

# Great Lakes Basin Program GLRI Project:

## Auglaize River Riparian Restoration

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

**Sponsor:** City of Defiance  
**Address:** 631 Perry Street  
**City:** Defiance  
**State:** OH  
**Zip:** 43512

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### Submitted Project:

Size: smallscale  
Budget: \$30,000  
Savings: 12,996

### Background

#### Sediment Sources

The Maumee River Basin is a major contributor to the sediment loadings into Lake Erie. While the primary land use and most likely source of sediment in the Eagle Creek - Auglaize River Watershed is from agricultural land use practice, the urban landscape near the confluence of the Maumee and Auglaize Rivers is experiencing severe erosion. This localized stream bank erosion is actively contributing to the major problem of sediment loading in the Western Lake Erie Basin.

### Readiness to Implement Project

- Engineering plans including construction drawings have been issued for the embankment stabilization portion of the project. The riparian buffer planting is included at a conceptual level on the construction drawings. The planting portion of the stream bank stabilization will be completed as a separate, yet complementary project once the engineering work has been completed. Technical assistance will be enlisted to ensure the revegetation plans are complete and sufficient to meet soil loss reduction goals. Work will be performed and plans prepared under the guidance of the City Engineer's Office.
- The US Army Corps of Engineers has issued a Nationwide Permit for the project.
- The property is owned by the City of Defiance and therefore no easement is required.
- The City has received a grant for approximately \$50,000 from Ohio Department of Natural Resources Forestry Division for removal of ash trees and canopy replacement due to the Emerald Ash Borer during 2010.

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- The City of Defiance has developed a long-term partnership with the Defiance Soil & Water Conservation District for the management of the City's Municipal Separate Storm Sewer System (MS4) resulting in the position of Urban Stormwater Program Coordinator. This position has resulted in a proactive effort to implement erosion and sediment control practices and initiate projects such as this riparian buffer planting that will result in long-term sustainable improvements to the City and ultimately to the Region's greatest asset, Lake Erie. Additional partnerships for this project providing assistance with public outreach and education include the following groups: Maumee River Basin Partnership of Local Governments (MRBPLG) and Downtown Development & Visitors Bureau (DDVB). Finally, the following partners provide ongoing support in their respective area of expertise to the City's Urban Stormwater Program: Katie Rousseau, Associate Director of Clean Water Program at American Rivers Great Lakes Office; Stephanie Miller, Regional Urban Forester at Ohio Department of Natural Resources (ODNR); Roger Herrett, Service Forester with Ohio State University Extension (retired) and John Mathews, Urban Stormwater and Stream Specialist with ODNR, Division of Soil and Water Conservation.
- This project is not a part of any state approved written plan, as there is currently no TMDL or Watershed Action Plan for the Auglaize River Watershed and/or the Maumee River Basin. This site was specifically selected due to the severity of the problem and need to implement a BMP that will create long-term stability for the project site. There are several other locations throughout the City of Defiance where stream bank stabilization projects are being conducted and/or proposed on a smaller scale. This recent effort to provide stream bank stabilization is a part of the City of Defiance long-term strategic plan to provide more access and visibility to the rivers. This goal has resulted in the realization that there is a significant amount of work to be done in order to properly conduct maintenance and stabilization activities on the stream and river banks. The use of bioengineering as a strategy for revegetation and bank stabilization is relatively inexpensive and fairly low-tech to install. It is with this in mind that the project is intended to be replicable for public and private landowners to maintain and stabilize other stream and river bank areas throughout the watershed.

### **Project Work Area**

HUC: 041000071209 - Eagle Creek-Auglaize River, Ohio

Total Area: 21914

Agricultural Area: 14470

Forest Area: 2857

Urban Area: 3193

### **Priority Areas:**

This is a site specific project that will focus on soil loss reduction on the west bank of the Auglaize River near the confluence with the Maumee River between Second Street and Fort Street. The length of the riverbank is 713' long with a slope length that ranges between approximately 20' – 40'. Soil loss estimates are generated using the average of 30'. The river bank is experiencing severe erosion and sloughing with an estimated Lateral Recession Rate of 0.5 based on field observations. Field conditions presently include bare ground, active undercutting and loss of large trees as well as significant root exposure on existing small trees on the face of the bank.

The project site is not upstream from a significant dam.

### **Implementation**

#### **Implementation Strategy**

This specific stream bank stabilization project is unique because it will be done with bioengineering techniques complemented with planting of containerized trees that will be at least 1" diameter at breast height (dbh). The

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planting of live stakes on 3' centers throughout the entire face of the bank will not only mitigate severe soil losses that are currently taking place, but also demonstrate best management practices for public and private landowners. These bioengineering stabilization practices are consistent with the goals of riparian restoration, providing long-term protection of ecological habitat and water quality improvements in the Western Lake Erie Basin. The adjacent downstream parcels have been stabilized with a concrete retaining wall which does reduce soil losses; however, it does not provide the myriad benefits of a vegetated riparian buffer. The planting of shrub-type live stakes during the first year will be complemented by planting of select native hardwood trees during the second growing season in order to allow the live stakes to become established and significantly reduce soil losses and movement. The City will hire a contractor to do the installation of live stakes and tree planting, working with them for the duration of the project to ensure effective completion. It is anticipated that ongoing replanting efforts will be required to ensure long-term stabilization that will be completed during year three and/or as needed throughout the duration of the grant project until complete establishment is achieved.

### **Technical Assistance**

Technical assistance will be provided in the form of consultation with a certified Landscape Architect (LA) or technically qualified consultant that has experience with bioengineering practices. The City will select a LA based on the City's standard Quality Based Selection Practices. A scope and fee will be negotiated with the selected LA not to exceed \$5000 for the duration of the project. Project partners will also be active in the technical review and assistance phase in order to ensure a well-rounded approach before planting and throughout the public outreach/media campaign.

### **BMPs**

Name: Streambank Bioengineering Stabilization

Type: Agronomic/Cover-based

Acres: 0

Cost: 21000

### **Description:**

Install 3000 shrub-type live stakes and 60 native containerized trees over approximately 21,000 square feet in order to stabilize the vertical face of the river bank. The planting process will begin after the structural stabilization at the toe of the slope is complete (see next BMP section for a description of structural engineering practices). As the ideal time to plant live stakes is the dormant season, the competing bids would be received no later than December 2012 and the planting would happen no later than February 2013, based on weather conditions. This form of bioengineering is expected to generate very extensive cover in a relatively short time frame in order to halt the severe erosion and sloughing that is occurring on the face of the river bank. It is expected that the face of the bank above the berm may continue to shift, settle and erode for one (1) to three (3) years after the rock berm has been built; however, the more vegetation that is present, the more stable the face of the river bank will become and therefore greater soil loss reduction will be accomplished. The approximately 1" diameter at breast height (dbh) native trees will be planted in year two, allowing for a full year of growth on the live stakes in order to slow and reduce continued soil movement. Replanting of any trees and live stakes that did not reach establishment will be completed in year three as a final step in the revegetation process. The active erosion happening on this river bank is a combination of 1) sheet or rill erosion from surface runoff and 2) lateral undercutting of the bank by the river action. While the practices are complementary, in order to distinguish between the two soil loss reduction goals it was necessary assign estimates for each distinct practice as follows: the bioengineering BMP described above is intended to mitigate the surface runoff, while the structural engineering BMP described below is intended to address the river action. These assumptions are reflected in the BMP calculations for the respective soil loss reduction goals.

The total size of the BMP area is approximately 0.48 acres.

Start Date: November 2012

End Date: February 2015

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Incentive Method: n/a  
Incentive Rates: n/a  
Total Soil Savings: 5199

Name: Streambank Structural Stabilization  
Type: Engineering Practices  
Acres: 0  
Cost: 226000

**Description:**

The structural stabilization to be completed on this river bank has been recommended and designed by the Chief Engineer at Bowser Morner in Toledo, OH. The primary objective of this BMP is to create a stabilizing berm at the toe of the slope in order to discontinue the erosion and soil loss from river action. In the project area the soil is composed of silty clay glacial till deposit over bedrock. There is a thin sand or silt layer present just above the bedrock which is softer than the bedrock stream bed and therefore the river preferentially erodes laterally into the bank. This practice will be installed by a contractor to be hired by the City of Defiance, through the standard bid proposal and contract for services at a pre-bid estimate of \$226,000. This is being funded entirely through the City General Fund. Although no funds are being requested for this portion of the stabilization project, it does positively impact the overall soil loss reduction goal and provide a solid foundation for the bioengineering practices described above being proposed for the grant funding request on the face of the river bank. The erosion that will be reduced from this BMP is calculated separately from the soil loss reduction goals for the bioengineering/revegetation BMP.

Start Date: July 2012  
End Date: September 2012  
Incentive Method: n/a  
Incentive Rates: n/a  
Total Soil Savings: 7797

**Media Campaign**

Kickoff:

The City of Defiance will hold a project kickoff event at the Auglaize River project site. At that time the berm stabilization will be complete and the focus of the kickoff event will be on the revegetation/planting plan to create a riparian buffer. Present at the meeting will be City Engineering Staff, the engineering firm of Bowser Morner and any firm that may provide technical review and/or consultations during the process. A permanent access ramp will be constructed prior to this event and therefore it will be possible to walk down to the water's edge to showcase the work that has been completed as well as the bioengineering practices that are being proposed to restore the riparian buffer. All required invitees will be notified in advance of the meeting as well as the general public will be invited to attend, with a special emphasis on attracting landowners who own property along any of the local rivers or streams.

Ongoing:

This is an opportunity to encourage the many landowners in and around the City of Defiance to use best management practices while maintaining the stream banks on their own property. The public outreach emphasis is on demonstration of bank maintenance and stabilization techniques that can be replicated on public and private property along the Tiffin, Maumee and Auglaize Rivers as well as their tributaries. A fact sheet and complementary brochure will be developed as part of the media campaign to provide "Landowner Stream Maintenance" guidance. The firm or person selected to provide technical assistance for the site specific BMP will also provide guidance for the ongoing public education component. As a member of the MRBPLG watershed group, which is comprised of many municipalities that promote water quality and water infrastructure issues within and around the Maumee River Basin, the City will use this outlet to promote our

efforts throughout the region. The Downtown Development and Visitors Bureau (DDVB) is an effective partner for providing communication to the local residents and business owners. DDVB is also spearheading a new project that will result in a “Rivers Committee”. This is also a part of the long-term strategic plan that will allow the City to promote and provide more access and visibility to the rivers. The public outreach activities and media campaign are complementary and will allow the City of Defiance to simultaneously meet the soil loss reduction goal on a specific location with an acute problem, as well as use this as a demonstration of a replicable BMP, while keeping the general public and community officials involved and aware of the progress of the project outcomes. For the long-term it will also allow the City’s Urban Stormwater Program and Engineering Division to provide proper guidance and technical assistance for landowners who intend to maintain and stabilize additional stream bank locations throughout the City and the surrounding Maumee River Basin.

End:

The public outreach/media component of this project will be completed with a public celebration to be held at the project site after the vegetation has become established and the physical results of the revegetation and stabilization are apparent. As with the kickoff event it will be possible to use the access road that will be built as part of the stabilizing berm in order to walk safely down to the water’s edge. This will provide an opportunity for public officials, local residents, project partners as well as the staff and consultants who have been involved in the project to have a hands-on experience while observing the completed project site, a well-established and stable river bank. This event will coincide with another to be determined event in the downtown Defiance area, such as the DDVB sponsored “First Friday” or one of the other festival events such as the Lilac Fest or the Rib Fest – based on timing of project completion and weather considerations. This effort to coordinate with an established event will allow for a broader spectrum of residents to become aware of the project benefits than would an isolated event to showcase the project. This will be complemented by a press release regarding project completion in advance of the event.

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