



# 319/Clean Water Partnership (CWP)/ Total Maximum Daily Loads Semi-Annual Report for Reporting Year 2011

Doc Type: Semi-Annual Report

Reporting Period:  January 1 through June 30 (Due August 1)  
 July 1 through December 31 (Due February 1)

All information is required by U.S. Environmental Protection Agency (EPA). Do not leave blanks. This report form can be typed using your computer. Use the "tab" key to move through the fields of this form. Enter responses using text and check boxes as indicated. Keep a copy for your records.

## I. General Report Information

1. Project title: Heron Lake Sediment Reduction Demonstration Project
2. Project sponsor: Heron Lake Watershed District
3. Project representative: Jan Voit, District Administrator
4. E-mail address: hlwd@roundlk.net
5. Funding:  319  CWP  Clean Water Legacy/Clean Water Fund  Other: \_\_\_\_\_
6. Contract number: CFMS:B41093 PRJ number: 7129
7. MPCA Project Manager: Katherine Pekarek-Scott
8. Contract start date (mm/dd/yyyy): 3/19/2010 Contract end date (mm/dd/yyyy): 8/29/2014

The following six questions refer to the lists on the Minnesota Pollution Control Agency (MPCA) website following this report form:

9. Best Management Practices (BMPs): Cut Bank Stabilization, Stream Channel Stabilization

10. Primary and Secondary Categories of Pollution:

	Primary	Secondary	Others
Category (name only)	hydromodification	channel erosion, incision	n/a

11. Nonpoint Source (NPS) Functional Category:

	Primary	Secondary	Others
Category (name only)	BMP Design/Implementation	sediment control	streambank stabilization

12. Waterbody type: Streams - ST

13. Type of pollutant(s) (use name, not code #s): sedimentation, siltation

14. Ecoregion: Western Corn Belt Plains

15. Hydrologic unit code (12 digits): 071000010704 Latitude-longitude: 43N 95W

16. Basin name (check all that apply): Statewide

- Lake Superior
- Lower Mississippi/Cedar
- Upper Mississippi
- Minnesota
- Rainy
- Red River
- Des Moines
- Missouri
- St. Croix

## II. Project Description

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**1. Project Description Summary (taken from work plan summary) – Include at least two paragraphs that briefly summarize the project scope, the processes and the events that occurred before this reporting period.**

Water samples are collected about 25 times each year at Jack Creek, Okabena Creek, and the Heron Lake outlet to determine water quality improvement. Data analysis for 2007 shows average concentrations at each site remained the same or slightly increased. In looking at the loads (the amount of pollutant that passed the sampling site), phosphorus, nitrogen, and sediment decreased at all three sites, indicating improved water quality. While improvements are being made in water quality, more needs to be done. The HLWD is looking for alternative methods to assist in that effort.

Flooding is a major problem along both creeks and cropland and township roads are being threatened by streambank erosion. Engineering studies have revealed several locations in which to install practices that could provide flood control benefits and sediment reduction for maximum benefit to the water quality of the Heron Lake Watershed District (HLWD). Acceptance by landowners is crucial to the implementation of these BMPs.

Project sponsors are proposing the demonstration of two sediment reduction techniques that are new to southwestern Minnesota, tree revetments and J-hook weirs. Both of these practices have documented success in other parts of the country. Limited information is available regarding use of these techniques in southwestern Minnesota. A common streambank erosion control method is riprap, which is expensive and does not truly solve the problem. Tree revetments and J-hook weirs are natural, effective, relatively inexpensive, and easily implemented. Benefits include streambank erosion control, restoration, and stabilization, sediment and phosphorus reduction, habitat gain, and improved water quality.

Successful implementation of these demonstration practices could lead to cost-share or incentive programs from the HLWD.

C. The known, suspected, or potential problems: In 1992, a diagnostic study reported that in-lake loading of nutrients is a problem in the Heron Lake watershed. The report stated there are four major problems in this watershed:

- Drainage and the speed of water as it moves through the watershed. Flooding causes erosion, dramatically impacting water quality.
- Urban sources of pollution from point sources and storm water runoff are a major problem in this system, particularly in the Okabena subwatershed.
- Tillage practices and lack of vegetative cover, riparian and field buffer strips, and windbreaks is another concern for the watershed.
- Compliance with feedlots (MN Rules 7020), ordinances and nutrient management (including manure spreading) and septic waste (MN Rules 7080).

The Heron Lake watershed drains to the West Fork Des Moines River (WFDNR) in Cottonwood County. Results of a 2001 WFDNR CWP diagnostic study show that about 58,000 tons of total suspended solids, 10 million pounds of nitrogen, and 485,000 pounds of phosphorus passed through Jackson, Minnesota.

In addition, aquatic life and aquatic recreation beneficial uses are impaired throughout the watershed. According to MPCA's 2008 Draft Impaired Waters List, there are five lakes, three fecal coliform bacteria impaired reaches, six turbidity impaired reaches, and one pH impaired reach. The WFDNR and Heron Lake TMDL Report was approved by the Environmental Protection Agency (EPA) in December of 2008 and addressed 15 turbidity, 15 fecal coliform, 1 excess nutrient, 1 pH impairment(s). The report concluded that streambank erosion contributes 12 percent of the phosphorus loading to the WFDNR watershed in a dry year and 33 percent during a wet year. The report stated to meet the water quality standards, a 10 percent to 86 percent reduction in bacteria, a 20 percent to 90 percent reduction in turbidity, and a 79 percent reduction in phosphorus is needed. An implementation plan was approved by the MPCA in September of 2009. The implementation plan calls for installing BMPs such as filter strips, alternative tile intakes, and wetland restorations and educational initiatives to reduce turbidity, bacteria, and phosphorus loading.

**2. Specific Project Goals – Include numeric, quantifiable goals for environmental improvement, the number of Best Management Practices to be installed, pollutant reductions as well as programmatic and social goals.**

Overall Goal: Increase landowner awareness of two unique streambank stabilization structures, cedar revetments and J-hook weirs, through two demonstration sites and promote structures through printed media, tours, meetings, and a website.

Project Goal 1: Install and demonstrate a cedar revetment and a J-hook weir at two locations in the Heron Lake watershed.

Project Goal 2: Provide educational opportunities through two tours and inform the public about the project through four newspaper articles and newsletters and four meeting updates to each of the four counties.

Project Goal 3: Provide digital documentation for use on the website and in presentations that illustrates structure capability and success through video footage and photographs before, during, and after installation.

### 3. Methods to achieve Goals:

#### Objective 1: Administration

##### Task A: Complete reporting requirements

- Draft and submit a work plan and semi-annual, annual, and final reports as required in the grant agreement. Semi-annual reports will be due August 1, annual reports will be due February 1, and the final report will be due 30 days from the last day of the contract. All costs associated with this task would be in-kind contributions.

#### Objective 2: Demonstration Sites

##### Task A: Install one cedar revetment

- Determine cedar revetment location through word of mouth advertising and monthly newsletters. Work with area contractor, landowner, and DNR to install one cedar revetment. A tree revetment is a bioengineering method that uses whole trees cabled tightly together in giant bundles. These bundles are then secured to the eroded streambank in a shingling effect, just like the shingles on a roof, through an anchoring system of cables. Tree revetments have been shown to greatly slow the stream current along an eroding bank, decreasing erosion and allowing sediment to be deposited in the tree branches of the revetment. The deposited sediment forms an excellent seedbed in which the seeds of riparian trees such as willows and cottonwoods, as well as other plants, can sprout and grow. The resulting growth spreads roots throughout the revetment and into the existing streambank. In addition to slowing streambank erosion, tree revetments also provide excellent habitat for birds, fish, and other forms of wildlife. All costs associated with this task would be in-kind contributions.

##### Task B: Install J-hook weirs

- Determine J-hook weir location through word of mouth, advertising, and monthly newsletters. Work with Southwest Prairie Joint Powers Organization (SWPJPO), contractor, landowner, and DNR to design and install one J-hook weir. The J-hook weir is an upstream directed, gently sloping structure composed of natural materials and is designed to reduce streambank erosion. The structure can include a combination of boulders, logs, and root wads, and is located on the outside of stream beds where erosion is occurring in the near-bank region. Recirculation of the water flow from the near-bank does not cause erosion. The vane portion of the structure occupies one-third of the width of the channel, while the "hook" occupies the center third. Water velocity is decreased in the near-bank region and increased in the center of the channel. Sediment transport can be maintained in the center third of the channel. Backwater is created only in the near-bank region. The small vane angle gently redirects water velocity from the near-bank region, reducing active bank erosion. The "hook" portion of the vane produces a long, deep, wide pool, providing energy dissipation and holding cover for fish.

#### Objective 3: Education and Outreach

##### Task A: Monitor sites and collect documentation

- Collect video footage of the cedar revetment and J-hook weir sites before, during, and after installation. The purchase of a video camera and tripod would be an in-kind contribution.
- Record each site on video and with photographs on an annual basis during high flow, medium flow, and low flow.
- Take transparency tube readings when on site to document water quality changes.

##### Task B: Publicize through newsletters

- On an annual basis, highlight the project in the HLWD's monthly newsletter. Once the locations are chosen and projects are installed, a newsletter would be written that highlights the demonstration project and locations. Two newsletters would contain bus tour information. At the conclusion of the project, a newsletter would be written discussing the success of the demonstration projects. The HLWD's monthly newsletter is distributed to over 3,400 addresses. All costs associated with this task would be in-kind contributions.

##### Task C: Publicize through newspapers

- Submit four news articles to local newspapers. A news article highlighting the demonstration project, locations, and bus tour information would be written at the beginning and conclusion of the project. In addition, two articles during project implementation would be written. These articles would be submitted to the Tri County News, Fulda Free Press, Lakefield Standard, Cottonwood County Citizen, and Worthington Daily Globe for publication. All costs associated with this task would be in-kind contributions.

##### Task D: Plan and host two bus tours

- Plan and host two bus tours. Once the locations are chosen and projects are installed, plans would be completed for hosting a bus tour. A date would be chosen, bus rental secured, speakers selected, refreshments ordered, and advertising completed through the HLWD's newsletter and news releases to area newspapers and radio stations. A similar process would be used for the bus tour at the conclusion of the project. All costs associated with this task would be in-kind contributions.

##### Task E: Display information on website

- Edit video footage and update website. Project progress would be documented through photographs and video footage. Photos and video footage would be posted on the website as a means to show project progress.

Task F: Present information at meetings

- Annually, the HLWD Administrator will attend the Nobles, Cottonwood, Jackson, and Murray counties commissioner meetings to provide updates. In addition, HLWD will provide updates to the HLWD Board of Managers as needed. All costs associated with this task would be in-kind contributions.

### III. Semi-annual Report Information

#### 1. Project activities completed during last six (6) months according to the program elements or tasks:

Objective 1 - Task A: The annual report was submitted on December 30, 2011.

Objective 3 – Task A: Cedar trees had separated from the bank. On September 27, 2011, Ross Behrends and Margaret Peeters spent time re-attaching the trees to the bank.

Objective 3 - Task A: Margaret Peeters was responsible for monitoring and documentation of the cedar revetment site. Information was gathered as follows:

- 4/4/2011: video footage and photos
- 5/5/2011: video footage and photos
- 5/17/11: video footage and photos, and transparency tube reading
- 7/21/2011: video footage and photos
- 8/1/2011: video footage and photos
- 8/3/2011: video footage, photos, and transparency tube reading
- 9/19/2011: video footage, photos, and transparency tube reading

Objective 3 - Task A: Margaret Peeters was responsible for monitoring and documentation of the J-hook weir site. Information was gathered as follows:

- 4/4/2011: video footage and photos
- 5/5/2011: video footage and photos
- 5/17/11: video footage photos, and transparency tube reading
- 7/21/2011: video footage and photos
- 8/1/2011: video footage and photos
- 8/3/2011: video footage, photos, and transparency tube reading
- 9/19/2011: video footage, photos, and transparency tube reading

Objective 3 - Task E: Margaret Peeters posted summary information about the Heron Lake Sediment Reduction Demonstration grant on the HLWD website on July 6, July 21, and August 5, 2011.

#### 2. Challenges faced (optional):

Heavy spring rains made it difficult to gather data at the sites.

#### 3. Summary of monitoring data collected:

Cedar Revetments	Date	Turbidity Tube Measurement (cm)
	5/17/2011	41.00
	8/3/2011	8.00
	9/19/2011	15.00

J-Hooks	Date	Turbidity Tube Measurement (cm)
	5/17/2011	40.00
	8/3/2011	9.00
	9/19/2011	18.5

4. Have all monitoring stations been established in STORET?  Yes  No  N/A
5. Is the data being routinely submitted for storage into STORET?  Yes  No Last submittal date: \_\_\_\_\_
6. Is the data being annually entered into E-Link?  Yes  No  N/A Date last entered: \_\_\_\_\_
7. Identify any significant *findings* and *results* of the project to date, as well as any unanticipated findings:  
None
8. Describe specific (quantifiable, if possible) results achieved during this period:

n/a

Phosphorus Load Reduction:	<u>          n/a          </u>	lbs./year
Nitrogen Load Reduction:	<u>          n/a          </u>	lbs./year
Sediment Load Reduction:	<u>          n/a          </u>	lbs./year

**9. Summarize any work plan changes:**

None

**10. List anticipated activities for next six (6) months:**

Objective 1. Task A: Complete and submit annual report  
Objective 1. Task A: Begin drafting semi-annual report

Objective 3. Task A: Take photos, video footage, and transparency tube readings at the J-hook weir site  
Objective 3. Task A: Take photos, video footage, and transparency tube readings at the cedar revetment site  
Objective 3. Task C: Newspaper article regarding project progress  
Objective 3. Task E: Maintain web page devoted to this project that contains photo and video documentation, project progress, and bus tour information  
Objective 3. Task F: Update on project progress at HLWD June meeting  
Objective 3. Task F: Update at Jackson County Water Plan meeting in January 2012

**11. List all products (documents, pamphlets, videos, maps, etc.) produced in this reporting period.**

a) Photos, video footage, and transparency tube readings as described above

**IV. Expenditure Information for this Period**

Provide a copy of your work plan budget showing cumulative expenditures and budget balances by work plan objective and task.

Expenditure Report attached

<b>Complete the table below:</b>	<b>Amount</b>
Total Grant Amount:	\$16,500.00
Total Match Amount (if applicable)	\$13,556.00
<b>Total Project Amount:</b>	<b>\$30,056.00</b>
Cumulative Grant Expenditures through this period:	\$13,443.85
Cumulative Match Expenditures through this period:	\$11,265.39
<b>Total Cumulative Expenditures through this period:</b>	<b>\$24,709.24</b>

Date form completed: December 30, 2011

**Please submit to:** Your project manager