

**Project Abstract:** M.L. 2011  
For the Period Ending June 30, 2014

**PROJECT TITLE:** Zumbro River Watershed Restoration Prioritization  
**PROJECT MANAGER:** Lawrence Svien  
**AFFILIATION:** Zumbro Watershed Partnership  
**MAILING ADDRESS:** 1485 Industrial Drive NW  
**CITY/STATE/ZIP:** Rochester, MN 55041  
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**E-MAIL:** director@zumbrowatershed.org  
**WEBSITE:** <http://www.zumbrowatershed.org/>  
**FUNDING SOURCE:** Environment and Natural Resources Trust Fund  
**LEGAL CITATION:** M.L. 2011, First Special Session, Chp. 2, Art.3, Sec. 2, Subd. 05d

**APPROPRIATION AMOUNT:** \$150,000.00

### **Overall Project Outcome and Results**

This project identified and prioritized areas in the Zumbro River Watershed that were determined critical for restoring and protecting water quality. Studies suggested that small areas of the landscape contribute disproportionately to nonpoint source pollution. So implementation of conservation projects that focus on those areas will maximize water quality benefits and ensure efficient use of resources

Using tools like Light Detection and Ranging (LiDAR) data and other Geographic Information System (GIS) data sets, candidate sites were identified and ranked as critical areas of soil erosion and surface runoff in the watershed. In addition, in-field assessment techniques were developed and documented to further evaluate these source locations.

By the conclusion of the project a number of different methods to determine priorities of those critical areas were identified by local partners. They felt that using only one method to rank and sort the sites was not a good use of the dataset. The partners wanted to be able to sort and parse the results in a number of different ways according to both resource issues and impairments present. It was not always going to be similar for each sub-watershed. In the end the final selection of sites then became approximately 205 sites with resource attribution. This would allow a number of different ways of sorting and prioritizing.

By combining the identified sites and in-field assessment techniques a set of protocols were established to determine the most appropriate BMPs needed to restore the sites to sustainable levels.

A training session was provided to SWCD and County Staff's. A Digital Terrain Analysis Manual was published and is currently posted on the Zumbro Watershed Partnership website. This will be a guide to local partners in the watershed that along with the provided data sets, allows them to create their own priority sites data.

### **Project Results Use and Dissemination**

The datasets were used to identify priority sub watersheds within the Zumbro. These sub watersheds were prioritized in the recently revised Zumbro Watershed Comprehensive Plan. In addition, the MN Board of Water and Soil Resources issued a request for information for the Targeted Watershed Demonstration Grant. This project was instrumental in identifying and

defining the priority sub-watersheds that contained the most critical sites. In addition the in-field assessment and the BMP matrix allowed us to identify the most appropriate BMPs necessary to treat the sites. With BMPs identified, typical cost helped estimate project cost and the amount and type of public assistance needed at \$1.6 M. The type and quality of the data from this project application also helped secure additional commitments from USDA NRCS for \$750,000 in EQIP funding.

The data continues to be used by county water planners in the development and revisions of County Water Plans. The GIS data sets are currently posted on an ftp site maintained by Barr Engineering. All county water planners and SWCD staff have access to the site. Because of the sensitive nature of the data access is limited to those staff persons at this time.

Project information was disseminated to project partners on an ongoing basis (usually quarterly to semi-annually) through meetings and presentations arranged by Zumbro Watershed Partnership in Rochester. In addition, individual meetings were held with the SWCD and NRCS staff in the Olmsted, Dodge, Wabasha and Goodhue County offices to convey our findings and solicit feedback on the development of guidance for assessing BMP suitability for various sites, based on agroecoregion location and site characteristics. A similar meeting was held with Rochester staff to discuss BMP priorities for urban and suburban applications. The digital terrain analysis manual content was disseminated to the project partners through a training session in Rochester.

The Zumbro Watershed Partnership project partners were trained in the protocols provided in the digital terrain analysis manual so they can apply this process in the future for identifying critical source areas at alternatives scales, and/or as new information becomes available they can monitor changing conditions to update the list of priority projects as necessary. Work relating to the project has been published in two manuals and the critical source areas identified throughout the watershed during the project have been stored in a GIS database, along with the background data used in the decision-making, for shared use by the project partners.



## Environment and Natural Resources Trust Fund (ENRTF) M.L. 2011 Work Plan

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**Date of Status Update:** 1/30/2014

**Date of Next Status Update:** 6/30/2014

**Date of Work Plan Approval:** 6/23/2011

**Project Completion Date:** 6/30/2014

**Is this an amendment request?** No

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**Project Title:** Zumbro River Watershed Restoration Prioritization

**Project Manager:** Lawrence Svien

**Affiliation:** Zumbro Watershed Partnership

**Address:** 1485 Industrial Dr NW, Rm 102

**City:** Rochester **State:** MN **Zipcode:** 55901

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**Web Address:** <http://www.zumbrowatershed.org>

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**Location:**

**Counties Impacted:** Dodge, Goodhue, Olmsted, Rice, Steele, Wabasha

**Ecological Section Impacted:** Minnesota and Northeast Iowa Morainal (222M),  
Paleozoic Plateau (222L)

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<b>Total ENRTF Project Budget:</b>	<b>ENRTF Appropriation \$:</b>	150,000
	<b>Amount Spent \$:</b>	137,294
	<b>Balance \$:</b>	12,706

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**Legal Citation:** M.L. 2011, First Special Session, Chp. 2, Art.3, Sec. 2, Subd. 05d

**Appropriation Language:**

\$75,000 the first year and \$75,000 the second year are from the trust fund to the commissioner of natural resources for an agreement with the Zumbro Watershed Partnership, Inc. to identify sources of erosion and runoff in the Zumbro River Watershed in order to prioritize restoration and protection projects.

## **I. PROJECT TITLE:** Zumbro River Watershed Restoration Prioritization

**II. PROJECT SUMMARY:** This project will identify and prioritize areas in the Zumbro River Watershed that are critical for restoring and protecting water quality. Currently, conservation practices in the Zumbro Watershed are implemented opportunistically because a coordinated, watershed-wide approach for identifying critical sources of nonpoint source pollution, prioritizing sites and planning implementation projects is absent. Studies suggest that small areas of the landscape contribute disproportionately to nonpoint source pollution, so implementation of conservation projects should focus on those critical areas to maximize water quality benefits and ensure the most efficient use of resources. To arrive at our goal, we will 1) analyze Light Detection and Ranging (LiDAR) data and other Geographic Information System (GIS) data to identify and rank critical areas of soil erosion and surface runoff for the 910,337-acre watershed and 2) develop and use an in-field assessment technique to further evaluate the top 50 source locations in the Zumbro Watershed. Outcomes of this project include determination of the top 50 critical sites, and identification of appropriate conservation practices and potential funding sources for those projects. In addition, Zumbro Watershed Partnership partners will be trained in the protocols developed so they can apply this process to the remainder of critical areas identified through the project and monitor changing conditions to update the list of priority projects as necessary. The Minnesota Department of Agriculture is a collaborating agency on this project and will help disseminate results to other Minnesota watersheds that may want to conduct similar projects.

## **III. PROJECT STATUS UPDATES:**

**Project Status as of January 31, 2012:** Due to the delay caused by the government shutdown in July 2011 and a consequential delay in receiving our pass-through contract from the DNR, a signed contract for this project was not executed until October 20, 2011.

Another problem encountered was a delay in the availability of LiDAR data for Goodhue County. This data was anticipated in spring 2011; however, due to high water conditions in the fall 2010 and spring 2011, this data was not acquired until November, 2011. According to the Minnesota Elevation Mapping Project, LiDAR data will be available for Goodhue County in June 2012.

Because of these delays, we have adjusted the Activity completion dates and Project/Activity Status dates in this Work Plan. With these delays, we intend for our project to be completed by no later than December 31, 2013. Additionally, we did not change the amount allocated to the Budget Personnel line but modified it from a .1 FTE 100% salary for 2 years to a .1 FTE 90% salary and 10% benefits for 2.25 years.

### **Project Status as of June 30, 2012:**

The project kick off meeting was held at Cascade Meadows Wetland Environmental Education Center on June 4, 2012. In attendance were representatives of Barr Engineering and the University of Minnesota. It was reviewed the proposed work plan and needed data sources. 26 partners, stakeholders, and other were present and gave feedback on planned activities.

ZWP Executive Director met with Greg Wilson, Barr Engineering and Dave Mulla, University of Minnesota and timelines were discussed. It has been identified that a modification to the agreement between ZWP and Barr will need to be completed to reflect the change in project end date as described in the modification. Because of the late start as described above a revised timeline is being developed with the new project end date identified.

**Work Program Amendment Request:** I (Lawrence Svien) replaced Lisa Eadens, Coordinator and at the time of my hire the title was Executive Director. The position is part time at 20 to 25 hours a week. This funding enabled 0.1 FTE of that work to work directly on this project in a project specific capacity. So in that respect when I work on this project I am functioning as the coordinator for this project. At the

end of the project my position will either be reduced to reflect the end of the 0.1 FTE/year support or other funding will be secured.

### **Amendment Approved [September 7, 2012]**

#### **Project Status as of January 31, 2013:**

Contract items continue to move forward. Fall field verification of data was completed by vendor. ZWP secured access to landowner property in identified sub watersheds. A meeting was held in September with watershed partners to review and identify available data sources, and nominate possible priority watersheds for the model.

#### **Project Status as of February 14, 2013:**

#### **Work Program Amendment Request**

A recent meeting was held with Barr Engineering and Dr. Mulla with the Uof M to review project progress. Dr. Mulla discussed there has been problems with his grad students getting landowner access to properties for field verification of his model. We discussed some alternatives and believe we can get him and his staff access to equivalent sites. This has put the project somewhat behind schedule. The original plan was to have the field work for field validation completed in the fall of 2012 and this will force us to move into spring of 2013 for that phase. While some time can be made up with overlapping of some activities the scheduling of Activity 2, Outcome 2 Pilot the in-field assessment for the top 50 sites in the Zumbro was a mistake. That outcome cannot be performed in July because the only thing a field person will see is 7 foot high corn. In order to complete that portion of the project we will have to wait until the fall harvest is completed. Estimated to be October 2013.

### **Amendment Approved:[02/28/2013]**

#### **Project Status as of June 30, 2013:**

A number of meetings between Barr Engineering and ZWP staff have occurred to review project status and review of project timelines and milestones. ZWP staff worked with SWCD staff to acquire land access for Barr Engineering staff and University of Minnesota staff for the field verification phase of the Activity 1. This also provided an opportunity to do a field trial of the in-field assessment worksheet being developed for Activity 2. A progress update presentation was made at the spring ZWP Project Advisory Committee (PAC) meeting.

#### **Project Status as of January 31, 2014:**

Preliminary maps and GIS data files have been produced by Barr Engineering and the University of Minnesota. These data files and locations have already been used as the basis for a 2.5 M grant request for a Board of Water and Soil Resources Targeted Watershed Demonstration Project. The data from this project provided targeting information. Activity 1 is 95% complete. Field protocols are in draft form and being reviewed by partner agencies. Training and sites will be discussed at next ZWP PAC meeting on Jan 16<sup>th</sup>.

#### **Project Status as of June 30, 2014:**

Mapping has been completed and posted to vendor ftp site. Manuals have been published and distributed to local partners. Training activities have been completed. Final meeting with project partners was held June 18,2014 for final solicitation and comments on field protocols and BMP selection matrix.

### **Overall Project Outcome and Results**

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published in two manuals and the critical source areas identified throughout the watershed during the project have been stored in a GIS database, along with the background data used in the decision-making, for shared use by the project partners.

**IV. PROJECT ACTIVITIES AND OUTCOMES:**

**ACTIVITY 1: LiDAR/GIS Screening for Critical Areas**

**Description:** In 2010, the Minnesota Department of Agriculture (MDA) disseminated information on a methodology for analyzing LiDAR and ancillary GIS data to efficiently identify and rank critical areas of soil erosion and surface runoff that are potentially hydrologically connected to a surface water body. LiDAR has greatly improved the resolution of elevation data, adding significant efficacy and analytical capabilities to defining critical runoff areas. This project will be among the first to implement MDA’s approach for an entire major watershed.

Before beginning, we will communicate with Dr. Mulla (U of M) to discuss the progress of his current project, “Strategic Planning for Minnesota’s Natural and Artificial Watersheds,” which received funding from the ENRTF in 2010. In particular, we will determine if the new computer topographic analysis software can be applied to our project to more efficiently analyze the large LiDAR datasets for the Zumbro Watershed. Additionally, we will see what data collection and analysis have been completed for the Zumbro Watershed as a result of Dr. Mulla’s project and how they may be used to guide or strengthen our project.

Based on the results from Dr. Mulla’s project, existing LiDAR data and data acquired in 2011 from the Minnesota Elevation Mapping Project will be analyzed to determine critical areas of erosion and surface runoff in the 910,337-acre Zumbro Watershed. Critical areas identified by the LiDAR analysis will be validated using both a comprehensive field assessment of two diverse ~20,000-acre sub-watersheds (glaciated and non-glaciated) and a survey of randomly selected points throughout the remainder of the watershed. Based on the field verification, the threshold value used in the analysis will be modified. The deliverables for this step of the project will be 1) the determination of an appropriate threshold value or multiple threshold values for the Zumbro Watershed and 2) a ranked list of critical areas in the Zumbro Watershed.

**Summary Budget Information for Activity 1:**

**ENRTF Budget: \$ 66,200**  
**Amount Spent: \$ 65,587**  
**Balance: \$ 613**

**Activity Completion Date:**

<b>Outcome</b>	<b>Completion Date</b>	<b>Budget</b>
1. Conduct initial LiDAR analysis	July 2012	\$ 23,500
2. Field verify analysis	<u>April 2013</u>	\$ 34,600
3. Obtain preliminary prioritized list of critical sources of runoff for the Zumbro	<u>May 2013</u>	\$ 8,100

**Activity Status as of January 31, 2012:** A Request for Proposals (RFP) was issued on December 6, 2011 with a submission deadline of January 17, 2012. The RFP included all of the work outlined in Activity 1. Proposals were received by: Houston Engineering, Barr Engineering, McGhie and Betts Inc., Inter-fluve, and Stantec. Proposals were screened for eligibility based on content and format instructions. All five proposals were routed to a Review Committee composed of eight members, including project partners and ZWP Board of Directors. A Review Committee meeting is scheduled for

February 2, 2012 to rank the technical proposals and review the associated cost proposals. Contract execution with the selected subcontractor is expected in early March, 2012.

Additionally, we had a conversation with Dr. Mulla (U of M) to discuss the progress of his current project, "Strategic Planning for Minnesota's Natural and Artificial Watersheds," which received funding from the ENRTF in 2010. According to Dr. Mulla, the new computer topographic analysis software that is part of this project is not yet available for use in our project.

Project expenses thus far have been incurred only for personnel in development of the RFP, communication with proposal principal investigators and review of the RFPs. Because the RFP includes both Activity 1 and parts of Activity 2, total personnel expenses were split equally between Activity 1 and Activity 2.

**Activity Status as of June 30, 2012:** Initial Kick off meeting has been held with Barr Engineering and the University of Minnesota. Twenty six watershed partners, stakeholders and others were in attendance and provided input to the sub-watershed selection process. Data sources are being identified and provided to Barr. An ftp site has been hosted by Barr to act as the collection point for data needed. The City of Rochester, Goodhue SWCD, and ZWP have already begun to upload data.

LiDAR terrain elevation data were obtained for all counties within the Zumbro watershed. Terrain analysis was conducted using primary and secondary terrain attributes from the LiDAR data. Primary terrain attributes include slope, aspect, and flow accumulation. Secondary terrain attributes include stream power index (SPI) and compound topographic index (CTI). CTI represents areas on the landscape that have flat slopes and high flow accumulation, and a higher likelihood of surface water ponding. SPI represents areas on the landscape that have high slopes and flow accumulation, and therefore higher likelihood of containing surface erosion features. Critical source areas (CSAs) can be identified in GIS using the SPI signatures after selecting threshold values that are associated with the CSAs. Several threshold values were evaluated for SPI layers (by keeping values above certain percentiles) in order to identify CSAs. The SPI threshold layer that is best suited for the area will be determined during the field visits.

Locations of CSAs were estimated for the following HUC 12 watersheds:

- HUC12 #4107500 (Town of Rock Dell, South Fork Zumbro River) in Olmsted Co.
- HUC12 #4104700 (Middle Creek, north of Plainview) in Wabasha Co.
- HUC12 #4108700 (Rice Lake, South Branch Middle Fork Zumbro River) in Dodge Co.
- HUC12 #4102700 (Headwaters North Fork Zumbro River) in Rice Co.

Data layers used to select areas for the initial terrain analysis included:

- Agro-eco-region boundaries
- DNR watershed boundaries
- DNR 24k stream and lake data
- DNR township level PLS boundaries
- DNR karst feature inventory points
- 2006 National Land Cover Data at a resolution of 30 m
- SSURGO tabular and spatial data
- Environmental Benefits Index data at a resolution of 30 m



- 2011 Spring Aerial Imagery Program data at a resolution of 0.5 m

There are several potential candidate regions for upcoming field work to validate the CSA predictions. Milford Township in Dodge Co. has several well defined SPI signatures. It contains four different agro-eco-regions and a concentration of springs and sinkholes in the NW section, though the EBI scores in this region are fairly low. Gillford Township in Wabasha Co. consists mainly of the Rochester Plateau agro-eco-region and has low EBI scores. Using aerial photos it appears that there are already significant management practices in place such as buffers and contour farming, so CSAs identified using terrain analysis might have already been treated. The East ½ section of the Rock Dell Township in Olmstead Co., along with the NW section of High Forest Township has karst features, diverse agro-eco-regions, and some of the highest EBI scores in the Zumbro Watershed, so it might be a good area to focus for upcoming field work.

**Activity Status as of January 31, 2013:**

Barr Engineering was selected by the Review Committee. A agreement was signed by ZWP and Barr Engineering April 17, 2012. Convened and attended a meeting with the best professional judgment group to discuss the work objectives and methodology for the project. The best professional judgment group is a subset of the Zumbro Watershed Partnership Project Advisory Committee. It is made up of multi-agency and jurisdictional professional conservationist and water quality experts in the SE MN and its purpose is to provide their professional expertise and experience before and during the project implementation.

Including presentation of the project work plan, identification of available GIS data, establishment of criteria for CSA identification and discussion of the 2010 flood and it's impacts on the 2008 LiDAR data.

Assembled all of the available GIS data layers for an initial GIS assessment to model or identify potential CSAs. Preliminary locations of CSAs were estimated using EBI data for four HUC 12 watersheds. Arrangements were made with the local SWCD office to visit one of the four HUC 12 watersheds located in Dodge County.

Our project team convened a meeting with the best professional judgment group on September 19, 2012 to discuss assembled GIS data layers and candidate subwatersheds for field-verification. GIS data layers assembled for review at the meeting and/or subsequently used to get feedback on selecting the candidate areas for field-verification include:

- Agroecoregion boundaries
- DNR watershed boundaries
- DNR 24k stream and lake data
- DNR township level PLS boundaries
- DNR karst feature inventory points
- 2006 National Land Cover Data at a resolution of 30 m
- SSURGO tabular and spatial data
- Environmental Benefits Index (EBI) data at a resolution of 30 m
- 2011 Spring Aerial Imagery Program data at a resolution of 0.5 m
- Feedlot coverage
- Crop Productivity Indices
- Impaired Waters coverage
- City of Rochester CSAP data
- Shady Lake LiDAR coverage from 2011
- ZWP's compilation of available data from Counties showing locations and types of existing agricultural BMPs and culverts
- Geologic Survey plates showing sinkhole probability in Goodhue and Olmsted counties and karst features in Wabasha county

An FTP site was set up and all project data was made available for download by the best professional judgment group. the available GIS data layers for an initial GIS assessment fo model or identify potential CSA's

Discussed assembled GIS data layers and candidate sub-watershed for field verification with the best professional judgment group on September 19, 2012

Provided contacts to landowners in watershed on identified sub-watershed field verification sites.

Contacted landowners and secured access to property for validation of model. Assembled all of the available GIS data layers for an initial GIS assessment to model or identify potential CSAs. Preliminary locations of CSAs were estimated using EBI data for four HUC 12 watersheds. Arrangements were made with the local SWCD office to visit one of the four HUC 12 watersheds located in Dodge County. Our project team convened a meeting with the best professional judgment group on September 19, 2012 to discuss assembled GIS data layers and candidate subwatersheds for field-verification. GIS data layers assembled for review at the meeting and/or subsequently used to get feedback on selecting the candidate areas for field-verification include:

- Agroecoregion boundaries
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- DNR karst feature inventory points
- 2006 National Land Cover Data at a resolution of 30 m
- SSURGO tabular and spatial data
- Environmental Benefits Index (EBI) data at a resolution of 30 m
- 2011 Spring Aerial Imagery Program data at a resolution of 0.5 m
- Feedlot coverage
- Crop Productivity Indices
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- City of Rochester CSAP data
- Shady Lake LiDAR coverage from 2011
- ZWP's compilation of available data from Counties showing locations and types of existing agricultural BMPs and culverts
- Geologic Survey plates showing sinkhole probability in Goodhue and Olmsted counties and karst features in Wabasha county

An FTP site was set up and all project data was made available for download by the best professional judgment group.

### **Activity Status as of June 30, 2013:**

The team completed pre-analysis GIS work and made arrangements with both the Wabasha and Goodhue SWCD offices to identify landowners and obtain permission to visit each of three HUC 12 sub-watersheds located in the Cold Creek/Bear Valley watershed. Barr Engineering and University of Minnesota staff coordinated site visits in May and June to inventory and map streambank and gully/ravine erosion sites in the Cold Creek watershed. They have since been processing and analyzing the data obtained from field work conducted in the Cold Creek watershed, which involves a random point comparison and percentile analysis of the sediment delivery potential (SDP) of erosional features identified (or not identified) in the field with the GIS techniques, to validate the approach. In addition, they continue to evaluate the relationships between the stream geomorphology data that we have collected from the Zumbro watershed and the same stream channel characteristics that can be derived from our GIS/LiDAR analysis to verify our approach for prioritizing critical sources of channel erosion. All of this work is continuing this quarter, along with application of our results to the greater Zumbro watershed, along with comparisons to the water monitoring data available in each sub-watershed.

### **Activity Status as of January 31, 2014:**

Completed pre-analysis GIS work and made arrangements with both the Wabasha and Goodhue SWCD offices to identify landowners and obtain permission to visit each of three HUC 12 subwatersheds located in the Cold Creek/Bear Valley watershed.

Coordinated site visits in May and June to inventory and map streambank and gully/ravine erosion sites in the Cold Creek watershed.

Processing and analyzing the data obtained from field work conducted in the Cold Creek watershed to validate approach for identifying erosional features.

Evaluating relationships between the stream geomorphology data and same stream channel characteristics that can be derived from our GIS/LiDAR analysis to verify our approach for prioritizing critical sources of channel erosion.

Processed and analyzed the data obtained from field work conducted in the Cold Creek Watershed to validate approach for identifying erosional feature

Evaluating relationships between the stream geomorphology data and same stream channel characteristics that can be derived from the GIS LiDAR analysis to verify the approach for prioritizing critical sources of channel erosion

Developing draft digital terrain analysis manual and circulated document for review and comment from project partners

PAC meeting at Cascade Meadows to provide a project update.

### **Final Report Summary:**

Light Detection and Ranging (LiDAR) data and other Geographic Information System (GIS) data were analyzed to identify and rank critical areas of soil erosion and surface runoff for the 910,337-acre Zumbro River watershed and in-field assessment techniques were used to further verify that the top source locations in the Zumbro Watershed. The in-field assessment techniques were developed and verified by data collected from four smaller subwatershed areas (glaciated and non-glaciated areas total approximately 40,000 acres) and a survey of randomly selected points throughout the remainder of the watershed, which were compiled and used to develop the field assessment manual. After

meeting with watershed practitioners and compiling GIS information about all of the existing Best Management Practices (BMPs) inventoried in the Zumbro watershed, we developed BMP recommendation guidance in the form of a suitability matrix, which was also published in the field assessment manual. We developed relationships between the stream geomorphology data and some stream channel characteristics that were derived from our GIS/LiDAR analysis to verify our approach for prioritizing critical sources of channel erosion. This information was combined with the terrain analysis techniques to develop step-by-step GIS guidance and case studies for identifying and prioritizing critical pollutant source areas in various types of settings (or agroecoregions) across the Zumbro River watershed, which was published in the digital terrain analysis manual.

**ACTIVITY 2: Prioritization and BMP Implementation Planning**

**Description:** This activity will utilize existing in-field assessment techniques to develop a standard procedure for gathering additional information on field conditions for sites identified using LiDAR analysis to assist in planning appropriate Best Management Practices (BMPs) for the sites. The Zumbro Watershed Partnership partners will create a watershed-wide prioritized list of project sites and determine appropriate and validated BMPs to address runoff at the top 50 sites. Multiple data sources will be used, including: the LiDAR analysis, the in-field assessments, an inventory of agricultural stabilization structures due in May 2012, data on state-funded conservation projects, and results from three current projects funded by the ENRTF – “Strategic Planning for Minnesota’s Natural and Artificial Watersheds,” “Statewide Ecological Ranking Conservation Reserve Program (CRP) and Other Critical Lands,” and “Understanding Sources of Aquatic Contaminants of Emerging Concern.” Once complete, landowners can be contacted about implementation projects and funding sought from appropriate jurisdictional authorities for those projects. This protocol will be piloted for the top 50 critical source areas identified in Activity 1. In addition, Zumbro Watershed Partnership partners will be trained in these protocols so they can apply this process to the remainder of critical areas identified through the project.

**Summary Budget Information for Activity 2:**

**ENRTF Budget: \$ 83,800**  
**Amount Spent: \$ 71,707**  
**Balance: \$ 12,093**

**Activity Completion Date:**

<b>Outcome</b>	<b>Completion Date</b>	<b>Budget</b>
1. Develop standard procedure for in-field assessment of critical runoff sites	June 2013	\$ 5,000
2. Pilot the in-field assessment for the top 50 runoff sites in the Zumbro	October 2013	\$ 58,300
3. Create a prioritized list of project sites and plan BMPs for each location	December 2013	\$ 7,000
4. Train Zumbro Watershed Partnership partners in LiDAR & field protocols	February 2014	\$ 13,500

**Activity Status as of January 31, 2012:** Outcomes 1-3 of Activity 2 were included in the RFP described above. After several conversations with Leslie Everett with the University of Minnesota about his ENRTF project “Strengthening Natural Resource Management with LiDAR Training,” it was decided that a separate RFP for Outcome 4 “Train Zumbro Watershed Partnership partners in LiDAR & field protocols” would be issued in 2013 after we evaluate the progress of Mr. Everett’s project.

As stated above, project expenses incurred during this phase of the project were split equally between Activity 1 and Activity 2.

**Activity Status as of June 30, 2012:**

Data as defined in the Activity Description have been acquired. The inventory or agricultural stabilization structures has been completed, compiled, and disseminated to Barr Engineering and the University of Minnesota. LiDAR data has also been acquired and cataloged. Goodhue County LiDAR data files are only good to the 3 meter scale at this time. Additional work is going to be performed on the data file and 1 meter resolution is expected to be available by the end of August.

**Activity Status as of January 31, 2013:**

No activity on this Activity during this reporting period.

**Activity Status as of June 30, 2013:**

Field assessment worksheets have been developed for use in the in-field assessment phase. The sheets were reviewed by ZWP staff in addition to Barr Engineering and University of Minnesota field staff. Minor edits and corrections have been made on these. It is expected that by Fall 2013 in-field assessments will be performed.

In addition potential training sites here in the watershed have been discussed with Barr Engineering.

**Activity Status as of January 31, 2014:**

Developing draft field assessment manual and circulated document for review and comment from project partners

**Final Report Summary:**

Developed digital terrain analysis manual based on review and comment from project partners

Developed field assessment manual based on review and comment from project partners

Developed watershed-wide coverage of approximately 200 upland critical source areas and approximately 600 high-risk areas for near-bank channel erosion (based on guidance provided in digital terrain analysis manual) and recommended practices for each site (based on guidance provided in the field assessment manual). The upland critical source areas were attributed with a number of different resource characteristics to aid in prioritization and selection.

Trained 15 project partners on the use of the digital terrain analysis tools.

**V. DISSEMINATION:**

**Description:** Results from this study will be shared on the Zumbro Watershed Partnership website, [www.zumbrowatershed.org](http://www.zumbrowatershed.org), at quarterly meetings of the Zumbro Watershed Partnership Project Advisory Committee, and at monthly meetings of the Zumbro Watershed Partnership Board of Directors as appropriate. We also anticipate sharing the information at one or more regional meetings of the Basin Alliance for the Lower Mississippi in Minnesota that meets bi-monthly and includes agency, local government, NGO's and non-profit staff from 13 counties in SE Minnesota.

The MDA will be instrumental in adding statewide value to the project and in disseminating results. The same MDA staff who are partners on this project also serve on state-level Clean Water Fund interagency teams charged with coordinating restoration/protection strategies, implementing funding, and research. Therefore, they will use the lessons learned through this project to provide important

input into the emerging state-level coordination framework. Additionally, MDA staff will assist in adapting project results to produce sample maps and data for communicating which sites are prioritized, and why, in a user-friendly manner suitable for stakeholder meetings and other forms of civic engagement in locally led restoration/protection efforts. This communication will benefit other Minnesota watersheds that may want to conduct similar projects.

**Status as of January 31, 2012:** As there have been no results yet acquired for this project, no dissemination of results has occurred.

**Status as of June 30, 2012:** As there have been no results yet acquired for this project, no dissemination of results has occurred.

**Status as of January 31, 2013:** As there have been no results yet acquired for this project, no dissemination of results has occurred.

**Status as of June 30, 2013:** As there have been no results yet acquired for this project, no dissemination of results has occurred.

**Status as of January 31, 2014:**

Preliminary results of the study have been delivered to the Partnership and shared with SWCD partners. This data and the study were referenced in the application for a BWSR Targeted Watershed Demonstration Program application. Being that the data is still considered to be preliminary and the final report has not been released yet we have not posted anything on our web site.

**Final Report Summary:**

Project information was disseminated to project partners on an ongoing basis (usually quarterly to semi-annually) through meetings and presentations arranged by Zumbro Watershed Partnership in Rochester. In addition, individual meetings were held with the SWCD and NRCS staff in the Olmsted, Dodge, Wabasha and Goodhue County offices to convey our findings and solicit feedback on the development of guidance for assessing BMP suitability for various sites, based on agroecoregion location and site characteristics. A similar meeting was held with Rochester staff to discuss BMP priorities for urban and suburban applications. The digital terrain analysis manual content was disseminated to the project partners through a training session in Rochester.

**VI. PROJECT BUDGET SUMMARY:**

**A. ENRTF Budget:**

<b>Budget Category</b>	<b>\$ Amount</b>	<b>Explanation</b>
Personnel:	\$ 7,000	Project Coordination - Lawrence Svien (Zumbro Watershed Partnership), .1 FTE 90% salary 10% benefits for 2.25 years.
Professional/Technical Contracts:	\$ 141,000	Contractor Barr Engineering for the LiDAR/GIS analysis and the in-field verification of the LiDAR analysis; Contractor Barr Engineering for the development and execution of the 50 in-field assessments; Contractor Barr Engineering to facilitate final site prioritization and BMP implementation planning, and training of Zumbro Watershed Partnership partners.
Equipment/Tools/Supplies:	\$ 500	Rental space for GIS lab to train Zumbro Watershed Partnership partners. This is intended to be an all-day workshop held at either Winona State

		University or UM Rochester for approximately 10-15 people.
Printing:	\$ 500	Printing of: maps highlighting erosion hot spots; standard procedure protocol; reports from the 50 in-field assessments; and other training documents and documents for distribution.
Travel Expenses in MN:	\$ 1000	Mileage (\$.50/mile) for six SWCD partners to attend two training sessions to be held in Rochester and/or Winona. SWCD partners will be traveling from Goodhue, Wabasha, Dodge Center, Rochester, Owatonna and Faribault.
<b>TOTAL ENRTF BUDGET:</b>		<b>\$ 150,000</b>

**Explanation of Use of Classified Staff:** NA

**Explanation of Capital Expenditures Greater Than \$3,500:** NA

**Number of Full-time Equivalent (FTE) funded with this ENRTF appropriation:** .01 FTE (Lawrence Svien, Zumbro Watershed Partnership)

**B. Other Funds: Cash**

Source of Funds	\$ Amount Proposed	\$ Amount Spent	Use of Other Funds
<b>State</b>			
MPCA (Contract with ZWP executed 4/28/11)	\$ 12,000	\$ ,8427	Inventory of agricultural stabilization structures in the Zumbro Watershed that will assist in final project prioritization.
<b>TOTAL OTHER FUNDS:</b>	<b>\$ 12,000</b>	<b>\$ 8,427</b>	

**Other Funds: In-Kind**

Source of Funds	\$ Amount Proposed	\$ Amount Spent	In-Kind Description
<b>State</b>			
MDA	\$ 12,500	\$ 12,500 (assistance in RFP development)	230 hours of in-kind technical assistance.
<b>Local</b>			
Six SWCDs (Goodhue, Wabasha, Olmsted, Rice, Steele, Dodge)	\$ 7,500	\$ 12,000 (assistance in RFP development and review)	30 hours each of in-kind assistance through landowner contact, project prioritization and training in the protocols.
<b>TOTAL OTHER FUNDS:</b>	<b>\$ 20,000</b>	<b>\$ 24,500</b>	

**VII. PROJECT STRATEGY:**

**A. Project Partners:** The Zumbro Watershed Partnership will be the fiscal agent and only organization to receive ENRTF funds. Other partners include:

Skip Langer, Olmsted Soil and Water Conservation District

Beau Kennedy, Goodhue Soil and Water Conservation District

Jen Dankers, Wabasha Soil and Water Conservation District

Jim Hruska, Dodge Soil and Water Conservation District

Steven Pahs, Rice Soil and Water Conservation District

Dan Arndt, Steele Soil and Water Conservation District

Adam Birr, Minnesota Department of Agriculture

Barbara Weisman, Minnesota Department of Agriculture

**B. Project Impact and Long-term Strategy:** Currently, BMPs in the Zumbro Watershed are implemented opportunistically because a coordinated, watershed-wide approach for identifying critical sources of nonpoint source pollution, prioritizing sites and planning implementation projects is absent. In 2010, the MDA disseminated information on a new methodology for efficiently identifying and ranking critical areas of soil erosion and surface runoff across a watershed. This project will be among the first to utilize this methodology across an entire major watershed to identify and prioritize a list of water resotation and protection projects that will achieve the most measurable improvement in water quality. This prioritized project list will increase local competitiveness in securing grants from other sources to fund implementation of these projects. Additionally, Zumbro Watershed Partnership partners will be trained in these protocols so they can monitor changing conditions to update the list of priority projects as necessary. The MDA is a partnering agency on this project and will collaborate with other state agencies to help disseminate results to other Minnesota local government units that may want to conduct similar projects.

**C. Spending History:** NA

**VIII. ACQUISITION/RESTORATION LIST:** NA

**IX. MAP(S):** See attached file

**X. RESEARCH ADDENDUM:** NA

**XI. REPORTING REQUIREMENTS:**

**Periodic work plan status update reports will be submitted not later than January 31 2012, June 30 2012, January 31 2013 and June 30, 2013. A final report and associated products will be submitted between November 30 and December 31, 2014 as requested by the LCCMR.**



Attachment A: Budget Detail for M.L. 2011 (FY 2012-13) Environment and Natural Resources Trust Fund Projects										
<b>Project Title:</b> Zumbro River Watershed Restoration Prioritization										
<b>Legal Citation:</b> M.L. 2011, First Special Session, Chp. 2, Art.3, Sec. 2, Subd. 05d										
<b>Project Manager:</b> Lawrence Svien										
<b>M.L. 2011 (FY 2012-13) ENRTF Appropriation:</b> \$150,000										
<b>Project Length and Completion Date:</b> 3 years; June 30, 2014										
<b>Date of Update:</b> June 30, 2014										
ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET			Activity 1 Budget	Amount Spent	Balance	Activity 2 Budget	Amount Spent	Balance	TOTAL BUDGET	TOTAL BALANCE
BUDGET ITEM			<i>LiDAR/GIS Screening for Critical Areas</i>			<i>Prioritization and BMP Implementation</i>				
<b>Personnel (Wages and Benefits)</b>			\$3,500	\$3,493	\$7	\$3,500	\$3,500	\$0	\$7,000	\$7
Project Coordination - Lawrence Svien (Zumbro Watershed Partnership), .1 FTE 92% salary; 8% benefits for 2.25 years										
<b>Professional/Technical Contracts</b>										
Barr Engineering: LiDAR/GIS analysis, in-field verification, determination of threshold value for Zumbro Watershed, preliminary ranked list of critical areas			\$62,600	\$61,994	\$606	\$0		\$0	\$62,600	\$606
Barr Engineering: Development of protocol and execution of 50 in-field assessments.						\$61,620	\$61,375	\$245	\$61,620	\$245
Barr Engineering: Facilitation of prioritization & BMP implementation planning, and conduction of Zumbro Watershed Partnership partner training.						\$16,780	\$6,000	\$10,780	\$16,780	\$10,780
<b>Equipment/Tools/Supplies</b>										
Rental space for GIS lab to train Zumbro Watershed Partnership Partners. This is intended to be an all-day workshop held at either Winona State University or UM Rochester for approx. 10-15 people.						\$500	\$275	\$225	\$500	\$225
<b>Printing</b> (maps of erosion hot spots, standard procedure protocol, reports from the 50 in-field assessments, and other training documents and documents for distribution)			\$100	\$100	\$0	\$400	\$400	\$0	\$500	\$0
<b>Travel expenses in Minnesota</b>										
Mileage (\$.50/mile) for six SWCD partners to attend two training sessions to be held in Rochester and/or Winona. SWCD partners will be traveling from Goodhue, Wabasha, Dodge Center, Rochester, Owatonna and Faribault.						\$1,000	\$157	\$843	\$1,000	\$843
<b>COLUMN TOTAL</b>			<b>\$66,200</b>	<b>\$65,587</b>	<b>\$613</b>	<b>\$83,800</b>	<b>\$71,707</b>	<b>\$12,093</b>	<b>\$150,000</b>	<b>\$12,706</b>

# Zumbo Watershed Critical Source Areas

