



## Weber Stream Restoration Initiative Progress Report & Prospectus, June 28, 2010

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### Background

In 2005 Mr. Ron Weber provided a gift to the University of Minnesota Duluth's (UMD) Natural Resources Research Institute (NRRI) to fund activities to improve the water quality of Lake Superior tributary streams. The Weber Stream Restoration Initiative (WSRI) is dedicated to implement best management plans, provide information on stream conditions to resource managers and the public, and to evaluate policies and opportunities that lessen the impact of human development within North Shore watersheds. ***The goal of the Weber Stream Restoration Initiative is to enhance habitats and biodiversity in Lake Superior tributary streams by protecting and restoring watersheds along Minnesota's North Shore.***

Since its inception the Weber Stream Restoration Initiative has been guided by the principle that protection and restoration of North Shore streams will only be successful if both the root causes of damage, as well as the symptoms of disturbance are addressed. Therefore, one of the driving forces behind the Weber Initiative has been the development and support of the North Shore Stream Consortium (Table 1), which has successfully engaged a variety of professional resource managers, academic scientists, and the public in cross-disciplinary communication about ongoing activities in North Shore watersheds. This collaboration has identified specific disturbances and is developing long-term solutions for restoring the habitat and biodiversity of Lake Superior tributary streams. To that end, projects (Table 2) have been initiated to:

- remediate and restore stream habitat in the Lester-Amity and other North Shore streams and watersheds, and evaluate the effectiveness of individual practices,
- develop a comprehensive database of past studies of North Shore streams to provide historic context and reduce duplication of effort,
- collect new data to fill knowledge gaps, and
- engage the public in a campaign to communicate links between human activities and water quality impacts.

Weber Initiative accomplishments go far beyond securing outside resources made possible by leveraging the endowment dollars and in-kind support. NRRI scientist's involvement in local water boards and technical committees as Weber Initiative representatives reflect our goal of working on water quality issues over a broad scale. The willingness of local organizations to partner on projects, reflected by the more than 60 letters of support that have accompanied the 27 proposal submissions since 2005, is a testament to our continued dedication of improving North Shore stream and coastal Lake Superior conditions.

### Summary of Current Projects

Funding sources: Externally funded grants (almost \$2M) leveraged from the WSRI Endowment supported the following activities:

## Major construction activities

### 1. East Branch (Upper) Amity Creek bank stabilization: (2008-2010)

- Restoration Lead Agency: S. St. Louis Soil & Water Conservation District
- Construction phase completed Fall 2009
- Tree planting and revegetation work began in May 2010 and will continue in Sep 2010 (see new projects below)
- Performance monitoring and assessment ongoing but not funded beyond Dec 2010



### Post –construction



**2. Lower Amity Creek - Graves Road Creek retrofit and bank stabilization: (2005-2010)**

- Restoration Lead Agency: City of Duluth Engineering Department and Stormwater Utility
- Construction phase completed Fall 2009
- Tree planting and revegetation work awaiting new Great Lakes Restoration Initiative funding in Sep 2010 (see below)
- Performance monitoring and assessment ongoing but not funded beyond Jun 2011.

**2. Graves Road Creek restoration (Lower Amity)**



**Post –construction**



### 3. Lakeside demonstration project - residential runoff & retrofit: (2008-2011)

- Restoration Lead Agency: City of Duluth Stormwater Utility in collaboration with NRRI, MN Sea Grant, and S. St. Louis Soil & Water Conservation District
- Construction phase completed Jul 2009
- Performance monitoring and assessment ongoing but not funded beyond about Nov 2010



### 4. Additional Weber Stream Restoration Initiative Activities at a Glance

- Assessment of home owner storm water runoff reduction practices (2009 and 2011)
- Education and outreach activities via [www.lakesuperior.org](http://www.lakesuperior.org) website (ongoing)
- Community planning and zoning: comparing visions of the future under different water resource protection regimes – Amity development scenarios (December 2008)
- North Shore Superior trout stream real-time monitoring (through June 2011)
- Superior trout stream water quality, habitat, and invertebrate monitoring for State impairment assessment (data collection ends October 2010)
- Predicting the impacts of development on Lake Superior North Shore streams using high resolution GIS spatial data (June 2010)
- Evaluating road construction/ditch design practices (December 2008; *new GLRI project*)
- Development of an enhanced Low Impact Design toolkit of stormwater practices and case studies targeting designers, builders, planners, and owners about performance, and maintenance and operation costs (through Jun 2011).
- Assisting the MPCA with a comprehensive analysis of erosion and erodibility potentials in North Shore streams (through Jun 2011, but Phase 2 funding to 2013 is in jeopardy)
- EPA's stormwater model SUSTAIN to identify sites for installing low impact development stormwater practices will be calibrated and pilot tested as a demonstration project in the Amity watershed because of the data accumulated via WSRI activities (Apr 2010 start)

## 2010 prospectus

The long-term success of the Weber Initiative is closely linked to further supporting ongoing activities of the North Shore Stream Consortium composed of local units of government, resource management agencies, citizens, and academic scientists involved in the study and management of aquatic resources in the region. The cumulative resources and knowledge provided by these organizations are essential for identifying impairments and evaluating potential management options, prioritizing and implementing management actions, securing funds, and evaluating the success of each project. The Weber Initiative has been instrumental in pursuing funding requests and supporting partner organizations in their areas of expertise by providing both (unencumbered) monetary support, critical non-federal matching funds, and organizational structure to enhance communication among partners. Prior to the Weber Stream Restoration Initiative, member organizations by and large did not have an effective means of communicating about activities of their agencies related to north shore streams.

As of June 2010, awards totaling more than \$900,000 have been received by NRRI that bear directly on the protection and/or restoration of Superior Basin trout streams. Further, a Great Lakes Restoration Initiative (GLRI) grant proposal to the U.S. EPA entitled *Amity Creek Restoration Project* has been recommended for funding and is in final review. This grant totals more than \$843,000 for restoration activities during the period Sep 2010-Jun 2013. The proposal was developed by NRRI in collaboration with the S. St. Louis SWCD, MN Sea Grant, and the Minnesota Pollution Control Agency and is a direct result of the WSRI endowment. It's major elements include:

### **AMITY CREEK RESTORATION PROJECT** (EPA-Great Lakes Restoration Initiative; recommended for funding)

#### *1. Remediation and restoration of 4 sediment sources identified in the 2009 SSL SWCD reconnaissance study.*

(1) *Eroding Banks*: One eroding bank will be stabilized using in-stream flow altering structures and bank slope stabilization. The project site has constraints due to hiking trail, so most of the bank stabilization will be done by diverting flow off of the bank using in-stream structures. The project will be surveyed and designed by SSL SWCD staff. The project will be built by construction sub-contractor.

(2) *Failing Infrastructure (bridges and culverts)*: Several plugged culverts on the Amity Park hiking trail will be repaired, reducing erosion of the trail and sediment laden run-off. In addition the remnants of an old bridge that is impeding flow and causing increased sedimentation of the area upstream will be removed and the area stabilized (City of Duluth staff supervised by SSL SWCD staff).

(3) *Gullies/washouts*: Several washouts have been identified as significant sediment sources to Amity Creek. Further investigation will help choose the worst of these washouts, and determine methods of stabilization.

(4) *Landuse*: An area of publicly owned and University of Minnesota property has been identified as having landuse that contributes excessive run-off to Amity Creek. This project aims to plant approximately 200 trees along 1000' (300m) of the creek's riparian zone. This planting will provide increased shading to reduce temperature, slow run-off from area fields, and stabilize soil and banks.

(5) Revegetation and reforestation of disturbed riparian zones of the 2009 restoration projects: This project would complement the two 2009 bank stabilization and channel modifications accomplished by the WSRI (East Branch and Graves Rd Creek projects). Stabilized banks and shoreline areas totaling ~8 acres will be planted with ~4000 donated native conifers using volunteer labor. A statistical analysis of several weed *competition* and browse control measures will be included in the re-vegetation design for long-term performance evaluation (NRRI-UMD working with the SSL SWCD and NRCS).

2. *Tools for rural stormwater runoff and erosion reduction*

- Application of a model Land Use/ Stormwater Planning Tool (a user-friendly, on-line ARC IMS GIS mapping tool) to Upper Amity Creek watershed township landowners.
- Development of a Ditch Maintenance Manual and Training Workshops for the Superior Regional Stormwater Protection Team (Minnesota and Wisconsin).

3. *Outreach and Education*

All subproject results will be featured on the award winning [www.LakeSuperiorStreams.org](http://www.LakeSuperiorStreams.org) (LSS) website created via EPA funding in 2002 to a Duluth-MPCA-Western Lake Superior Sanitary District-University of Minnesota-Duluth (NRRI and Sea Grant) Partnership. It now includes the South St. Louis County Soil and Water Conservation District (SWCD) and serves as a major outreach & education arm for the Superior Regional Stormwater Protection Team (RSPT). LSS is data-based and provides the public, agencies, and educators in formal and non-formal venues with interactive access to data, interpretive information, and general and technical information related to current stormwater pollution prevention methods.

4. **Not funded:** *Performance assessment of Weber Stream Restoration Initiative turbidity and sedimentation reduction techniques in trout streams.*

Unfortunately, this critical element of the project was not funded because of an EPA decision to not fund most monitoring elements of restoration projects in this first round of GLRI proposals. We believe it is critical to secure funding for this task since baseline data has already been gathered and we do not have funding to assess the performance of the Amity restoration activities beyond early 2011. Data needs include water quality, habitat, bugs and fish. Having baseline data for assessing the success of the restoration work and the overall ecological “health” of the stream is a key factor in the grant proposal evaluation process and so we will actively seek to find alternative sources for funding this work.

Assessment cost estimate: \$155,202 (Lead group: NRRI)

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**ADDITIONAL NORTH SHORE STREAM PROJECTS UNDER CONSIDERATION**

**I. EAST BRANCH AMITY CREEK BANK STABILIZATION**

Stream- East Branch Amity Creek, Duluth, MN

Location- Upstream of Weber Initiative Bank Stabilization Project

**1. Phase II Feasibility**

**Sub Project Objective-** Determine the feasibility of future channel improvement efforts upstream of the Weber Initiative bank stabilization project on the East Branch Amity Creek, Duluth, MN.

**2. Phase II Construction**

**Sub Project Objective** - Provide for improved brook trout habitat along a reach of stream that has been impacted by stream destabilization and beaver ponds. In addition, provide for increased floodplain storage and recharge of spring and peak flows to enhance cold water stream baseflow. Floodplain recharge will also reduce the stream peaks which will reduce stream bank erosion and enhance stream stability.

**Phase 2 cost Estimate: \$87,360** (Lead group: S. St. Louis SWCD)

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**II. Stormwater treatment, water and energy conservation project at the Jean Duluth Soccer Field Complex near Upper Amity Creek.**

**Project objective-** Stormwater runoff treatment, erosion control, water and energy conservation.

**Cost Estimate: \$50-70,000** (Lead groups: S. St. Louis SWCD, City of Duluth, Stark Enterprises, LLC)

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**III. Mitigation of priority sediment sources in the Amity watershed identified in the *Amity Creek Sediment and Erosion Reconnaissance* conducted by the S. St. Louis SWCD in November 2009.**

**Project objective-** Address sediment and turbidity sources identified and photographed in the 2009 SSL SWCD Amity Creek reconnaissance that were not included in the EPA-GLRI grant described above.

**Cost Estimate: \$ unknown but > \$100,000 for all identified sources** (Lead groups: S. St. Louis SWCD, City of Duluth, NRRI)

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#### IV. Chester Creek Restoration

**Project objective-**

- restore 150 m of stream channel to reduce summer thermal stress on brook trout in Chester Creek by removing/modifying a dam, reconstructing the channel, and creating meandering riffle/pool sequences as part of a community based demonstration project within Chester Park, a major recreational area in Duluth. Project would serve as a model for restoration of urban trout streams in the upper Great Lakes Basin.
- disseminate the results of the subprojects and feature them in the outreach and education program of the Western Lake Superior Regional Stormwater Protection Team (RSPT) via on-line (i.e. [www.lakesuperiorstreams.org](http://www.lakesuperiorstreams.org) and partner agency websites) and other venues (existing newsletters, workshops, public meetings, school curricula, conference seminars).

**Cost estimate: \$ 182,649** (Lead groups: City of Duluth, MDNR-fisheries, NRRI, MN Sea Grant); Note – there is potential for significant funding from MDNR in association with Dam Safety needs. Discussions between MDNR, City of Duluth and NRRI have occurred for the past 2 years and two proposals were previously submitted but not funded.

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#### V. Restoring Stream Trout in Buckingham Creek

**Project objective-** This is a three phase project which would develop a comprehensive solution to the source water issues affecting Buckingham creek and Upper Twin Pond in Duluth. This project will rehabilitate one of the few remaining trout ponds in Duluth, and revitalize a deadened section of trout stream by restoring base flow, natural shade cover, and correcting improper land uses.

**Cost estimate: \$ 500,000 for all phases** (Lead groups: City of Duluth, MDNR-fisheries, Enger Park Golf Course, and the Superior Regional Stormwater Protection Team). Note that this project could have potential for State Clean Water Legacy Act funding after the design phases are completed.

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#### VI. Stream-Line news

**Project objective-** This newsletter was created to connect watershed residents to the condition of the Lester River and Amity Creek and to efforts underway to restore the streams. The color newsletter has been published twice a year since 2007 (6 issues to date) by NRRI with help from many Consortium partners. Stories feature projects and ways for the general public to help reduce degradation of the streams. Although WSRI activities and projects in the Lester-Amity watershed has been the focus, stories involve the many related efforts occurring in other Lake Superior watersheds. It is mailed to over 2,000 watershed residents and consortium partners, and is downloadable from the website at [www.duluthstreams.org/weber/StreamLine.html](http://www.duluthstreams.org/weber/StreamLine.html) .

**Cost estimate: \$4,000/issue (\$8,000/yr)**



# STREAM-LINE

News for residents of the Lester-Amity rivers watershed

**WEBER STORMWATER INITIATIVE**  
 2005-2006  
 2007-2008  
 2009-2010  
 2011-2012  
 2013-2014  
 2015-2016  
 2017-2018  
 2019-2020  
 2021-2022  
 2023-2024

**STREAM-LINE**  
 Autumn/Winter 2009

**In this issue:**

- **Shoring up the Amity**
- **When it rains, it pours (into Amity Creek)**
- **Muddy waters cleared at Historic Green Road walk-out site**
- **See Weber - W Conservationist Award**
- **Great Lakes to get federal funding for protection and restoration**

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**STREAM-LINE**  
 Autumn 2007

**Beauty and the termac**

**Are we 'stressing out' the Lester-Amity?**

**Charrelle? You bet!**

**Spot a problem?**

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### Autumn 2007

#### In this issue:

- **Beauty and the termac**  
From run-off to rain garden
- **Are we 'stressing out' the Lester-Amity?**
- **Charrelle? You bet!**  
A development design for everyone
- **Spot a problem?**  
Let us know!

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**STREAM-LINE**  
 Autumn 2008

**Correcting Duluth's Overflows**

**Forests role in keeping water clean**

**Plant a tree**

**What you don't know about your watershed streams**

**Why is Amity Creek so muddy?**

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### Autumn 2008

#### In this issue:

- **Correcting Duluth's Overflows**
- **Forests role in keeping water clean**
- **Plant a tree**
- **What you don't know about your watershed streams**
- **Why is Amity Creek so muddy?**

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**STREAM-LINE**  
 Spring 2007

**Fish tales from the past**

**Get to know the Lester-Amity Watershed**

**Be a North Shore Ambassador**

**Go with the flow!**

**Working together:**

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### Spring 2007

#### In this issue of the StreamLine:

- **Fish tales from the past**  
Lester River hatchery was "first class" operation
- **Get to know the Lester-Amity Watershed**
- **Be a North Shore Ambassador**
- **Go with the flow!**  
Follow a raindrop down Amity Creek
- **Working together:**  
The Regional Stormwater Protection Team

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Table 1. Stream Consortium partners and co-investigators providing support and match-dollars for Weber Initiative projects.

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City of Duluth Parks and Recreation  
 City of Duluth Utilities Operations  
 Cook County Soil and Water Conservation District  
 Lake County Soil and Water Conservation District  
 Minnesota Pollution Control Agency  
 MN Department of Natural Resources Ecosystems Services Division  
 MN Department of Natural Resources Fisheries Division  
 MN Department of Natural Resources Lake Superior Coastal Program  
 MN Department of Transportation  
 Regional Storm Water Protection Team  
 South St. Louis Soil and Water Conservation District  
 University of Minnesota Bioproducts and Biosystems Engineering  
 University of Minnesota Duluth Geology Department  
 University of Minnesota Sea Grant  
 US Department of Agriculture Natural Resources Conservation Service

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Table 2. Successful Weber Initiative awards and funding sources received by NRRI utilizing both endowment and agency in-kind support to meet match requirements. This does not include agency-only expenditures.

<i>Proposal Name</i>	<i>Date</i>	<i>Match</i>	<i>Funded</i>	<i>Funding Source</i>	<i>Principal Investigator</i>
Stream Vulnerability	May 2005	\$122,684	\$35,000	USEPA/GLNPO	Johnson
Real-time Data on Steam Loading	December 2005	\$82,000	\$72,978	MN DNR Coastal Program	Axler & Host
Community Futures	December 2005	\$58,048	\$58,048	MN DNR Coastal Program	Brady
Stream Scale	April 2006	\$0	\$71,000	MN Sea Grant	Johnson
MPCA 319 BMP Monitoring	September 2006	\$148,000	\$103,000	EPA	Axler
Paired Neighborhood	September 2006	\$167,000	\$167,000	EPA	Lonsdale & Brady
Surface Water Assessment- North Shore Streams	November 2007	\$0	\$221,372	EPA	Axler
Ditching Work Group	September 2008	\$5,530	\$5,000	MN DNR Coastal Program	Brady
Surface Water Assessment- St. Louis River Wshed	November 2008	\$0	\$302,000	EPA	Axler
North Shore Sediment Indicators	September 2009	\$48,133	\$47,997	MN DNR Coastal Program	Brady
GLRI-Amity Creek Restoration	January 2010	\$0	\$843,000	EPA	Axler
<b>Total</b>		<b>\$631,395</b>	<b>\$1,926,395</b>		

# Company helps Amity Creek by planting trees

Efforts to keep Amity Creek a viable trout stream got a helping hand from employees of Loll Designs/Epicurean Cutting Surfaces in May.

Coordinating with the University of Minnesota Duluth's Natural Resources Research Institute (NRRI) and the South St. Louis Soil and Water Conservation District (SWCD), company owners purchased about 3,000 trees and rounded up about 20 employees to plant them.

While some trees went into Chester Park, others were planted to shore up a troublesome area by Amity Creek where NRRI, the SWCD and the city of Duluth recently stabilized the stream bank to reduce sediment erosion.

Excessive sediment has put the stream on the Environmental Protection Agency's "impaired" list.

The newly planted trees are very appreciated by the restoration collaborators.

"As these trees grow they'll improve the stability of the bank and minimize erosion, as well as provide shade to keep the water cool for trout," said Tim Byrns, conservation specialist at SWCD. "Planting native trees on an area cleared for pasture also restores the native forests that once dominated the area."

For company leaders Greg Benson, Dave Benson and Tony Ciradelli, the tree-



Epicurean chief executive officer Greg Benson joined company employees to plant about 3,000 trees on May 12 in an annual effort to help keep Duluth streams healthy.

planting effort is something they do for the long term benefit of the community.

"It's fun to do, and it's something different that we don't do at work," Greg Benson said. "And of course there are all the environmental reasons for planting

trees. We've been extremely busy, but I don't think we'll ever be too busy to take time each year to do this."

*Submitted by June Kallestad, Natural Resources Research Institute public relations manager.*