watershed. These include:

- A lack of understanding among riparian and wetland landowners of the flood control, erosion control, and water quality protection services provided by their streams and wetlands and options available for protecting and improving these resources.
- A lack of readily identified stream and wetland mitigation projects in the watershed.
- A lack of landowner resources to perform restoration.

## Project Goals

CRWP will minimize the impacts of development activities, including erosion and sedimentation, in the Chagrin River watershed through a combination of headwater stream landowner education and facilitation of stream and wetland restoration. This will be accomplished through the following measurable goals:

- Mail biological and water quality data about the streams on their property and recommendations for maintaining or improving these streams to approximately 150 landowners in Upper Main Branch of Chagrin River. This will include all properties on which CRWP conducted previous headwater stream surveys as well as upstream and downstream landowners.
- Mail information to community officials in Kirtland, South Russell, Chagrin Falls, Bainbridge, Chester, Russell, Newbury, and Munson detailing stream conditions and contacted property owners.
- Host two (2) workshops. One workshop will be for interested landowners to provide information on mitigation options, processes, and procedures. The second workshop will be for the development community to present CRWP's work to match the need for stream and wetland mitigation with available projects.
- Identify approximately 2,000 linear feet of stream restoration and 6 acres of wetland restoration projects to reduce the export of wetland, stream, and floodplain functions from the watershed as land is developed.

Through this combination of targeted landowner education and identification of potential mitigation projects, CRWP will assist in maintaining and improving streams and wetlands in the watershed and minimizing the export of the flood control, erosion control, and water quality protection services these resources provide. Additionally, by focusing restoration efforts on replanting riparian corridors, maintaining setbacks from streams, and restoring wetlands and floodplains, this project will mitigate sediment loads, minimize erosion, and assist in maintaining stable stream geomorphology in the watershed.

## Proposed Work

### **Background/History**

CRWP was formed in 1996 by watershed communities to provide technical advice and assistance on innovative methods to address and minimize flooding, erosion, and water quality problems as communities develop. CRWP works directly with the elected officials, engineers, law directors, and planners in 32 member communities to update zoning and subdivision codes, review proposed development projects, and protect critical open spaces. In addition to these direct member services, CRWP conducts watershed initiatives to increase the level of understanding about the structure and function of the

Chagrin River watershed and to support member communities as they adopt innovative controls on new development.

In 2003 CRWP initiated two watershed initiatives with the support of the Ohio Department of Natural Resources, Coastal Management Program. The first project assessed the cumulative impacts of land development on headwater streams. Through this project CRWP sampled sixty headwater streams in the Upper Main Branch of the Chagrin River. The Upper Main Branch is the most recent section of the Chagrin to receive State Scenic River designation. Under the second project CRWP began a survey of potential stream and wetland mitigation sites. This project, representing the first phase of an overall effort to develop a watershed inventory of potential mitigation sites, focused on mitigation opportunities on properties already protected through park districts and conservation easements.

With the completion of these two watershed initiatives, CRWP proposes under the Great Lakes Basin Program for Soil Erosion and Sediment Control to expand this work to include targeted landowner education to those in the Upper Main Branch already contacted through the headwater stream survey and to expand the mitigation site inventory to include mitigation opportunities on private property. Through the headwater stream survey it was clear that many such opportunities exist and that promoting small mitigation projects distributed throughout the watershed will mimic the natural hydrology that may have been compromised as an area was developed. As most of the property in the Chagrin River watershed is privately owned, it is imperative that we look to private property owners for maintenance and improvements to our streams and wetlands in order to control erosion and sedimentation.

Our proposed project will be accomplished through the following steps:

**GOAL 1A:** Mail biological and water quality data about the streams on their property and recommendations for maintaining or improving streams on their property to approximately 150 landowners in Upper Main Branch of Chagrin River. This will include all properties on which CRWP conducted previous headwater stream surveys as well as upstream and downstream landowners.

CRWP will develop and distribute information packets for private property owners on headwater streams. These mailings will include:

1. The type of fish, salamander, and macroinvertebrate species found in their stream and what those species indicate.
2. Recommended improvements for impacted streams, or maintenance steps for stable streams. This will include information on stream stewardship using the series of six fact sheets developed by the Cuyahoga SWCD.
3. Information on Ohio EPA Headwater Initiative using Ohio EPA Fact Sheets including *The Importance and Benefits of Primary Headwater Streams*, *Ohio EPA's Primary Headwater Stream Project: Key Findings*; *Economic Reasons for Sound Management of Primary*

*Headwater Streams; and Nonpoint Source Impacts on Primary Headwater Streams.*

**GOAL 1B:** Mail information to community officials in Kirtland, South Russell, Chagrin Falls, Bainbridge, Chester, Russell, Newbury, and Munson detailing stream conditions and contacted property owners. Information to elected officials will include:

- The Ohio EPA Headwater Habitat Evaluation Index Class of sampled streams and explanation of classes,
- Contacted property owners,
- Ohio EPA and Cuyahoga SWCD fact sheets sent to property owners,
- Recommended management options,
- Jurisdiction maps with sampled streams noted.

Through our previous sampling efforts on these headwater streams we have worked closely with the targeted landowners and elected officials. As a result, we have an established working relationship on which to build these further educational efforts.

**GOAL 2:** Host two (2) workshops. The first workshop will be for interested landowners to provide information on mitigation options, processes, and procedures. The second workshop will be for the development community to present CRWP's work to match the need for stream and wetland mitigation with available projects. In preparation for these workshops we will:

- Determine regulatory barriers to proposed combinations of restoration, enhancement, and preservation options for mitigation credit.
- Develop cost estimates for necessary transaction, construction, and monitoring agreements.

**GOAL 3:** Identify approximately 2,000 linear feet of stream restoration and 6 acres of wetland restoration projects to reduce export of wetland, stream, and floodplain functions from the watershed as land is developed. To complete this goal, we will build on our contacts in the Upper Main Branch under Goal 1 and:

- Develop a GIS database to identify riparian landowners, potential restoration and/or preservation projects, and contact information.
- Canvass identified landowners through direct mail and phone contacts.
- Canvass member community engineers for potential sites.
- Issue one (1) press release regarding the project and the potential for landowners to participate in efforts to restore their stream or wetland.
- Once sites are identified, provide one-on-one facilitation for mitigation projects to assist property owners with design, permitting, budgets, monitoring agreements, and deed restrictions or conservation easements.

It is important to note that CRWP is not attempting to establish a formal mitigation bank in the Chagrin River watershed through this project. Our research and work to date indicates the high transaction costs associated with mitigation and restoration in the

Chagrin. These costs are due to high land costs and the lack of large mitigation and restoration opportunities. These costs are resulting in a significant export of wetland and stream functions from the watershed. For example, our study of historic versus current wetland recourses indicates that 80% of the Chagrin River's wetlands have been lost (CRWP, 2002). This project is an attempt to limit this loss and increase viable streams and wetlands in the watershed.

### **Project Personnel:**

Kyle Dreyfuss-Wells, CRWP Executive Director

Project oversight: review all correspondence, reporting, and budgeting.

Ms. Dreyfuss-Wells oversees all operations at CRWP, including member assistance, grant procurement, management, and budgeting.

Amy Holtshouse, CRWP Program Assistant

Project manager: draft all correspondence, manage database, collect, and coordinate technical information, organize workshops, and work with selected consultant in preparing landowner outreach and workshop content.

Ms. Holtshouse acted as project manager for the headwater stream and mitigation identification projects funded by ODNR and the Chagrin River Tree Revetment project through the Ohio EPA 319 grant program.

Linda Moran, CRWP Administrative Assistant

Procure supplies, facilitate mailings, arrange and setup workshops.

Ms. Moran handles all administrative tasks at CRWP including coordinating Board meetings and various workshops.

### **Regional Collaboration:**

CRWP will work with all of the following partners on wetland and stream mitigation projects. We will also specifically work with these partners as detailed below:

**Cuyahoga SWCD:** CRWP will use the District's *Life at the Water's Edge* series of six fact sheets in outreach and mailings to landowners and public officials and at the workshops.

**Chagrin River Land Conservancy (CRLC):** CRLC will hold any conservation easements necessary on stream and wetland mitigation projects. The Cuyahoga, Geauga, and Lake SWCDs may also hold these easements.

**Geauga SWCD:** We will work with Geauga SWCD on landowner and public official outreach in the Upper Main Branch of the Chagrin and will coordinate on stream and wetland site identification and project development.

**Lake SWCD:** Lake SWCD completed headwater stream surveys for the Lake County portion of the Chagrin. We will coordinate public education materials and site identification.

**Ohio Wetlands Foundation:** We will coordinate, where appropriate, to facilitate restoration designs, permitting, and monitoring of specific stream and wetland mitigation projects.

**Ohio EPA:** We will rely on Ohio EPA's Headwater Initiative Fact Sheets for outreach and mailings to landowners and public officials and workshop materials. We will continue to work with Paul Anderson as the Agency completes the Total Maximum Daily Load (TMDL) study of the Chagrin watershed.

**Other Funding Sources:**

CRWP will provide thirty-four percent (34%) matching funds for implementation of this information and education project.