

Projects Committee Meeting

Lower Platte North NRD Office
P.O. Box 126
Wahoo, NE 68066

Thursday, August 28, 2014 8:30 AM

Matt Bailey: Present

Bob Clausen: Present

Eric Gottschalk: Present

John Hannah: Present

Donald Kavan: Present

Robert Meduna: Present

John Miyoshi: Present

Tom Mountford: Present

Mike Murren: Present

Ralph Pieke: Present

1. SWCP

1.A. SWCP Approvals

SWCP Approvals:

50%

75%

BRT Farms	Saunders	Flow Meter	
\$625.00			
Don Yindrick	Butler (Skull Cr.)	Terraces/Tile/Basins	
\$12,500.00			
Gary Vandenberg	Butler	Flow Meter	\$625.00
Daryl Glodowski	Colfax	Terraces/Tile	
\$12,500.00			
Robert Schmit	Butler	Planned Grazing(EQIP)	
\$340.83 (14%)			
Gary Mintken	Dodge	Diversion/Waterway	
\$2,712.20			

(complete project approved last year)

1.B. SWCP Payments

SWCP Payments:

50%

75%

15%

Raymond Sedlacek	Terraces/Tile (w/EQIP)	\$ 1,548.57
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1.C. Sand & Duck Creek Payments

Raymond Sedlacek	Terraces/Tile (w/EQIP)	\$
2,576.19		

1.D. Cottonwood Creek Payments

Richard and Robert Paseka	Terraces/Tile (w/EQIP)	\$
12,500		

1.E. Wahoo Creek Watershed Payment

Richard and Robert Paseka	Lands for Conservation	100 acres
\$ 22,000		

2. WATERSHEDS

2.A. Shell Creek Grant Applications - 8:30 a.m.

Last month, the Board approved an agreement with EA Engineering to complete EPA 319 and Environmental Trust grant applications for the Shell Creek Watershed. Dan Bigbee and Jamie Suing, EA Engineering, were present to review draft applications and answer questions.

2.B. Shell Creek Watershed Plan Update

The Shell Creek Watershed Water Quality Plan draft is complete and being reviewed by NDEQ, SWIG & LPNNRD. An open house to present the plan for public input will be 5:30 - 7:30 p.m. at the Platte Center Auditorium on September 18, 2014.

2.C. Shell Creek Landowner Levee Project Update

Director Bailey reported that the engineer is working on the no-rise certificate that is required by the City of Schuyler before they can proceed with the project.

2.D. Wahoo Creek Watershed - Water Quality Plan Phase I

JEO has began work on Phase I of the Wahoo Water Quality Plan that include a detailed analysis of the Wahoo Creek Watershed priority sub-basins and land treatment practices. If an invoice is received from JEO for work completed by the Board Meeting, a motion to pay will be requested.

3. LOWER PLATTE RIVER CORRIDOR ALLIANCE

3.A. LPRCA Monthly Report

Meghan Sittler's July LPRCA report is attached. Her August report will be attached by Board Meeting.

4. OTHER

4.A. Army COE 205 Projects

4.A.1. Fremont 205

4.A.2. Schuyler 205

The project is 65% complete overall. A new construction deadline has been extended to October 15th due to weather related delays. Some of the delays are due to area landowners and irrigation runoff from fields adjacent to construction area.

4.B. Shell Creek Landowner Levee Project Update

4.C. All Hazard Mitigation Plan Update- JEO Progress Report and Invoice

JEO is working on community follow-up for completing our Hazard Mitigation Plan. Dates for public meetings are tentatively scheduled for October 9, 14 & 16.

4.D. Platte County/Mark Luchinger Grade Stabilization Project Update

Mountford and Heimann met with with Platte County on August 22 to discuss a potential grade stabilization project on landowner Mark Luchinger's property. The County is replacing a bridge with three 9 foot culverts at this location and the landowner desires that

the County and LPNNRD work with him to stabilize an eroding drainage on his property. The County will be discussing this topic in the near future.

4.E. Review of Projects Financial Statement

5. SAND CREEK ENVIRONMENTAL RESTORATION PROJECT REPORT

5.A. Lake Wanahoo

5.A.1. County Road 17 Paving/Entrance to Wanahoo

Bids were opened by the County on August 26th and ME Collins was low bid for paving County Road 17. The County will approve and award the bid at their September 2nd meeting.

5.A.2. Income and Expense Lake Wanahoo

Attached find income and expense summaries from Game and Parks and the NRD's monthly expense summary.

5.A.3. Lake Wanahoo Trails

The City of Wahoo is recommending a resolution to authorize Mayor to sign documents for federal assistance for development of the Lake Wanahoo Trails Project - Phase II.

5.A.4. Hwy 77 Bypass Project

Work on the dam road will begin on September 8th. Staff has allowed the Contractor, Constructors Inc. a small area on the West side of the dam to store millings and supplies for the roadway in exchange for the rock surfacing to be stockpiled for future use within the Park.

5.B. Upstream Structures

All dams are full and functioning as designed. Staff is looking into fall spraying and seeding on some areas.

6. WESTERN SARPY/CLEAR CREEK LEVEE REPORT

Segment 4B of the Western Sarpy/Clear Creek Project was awarded to Klocke Inc. of Palmyra, MO with a bid of \$2,894,834. Contractor has mobilized, started clearing and grubbing trees and placement of fill within the area.

7. ADJOURNMENT

With no further business, the Projects Committee Meeting adjourned at 10:00 a.m.

INSERT LETTER FROM LPNNRD SUPPORTING PROJECT AND FINAICAL MATCH
EXPLANATION



NEBRASKA ENVIRONMENTAL TRUST FUND

APPLICATION COVER SHEET

Instructions to word processing users. Double click on each slash character (“ \ ”), including the ones below in the header, and replace them with your entry. Use your find function (Ctrl + F) to find the slash character “\”. This will position your cursor at each response.

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

3. County(s) where project is located: Boone, Platte, and Colfax 4. Nearest town: Platte Center

5. Total Amount Requested: \$145,000 6. Years of funding requested (select one): 2

Contact Person:

7. Name: Tom Mountford 8. Title: Assistant Manager

9. Organization: Lower Platte North Natural Resources District (LPNNRD)

10. Address, City, State & Zip: 511 Commercial Park Road, Wahoo, NE 68066

11. Daytime Phone: 402-443-4675 12. Alternate phone: \ 13. Fax: 402-443-5339

14. E-mail: tmountford@lpnrd.org 15. Sponsor web site: www.shellcreek.org

16. Is this a continuation request for a project previously funded by the Trust: YES NO: NO
Is this a resubmission of a project application previously not funded by the Trust: YES NO: NO

17. Please indicate which category best describes the applicant: Consortium
Selections are: Individual City or County Natural Resources District Federal Agency Private for Profit
Private Nonprofit Consortium School, Irrigation, Power or Development District State Agency Other (specify):

18. Will this project receive federal funds or require a federal review or permit? YES NO: YES
If yes, identify the agency(s) and its role: NDEQ funding approval requires a Project Implementation Plan by the USEPA. Project design will include Nebraska Game and Parks Commission and U.S. Fish and Wildlife Service project reviews and U.S. Army Corps of Engineers 404 permits.

19. Will this project receive other State of Nebraska funds or require a state review or permit? YES NO: NO
If yes, identify the agency(s) and its role:

20. In **300 words or less** provide an overview of the project for which you seek funding. If you are asking the Trust to fund only a portion of the project, indicate the components for which you seek funding.

The Shell Creek Watershed Improvement Group (SCWIG) has been working since 1999 to increase resource conservation and instill a strong ethic of land stewardship. Recently, SCWIG and Lower Platte North Natural Resources District created the Shell Creek Environmental Enhancement Plan and project partners are ready to move forward with projects. The plan’s implementation strategy includes the traditional conservation management practices and stream restoration practices as outlined in the Shell Creek Geomorphic Assessment. The assessment determined that Shell Creek has incised 10 to 25 feet below its pre-disturbance elevation resulting in high, over-steepened banks, and Shell Creek itself is in a state of degradation and widening. In essence, Shell Creek is now naturally making a new floodplain within the banks we see today.

Several stream restoration practices have been recommended to systematically improve stream conditions and create aquatic habitat. Several knickpoints were noted during the field assessment, and an opportunity exists to greatly limit future incision. Grade control of the Shell Creek tributaries will mitigate the incision within the tributaries. Re-connection of Shell Creek to relic oxbows, essentially creating bench wetlands, would provide flood storage, filter pollutants, and create aquatic and wildlife habitat. Streambank stabilization using a bio-engineering technique called log cribwalls will increase the aquatic



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APPLICATION COVER SHEET

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H1. Project Sponsor: Shell Creek Watershed Improvement Group

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habitat within the stream. SCWIG should work with County officials to utilize log cribwalls in future projects. A channel and floodplain bench can be excavated at the existing bed elevations within the existing banks, called re-meandering, thus increasing capacity and re-creating a more natural floodplain. Lastly, incentives for a suite of traditional conservation practices would be offered. SCWIG would continue their public education and outreach efforts, including one-on-one contact with agricultural producers and coordination with Newman Grove’s Science Team. NET is being requested to fund a portion of the cribwall, bench wetland, grade-control, and BMPs.

21. On behalf of the sponsor(s) named above, I hereby certify that the information contained in this application, including all attachments is true, accurate and complete.

Tom Mountford

Authorized Signature of Sponsor Organization

Assistant Manager

Title

8/28/14

Date

Tom Mountford

Typed or Printed Name of Authorized Signatory

Assistant Manager

Typed or Printed Title



NEBRASKA ENVIRONMENTAL TRUST FUND

NARRATIVE SECTION

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

In five pages or less, provide a discussion of your project. Be sure to cover the points specified in the instructions.

BACKGROUND OF PROJECT

The Shell Creek watershed encompasses more than 300,000 acres and is a major tributary of the Lower Platte River in northeast Nebraska. Cities and villages located within the Shell Creek watershed include Schuyler, population 6,211; Newman Grove, population 721; Platte Center, population 336; Lindsay, population 255 people; and nearby Columbus, population 22,111. A portion of Shell Creek is impaired due to elevated levels of bacteria, selenium, and atrazine, as well as deterioration of its ecologic health. Hydrologic modification, such as stream straightening, has occurred on 40% of the stream which exacerbates and creates further impairments.

To mitigate these problems and enhance the stream's environmental integrity, area stakeholders formed the Shell Creek Watershed Improvement Group (SCWIG) in 1999. SCWIG has led local efforts to identify, promote, and implement conservation practices with financial support from grants and Lower Platte North Natural Resources District (LPNNRD). In response to these efforts, area farmers and residents have adopted over 9,000 acres of no-till row crop, 300 acres of buffers, 101 onsite wastewater upgrades, 61 well abandonments, 2,000 acres of cover crops, among others.

Since implementing an initial watershed management plan, SCWIG and their partners have become increasingly aware that unstable channel conditions along Shell Creek are both a symptom and a cause of poor watershed conditions. In some areas, implemented BMPs have greatly reduced upland erosion and overland flow, yet unnatural forces at work in the channel continue to result in a significant sediment load. Bank and bed erosion were, and are, contributing to high sediment and nutrient loads, impairing aquatic habitat and decreasing biological productivity in the stream.

Starting in 2013, SCWIG has worked with EA Engineering, Science, and Technology (EA) and LPNNRD to establish the Shell Creek Environmental Enhancement Plan (Plan). The Plan's overall goal is to direct future efforts to restore the water quality and ecological health of Shell Creek and is non-regulatory. A key component of the Plan was the Shell Creek Geomorphic Assessment (Geomorphic Assessment) that identified specific reaches along Shell Creek, as well as major tributaries, where channel instability is a significant contributor to sediment loading in the system. Identifying these areas was the first step in developing general solutions and concepts to help the specific reaches and tributaries achieve a more stable configuration.

In 2014, the University of Nebraska-Lincoln started the Shell Creek Fish and Macroinvertebrate Assessment. Twenty-one sites throughout Shell Creek were surveyed once in June, July, and August. Preliminary results have proven that efforts in the past are improving the health of Shell Creek. Thus far, UNL has found three species of mussels and relict shells of an additional three species were also recorded. Thanks to past conservation efforts, the namesake of Shell Creek has made a return to the flowing waters. Fish species were found in over half of the sites sampled and included channel catfish, common carp, fathead minnows, green sunfish, red shiners, and sand shiners. These results are an immense improvement compared to the condition of the fishery at the time SCWIG was formed. The SCWIG is ready to continue working on improving the biological and ecologic conditions through implementation of the new Plan.

Recommended engineering modifications to improve water quality and establish aquatic habitat will include targeted stream stabilization/protection utilizing bio-engineering, wetland restoration within relict oxbows (bench wetlands), grade control within priority tributaries, re-meandering, and traditional agricultural conservation practices throughout the watershed. Additionally, public involvement and participation in watershed management practices will be vital to SCWIG's success.

LPNNRD has offered to assist SCWIG as the financial sponsor for implementation as they did with development of the Plan. LPNNRD has created the Shell Creek Sinking Fund, which is available to support implementation of projects within the watershed. SCWIG is also supported by the Natural Resources Conservation Service (NRCS) by providing a watershed coordinator.

ENVIRONMENTAL OBJECTIVES, BENEFITS, AND OUTCOMES

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

The entirety of this project is intended to enhance the environmental conditions of Shell Creek with a focus on creation of aquatic habitat, stream restoration, increased wildlife habitat, increased wetlands, pollutant load reduction, and environmental education and outreach. In addition to environmental benefits, each project will serve as a demonstration with the intent to replicate in other areas of the watershed. This project intends to at least enhance one wetland, stabilize 400-500 feet of bank including aquatic habitat features, design four grade control structures, re-meander one-half mile of stream, upgrade up to five onsite wastewater systems, enroll 3,000 acres of cover crops, decommission 10 wells, and promote environmental awareness and land stewardship.

INNOVATIVE FEATURES

A significant emphasis of this project is the use of bio-engineering, such as log cribwalls. Log cribwalls are designed to provide a long-term, sustainable solution where native vegetation replaces structural elements as they degrade. When incorporated into the structure, tree species with high growth rates, extensive root systems, and the ability to withstand saturation and periodic flooding (such as willow and cottonwood) become living structural elements, adding soil stability, providing shade, and improving the water quality.

To promote bio-engineering into future projects, the SCWIG will work directly with County officials to ensure they are aware of the Geomorphic Assessment, the Plan, and the scientific and engineering recommendations that will benefit Shell Creek. Traditional approaches to bank stabilization have featured hard engineered structures, concrete, sheet pile, rip rap etc. New developments within the industry have indicated that vegetation can provide better and more sustainable results without the design life issues of engineered structures, as well as provide more beneficial aquatic habitat.

DESIGN OF PROJECT

With the planning process complete, the SCWIG and LPNNRD has worked with EA to identify locations where varying stream restoration solutions can be effectively installed. During the preliminary engineering phase, the SCWIG, LPNNRD, and EA will work to create partnerships with private landowners to site project locations based upon general locations identified in the Plan. Below is a list of four structural practices, as well as a general discussion on Basin-wide BMPs, all of these practices have been identified in the Plan as effective tools to begin achieving the Plan's phase one goals.

Log Cribwall Stabilization

Bank stabilization has been recommended in the Plan in areas where critical public infrastructure is threatened by the widening of the creek. The SCWIG has opted to work with Counties to identify areas where stabilization is necessary and utilize bioengineering techniques such as log cribwalls. Cribwalls are a lattice-like structure of logs, placed both horizontally and vertically, with slash, local boulders, and soil intermixed within the log matrix. Cribwalls create aquatic habitat as well as stabilize stream banks. The Brewery Hill sub-watershed is as a priority location for bank stabilization (Figure 1).

Task 1: Field Survey - A field survey will be performed to validate the location selected for construction of a log cribwall for bank stabilization. In addition, survey data such as cross sections and stream slope will be collected for use in hydrologic and hydraulic (H&H) modeling in the potential location.

Task 2: Hydrologic and Hydraulic Analysis - Hydrology will be developed to document design flows and base flood elevation. Methods will rely on existing models, USGS regression methodology, and other data to develop estimates for the 2, 10, 50, and 100 year floods. Hydraulic analysis will be accomplished using HEC-RAS and will include any nearby infrastructure (bridges). This information will be used to determine the frequency of inundation, set key elevations, develop shear analysis for materials design, and determine localized inundation elevations.

Task 3: 50% Design - Design will be completed to confirm the application, define quantities, develop a plan and typical section view drawings, and prepare an engineer's estimate for construction costs. The tasks in this phase will include:

- Design Plans – two sheets, a plan view and typical section; Design Cost – and engineer's estimate of construction cost; Design Memorandum – outline the results of the H&H analysis and document and site characteristics important to the design.

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

Task 4: Permitting. Permits necessary for construction of a log cribwall at a single location will be identified.

Bench Wetland Restoration

Using LiDAR, the Plan identified approximately 18 locations where the vertical distance between the existing channel and relict oxbows are less than 7 feet and deemed feasible to create a bench wetland. The intent is to use surface water hydrology from the stream's frequent high flow events to create wetlands. Benefits include flood storage, pollutant filtration, groundwater infiltration, aquatic habitat, and wildlife habitat. Potential locations for projects have been identified in Figure 1. This project will include property owner coordination and consultation to gain access and permission.

Task 1: Field Survey - A field survey will be performed to validate the location selected for construction of a bench wetland. In addition, survey data such as cross sections and stream slope will be collected for use in hydrologic and hydraulic modeling in the potential location.

Task 2: Hydrologic and Hydraulic Analysis - Hydrology will be developed to document design flows and base flood elevation. Methods will rely on existing models, USGS regression methodology and other data to develop estimates for the 2, 10, 50, and 100 year floods. Hydraulic analysis will be accomplished using HEC-RAS and will include any nearby infrastructure (bridges). This information will be used to develop shear analysis for materials design and determine localized inundation elevations.

Task 3: 50% Design - Design will be completed to confirm the application, define quantities, develop a plan and typical section view drawings, and prepare an engineer's estimate for construction costs. The tasks in this phase will include:

- Design Plans – two sheets, a plan view and typical section; Design Cost – and engineer's estimate of construction cost; Design Memorandum – outline the results of the H&H analysis and document and site characteristics important to the design.

Task 4: Permitting - Permits necessary for construction of a bench wetland at a single location will be identified.

Shell Creek Tributary Stabilization

During the field assessment, several knickpoints (a place in a river, stream, or creek where its gradient changes and it begins to flow more steeply) were observed in the four major tributaries. Grade control is recommended in some of the tributaries where active knickpoints were observed, particularly in sections where sinuosity is low. Benefits include mitigation of active incision up through the tributary watersheds and as a result reduce sediment within the stream. Grade control riffles spaced at regular intervals may help curb areas of minor incision in sections of tributaries by changing their profile from an erosive, steep incline to a stable stair-step pattern with hardened beds at each step. These structures allow stream elevation to drop in a controlled setting, while preventing further degradation. The four tributaries that have been identified as potential locations for grade control are shown in Figure 1.

Task 1: Desktop Analysis - To support preliminary design, LiDAR, aerial photos, and profiles of the mainstems of the four major tributary systems will be used to identify site specific areas of vertical instability. Up to eight areas will be initially identified.

Task 2: Field Survey - A field survey will be performed to validate up to eight locations within the four major tributaries for grade stabilization. The field survey will include correspondence with landowners. In addition, survey data such as cross sections and stream slope will be collected for use in H&H modeling in the potential locations.

Task 2: Hydrologic and Hydraulic Analysis - Hydrology will be developed to document design flows and base flood elevation. Methods will rely on existing models, USGS regression methodology and other data to develop estimates for the 2, 10, 50, and 100 year floods. Hydraulic analysis will be accomplished using HEC-RAS and will include any nearby



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infrastructure (bridges). This information will be used to develop shear analysis for materials design and determine localized inundation elevations, and evaluate impacts of installing the grade control structures.

Task 3: 50% Design - For the four of the eight most feasible, environmental beneficial, and cost effective sites, design will be completed to confirm the application, define quantities, develop a plan and typical section view drawings, and prepare an engineer's estimate for construction costs. The tasks in this phase will include:

- Design Plans – two sheets, a plan view and typical section; Design Cost – and engineer's estimate of construction cost; Design Memorandum – outline the results of the H&H analysis and document and site characteristics important to the design.

Task 4: Permitting - Permits necessary for grade stabilization at up to four locations within the four major tributaries will be identified.

Re-Meandering

When Shell Creek incised, it lost connection to its floodplain, a surface that is typically inundated on a near annual basis. The floodplain serves as the transition between the fully aquatic stream habitat and the upland habitat, in this case prairie or agricultural land. Under current conditions, flood flows are often contained within the incised channel resulting in more erosive energy and perhaps limiting the establishment of native riparian vegetation.

Re-meandering requires excavation down to a new channel and floodplain. A channel and floodplain bench can be excavated at the existing bed elevations within the existing banks, thus increasing flood water capacity and re-creating a more natural floodplain. Additional benefits include increased aquatic habitat and wildlife habitat. The resulting channel and floodplain would resemble the future channel adjustment endpoint if left alone, especially in the downstream reaches.

- LPNNRD has identified one area in the Brewery Hill sub-watershed (Figure 1) that is being considered for re-meandering in order to increase the conveyance of Shell Creek. LPNNRD is responsible for work completed on the re-meandering project.

Basin-Wide Management Practices

Soil and water conservation management practices and improving soil health remain a high priority of SCWIG and are a critical part of Plan implementation. SCWIG would offer cost-share and financial incentives to match with existing NRCS and LPNNRD programs. Within the Plan, five main management practices identified to reduce pollutant reduction and include cover crops, terraces, water quality structures (small ponds), onsite wastewater system upgrades, and well abandonment. As part of this project, SCWIG would still offer other traditional practices such as: no-till buffer strips; sediment basins and grade stabilization structures. Education and outreach, including the use of the SCWIG Coordinator, is considered part of the basin-wide practices including continuation of the educational component of SCWIG including a quarterly newsletter sent to 1,800 residents, support of the Newman Grove Science Team's water quality monitoring, and outreach directly with agricultural producers. In addition, SCWIG signage throughout the watershed will also be updated to advertise the new efforts.

MEASURES TO MAXIMIZE COST EFFECTIVENESS

Structural recommendations are a result of the Geomorphic Assessment that was completed during the establishment of the Plan in 2014. These recommendations are the result of a desktop and field assessment completed by professional engineers and fluvial geomorphologists. Conservation practices selected for implementation were based upon their capability to reduce nutrients, pesticides, and sediments from entering Shell Creek, as well as land user willingness to participate.

CONTRIBUTING PARTNERS

Lower Platte North Natural Resources District – grant administration, technical assistance, education and outreach, and financial contributor; Nebraska Department of Environmental Quality – technical assistance, funding, and education and



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H1. Project Sponsor: Shell Creek Watershed Improvement Group

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outreach; Natural Resources Conservation Service – SCWIG coordinator, technical assistance, financial assistance, education and outreach; EA Team – preliminary engineering, design, permitting, and property owner coordination.

SOCIAL, ECONOMIC, and PUBLIC BENEFITS

SCWIG has already made remarkable progress towards improving environmental stewardship and water quality in Shell Creek and a new set of tools are available with development of the new plan. With improved water quality comes an improved aquatic habitat, thus the re-introduction of game fish such as channel catfish. The public will benefit with the opportunity for youth to fish channel catfish in Shell Creek. With implementation of the new Plan, this opportunity will only become stronger.

MAINTENANCE and EVALUATION

LPNNRD has an ongoing partnership with SCWIG and will be responsible for assisting with maintenance needs. Also, SCWIG will approach each area county as a working partner, potentially including construction and maintenance responsibilities in the future. The project's success will be evaluated by quantifying the increase in functional wetlands, measuring the number of conservation management practices, and post-project visual assessments to evaluate the structural performance. Project evaluation and success will serve as a basis for replicating practices to other priority areas in the future.

LIST OF FEDERAL/STATE PERMITS OR APPROVALS

Nebraska Game and Parks Commission and U.S. Fish and Wildlife Service - endangered or threatened species consultation; Nebraska State Historical Society - historical, cultural, or social resources consultation; U.S. Army Corps of Engineers – 404 permitting; and NDEQ and EPA - Section 319 Nonpoint Source Program Project Implementation Plan approval.

FEATURE PROGRAM BONUS

- 1) This project is a regional watershed-based activity benefiting over 300,000 acres with a focus on in-stream ecological improvements.
- 2) This project uses multiple informational and educational components to reach a large area of land users to promote sound resource management practices, including workshops, demonstrations, newsletters, news releases, brochures, radio ads, websites, and individual, one-on-one contacts. The project is guided by a Plan which included education, outreach, and public involvement.
- 3) This project includes representatives from both private and public sector in comprehensive planning, design, and evaluation. The SCWIG is comprised of 10 dedicated private landowners.
- 4) This project recognizes the current community/cultural and economic values that affect decision-making and design. Private land users and governmental officials have discussed these values in detail and have worked out the best means to achieve sustainable results based on local producer's intimate knowledge of the culture, economic conditions, and attitudes. Youth involvement, especially the Newman Grove Science Team, is a priority of SCWIG.
- 5) This project strategically addresses change across a large watershed by systematically targeting specific sub-watersheds and stream reaches; and using public/private partnerships involving many entities. SCWIG will work with County officials to encourage incorporation of bio-engineering techniques and use projects listed in this application as demonstrations to promote further implementation in Shell Creek and beyond.



NEBRASKA ENVIRONMENTAL TRUST FUND APPLICATION BUDGET SUMMARY

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

BUDGET YEAR: SUMMARY/1 YEAR ONLY

Column A	Column B	Column C	Column D	Column E	Column F
1. Source of Funds ▶	Nebraska Environmental Trust	NDEQ	LPNNRD		TOTALS ▼
2. Budget Category ▼					
3. Crib Wall Stabilization	\$20,000	\$30,000			\$50,000
4. Bench Wetlands	\$45,000				\$45,000
5. Tributary Stabilization	\$60,000	\$100,000			\$160,000
6. Re-Meandering			\$80,000		\$80,000
7. Land Treatment	\$5,000	\$35,000	\$20,000		\$60,000
8. Coordinator/I&E	\$15,000				\$15,000
9. Onsite System Upgrades		\$25,000			\$25,000
10. SCWIG Updated Signage	\$10,000	\$10,000			\$25,000
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18. TOTALS ▶	\$155,000	\$200,000	\$100,000		\$455,000



NEBRASKA ENVIRONMENTAL TRUST FUND APPLICATION BUDGET YEAR ONE

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

BUDGET YEAR: ONE

(This page is used by multi-year grants only. If your project is not a multi-year grant, then ignore or delete this page.)

Column A	Column B	Column C	Column D	Column E	Column F
1. Source of Funds ►	Nebraska Environmental Trust	NDEQ	LPNNRD		TOTALS ▼
2. Budget Category ▼					
3. Crib Wall Stabilization	\$20,000	\$30,000			\$50,000
4. Bench Wetlands	\$45,000				\$45,000
5. Tributary Stabilization	\$40,000	\$70,000			\$110,000
6. Re-Meandering			\$40,000		\$40,000
7. Land Treatment	\$5,000	\$10,000	\$10,000		\$25,000
8. Coordinator/I&E	\$7,500				\$7,500
9. Onsite System Upgrades		\$12,500			\$12,500
10. SCWIG Updated Signage	\$10,000	\$10,000			\$20,000
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18. TOTALS ►	\$127,500	\$132,500	\$50,000		\$310,000



NEBRASKA ENVIRONMENTAL TRUST FUND APPLICATION BUDGET YEAR TWO

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

BUDGET YEAR: TWO

(This page is used by multi-year grants only. If your project is not a multi-year grant, then ignore or delete this page.)

Column A	Column B	Column C	Column D	Column E	Column F
1. Source of Funds ►	Nebraska Environmental Trust	NDEQ	LPNNRD		TOTALS ▼
2. Budget Category ▼					
3. Crib Wall Stabilization					
4. Bench Wetlands					
5. Tributary Stabilization	\$20,000	\$30,000			\$50,000
6. Re-Meandering			\$40,000		\$40,000
7. Land Treatment		\$25,000	\$10,000		\$35,000
8. Coordinator/I&E	\$7,500				\$7,500
9. Onsite System Upgrades		\$12,500			\$12,500
10. SCWIG Updated Signage					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18. TOTALS ►	\$27,500	\$67,500	\$50,000		\$145,000



NEBRASKA ENVIRONMENTAL TRUST FUND

APPLICATION BUDGET JUSTIFICATION

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

1. Have other sources of funding not listed in the Budget Worksheet been approached for project support? If yes, name them and explain the outcome of your request.

Not applicable.

2. Are all of the matching funds in the Budget Worksheet confirmed? If not, please identify those entities and list the date when confirmation is expected. Explain how you will implement the project if these sources do not confirm participation.

Yes, LPNNRD currently has \$100,000 in the Shell Creek Sinking Fund.

3. If any of the project costs identified in Column B of the Budget Worksheet have been expended or if debt has been incurred for these costs or a sponsor or partner is obligated for these costs in any other way: List these costs here. Explain clearly why Trust grant funds are requested for these costs.

Not applicable.

4. For each line item in column A of the Budget Worksheet, justify the basis for the dollar amount indicated for that item.

CATEGORY/COMPONENT (from Column A of the Budget Worksheet)	BASIS USED TO DETERMINE COST	Attachment? Y or N	ATTACHMENT LABEL
3. Crib Wall Stabilization	Engineers Estimate	Y	Attachment A
4. Bench Wetlands	Engineers Estimate	Y	Attachment A
5. Tributary Stabilization	Engineers Estimate	Y	Attachment A
6. Re-Meandering	LPNNRD Estimate	N	NA
7. Land Treatment	LPNNRD Estimate	N	NA
8. Coordinator/I&E	LPNNRD Estimate	N	NA
9. Onsite System Upgrades	LPNNRD Estimate	N	NA
10. SCWIG Updated Signage	LPNNRD Estimate	N	NA
11.			
12.			
13.			
14.			
15.			
16.			
17.			



EA Engineering, Science,
and Technology, Inc.

221 Sun Valley Blvd., Suite D
Lincoln, NE 68528
Telephone: 402.476.3766
Fax: 402.476.7825
www.eaest.com

August 25, 2014

To: Shell Creek Watershed Improvement Group

RE: **Shell Creek Environmental Enhancement Plan Implementation
Nebraska Environmental Trust Grant Application - 2014**

The purpose of this letter is to provide a budgetary cost estimate to complete three contractual activities included in the Shell Creek Watershed Improvement Group's Nebraska Environmental Trust funding application. EA Engineering, Science, and Technology, Inc.'s engineering cost estimate is based upon previous work completed during establishment of the Shell Creek Environmental Enhancement Plan and follow-up work based upon specific actions identified to be funded through this application. Each activity below includes effort to complete 50% preliminary design, including field survey, property owner correspondence, hydrologic and hydraulic analysis, preparation of engineer's estimate for construction cost, and identification of necessary permits.

CONTRACTUAL ACTIVITY	COST ESTIMATE
Log Cribwall	\$50,000
Bench Wetland	\$45,000
Tributary Grade Stabilization	\$160,000

If I can be of any further assistance, please contact me at 402-476-3766 or jsuing@eaest.com.

Sincerely,

A handwritten signature in black ink that reads 'Jamie Suing'. The signature is written in a cursive, flowing style.

Jamie Suing, PE



NEBRASKA ENVIRONMENTAL TRUST FUND PROJECT SPONSOR FINANCIAL INFORMATION

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

INSERT JPG OF LPNNRD FINANCIAL SUMMARY



NEBRASKA ENVIRONMENTAL TRUST FUND

TIMELINE

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

See instructions for section D.

Month/Year	Task Description:
Nov 2014	NRD planning of re-meandering project
Dec 2014 – Nov 2016	Promote and implement BMPs in Shell Creek watershed
May 2015	Complete agreements with funding sources
May 2015	Begin outreach to counties and private land owners
May 2015	Begin preliminary design of cribwall, bench wetland, and grade control structures
Jul 2015	NET Quarterly Report
Sept 2015	Preliminary design of cribwall and bench wetland complete
Oct-2015	NET Quarterly Report
	NDEQ Semi-annual Report
Jan 2016	NET Quarterly Report
Feb 2016	Preliminary design of grade control structures complete
Mar 2016	NDEQ Semi-annual Report
April 2016	NET Quarterly Report
Jun 2016	NET Quarterly Report
Oct 2016	NET Quarterly Report
	NDEQ Semi-annual Report
Dec 2016	NET Quarterly Report
Feb 2017	NET Quarterly Report
March 2017	NDEQ Semi-annual Report
April 2017	NET Quarterly Report
June 2017	Final Reporting for NET and NDEQ 319



NEBRASKA ENVIRONMENTAL TRUST FUND REAL ESTATE / SITE PLAN

H1. Project Sponsor: Shell Creek Watershed Improvement Group

H2. Project Name: Shell Creek Environmental Enhancement Plan Implementation

This section will not apply to every project. Please see instructions for section F. Attachments should be sent with the hardcopy submission.

No property will be purchased or acquired through this project. Private property will be improved and/or restored through this project and Nebraska Environmental Trust funding. The improvements and restoration of private properties will be through the application of conservation practices and stream restoration practices that will provide greater public benefit value than the dollar amount of the grant. The ecosystem will be significantly improved through improved aquatic habitat, improved soil health, water conservation, and through reduction of soil erosion, surface water runoff, and pollutants entering the surface waters.

The Project Boundary is provided as Attachment B in this Section.

2014 NPS PROPOSAL APPLICATION FORMS

1. Project Title:

2. Sponsor Contact Information	
Organization	Shell Creek Watershed Improvement Group
DUNS #	602681520 (LPNNRD)
Street Address	511 Commercial Park Rd.
City	Wahoo
State	Nebraska
Zip	68066
Primary Contact	Tom Mountford, Assistant Manager
Phone Number	402-443-4675
E-mail Address	tmountford@lpnnrd.org

3. Partners		
Organization	Contact Name	Phone Number
USDA-NRCS	Melissa Foreman	402-564-0506
Lower Platte North NRD	Tom Mountford	402-443-4665

4. Project Location (closest city): Platte Center

5. Project Period (month/year) : Start Date: 12/1/2014 End Date: 12/1/2016

6. Budget Summary	
Source	Dollar Amount
319 Funds	\$200,000
Non-Federal Funds	\$255,000
Other Federal Funds	\$0
Total	\$455,000

7. Project Type (Check One)

- Watershed Local Outreach
 Waterbody Statewide Outreach
 Groundwater Area

8. Has the sponsor received any previous Section 319 Grants? YES NO

9. In **the space below** provide a brief overview of the project for which you seek funding. Fit this overview within the box below. If you are asking for 319 Funds for only a portion of the overall project, indicate the components for which you seek funding.

The Shell Creek Watershed Improvement Group (SCWIG) has been working since 1999 to increase resource conservation and instill a strong ethic of land stewardship. Recently, SCWIG and Lower Platte North Natural Resources District created the Shell Creek Environmental Enhancement Plan and project partners are ready to move forward with projects. The plan's implementation strategy includes the traditional conservation management practices and stream restoration practices as outlined in the Shell Creek Geomorphic Assessment. The assessment determined that Shell Creek has incised 10 to 25 feet below its pre-disturbance elevation resulting in high, over-steepened banks, and Shell Creek itself is in a state of degradation and widening. In essence, Shell Creek is now naturally making a new floodplain within the banks we see today. Several stream restoration practices have been recommended to systematically improve stream conditions and create aquatic habitat. Several knickpoints were noted during the field assessment, and an opportunity exists to greatly limit future incision. Grade control of the Shell Creek tributaries will mitigate the incision within the tributaries. Re-connection of Shell Creek to relic oxbows, essentially creating bench wetlands, would provide flood storage, filter pollutants, and create aquatic and wildlife habitat. Streambank stabilization using a bio-engineering technique called log cribwalls will increase the aquatic habitat within the stream. SCWIG should work with County officials to utilize log cribwalls in future projects. A channel and floodplain bench can be excavated at the existing bed elevations within the existing banks, called re-meandering, thus increasing capacity and re-creating a more natural floodplain. Lastly, incentives for a suite of traditional conservation practices would be offered. SCWIG would continue their public education and outreach efforts, including one-on-one contact with agricultural producers and coordination with Newman Grove's Science Team. NET is being requested to fund a portion of the cribwall, bench wetland, grade-control, and BMPs. In addition, NET funds are requested to update SCWIG signage throughout the watershed to advertise new efforts.

10. Budget

BUDGET CATEGORY	SOURCE of FUNDS			
	Section 319 Funds	Other Federal Funds ¹	Non-Federal Funds ²	TOTAL
Personnel				
Coordinator/I&E	\$0	\$0	\$15,000	\$15,000
Material & Supplies	NA	NA	NA	NA
Travel	NA	NA	NA	NA
Equipment	NA	NA	NA	NA
Contractual				
Onsite WW Upgrades	\$25,000	\$0	\$0	\$25,000
Cribwall	\$30,000	\$0	\$20,000	\$50,000
Tributary Stabilization	\$100,000	\$0	\$60,000	\$160,000
Bench Wetlands	\$0	\$0	\$45,000	\$45,000
Land Treatment	\$35,000	\$0	\$25,000	\$60,000
Re-meandering	\$0	\$0	\$80,000	\$80,000
SCWIG Updated Signage	\$10,000		\$10,000	\$20,000
TOTALS	\$200,000	\$0	\$255,000	\$455,000

1. Sources of Other Federal Funding

Name	Amount \$
NA	\$0

2. Sources of Non-Federal Funding

Name	Amount \$
Lower Platte North NRD	\$100,000
Nebraska Environmental Trust	\$155,000

**11. Project Description (Use either Format 1 or 2 depending on your project type)
(Please attach your description to the Proposal Application Forms)**

In five pages or less, provide a discussion of your project. Be sure to cover the points specified in the instructions.

BACKGROUND OF PROJECT

The Shell Creek watershed encompasses more than 300,000 acres and is a major tributary of the Lower Platte River in northeast Nebraska. Cities and villages located within the Shell Creek watershed include Schuyler, population 6,211; Newman Grove, population 721; Platte Center, population 336; Lindsay, population 255 people; and nearby Columbus, population 22,111. A portion of Shell Creek is impaired due to elevated levels of bacteria, selenium, and atrazine, as well as deterioration of its ecologic health. Hydrologic modification, such as stream straightening, has occurred on 40% of the stream which exacerbates and creates further impairments.

To mitigate these problems and enhance the stream's environmental integrity, area stakeholders formed the Shell Creek Watershed Improvement Group (SCWIG) in 1999. SCWIG has led local efforts to identify, promote, and implement conservation practices with financial support from grants and Lower Platte North Natural Resources District (LPNNRD). In response to these efforts, area farmers and residents have adopted over 9,000 acres of no-till row crop, 300 acres of buffers, 101 onsite wastewater upgrades, 61 well abandonments, 2,000 acres of cover crops, among others.

Since implementing an initial watershed management plan, SCWIG and their partners have become increasingly aware that unstable channel conditions along Shell Creek are both a symptom and a cause of poor watershed conditions. In some areas, implemented BMPs have greatly reduced upland erosion and overland flow, yet unnatural forces at work in the channel continue to result in a significant sediment load. Bank and bed erosion were, and are, contributing to high sediment and nutrient loads, impairing aquatic habitat and decreasing biological productivity in the stream.

Starting in 2013, SCWIG worked with EA Engineering, Science, and Technology (EA) and LPNNRD to establish the Shell Creek Environmental Enhancement Plan (Plan). The Plan's overall goal is to direct future efforts to restore the water quality and ecological health of Shell Creek and is non-regulatory. A key component of the Plan was the Shell Creek Geomorphic Assessment (Geomorphic Assessment) that identified specific reaches along Shell Creek, as well as major tributaries, where channel instability is a significant contributor to sediment loading in the system. Identifying these areas was the first step in developing general solutions and concepts to help the specific reaches and tributaries achieve a more stable configuration.

In 2014, the University of Nebraska-Lincoln started the Shell Creek Fish and Macroinvertebrate Assessment. Twenty-one sites throughout Shell Creek were surveyed once in June, July, and August. Preliminary results have proven that efforts in the past are improving the health of Shell Creek. Thus far, UNL has found three species of mussels and relict shells of an additional three species were also recorded. Thanks to past conservation efforts, the namesake of Shell Creek has made a return to the flowing waters. Fish species were found in over half of the sites sampled and included channel catfish, common carp, fathead minnows, green sunfish, red shiners, and sand shiners. These results are an immense improvement compared to the condition of the fishery at the time SCWIG was formed. The SCWIG is ready to continue working on improving the biological and ecologic conditions through implementation of the new Plan.

Recommended engineering modifications to improve water quality and establish aquatic habitat will include targeted stream stabilization/protection utilizing bio-engineering, wetland restoration within relict oxbows (bench wetlands), grade control within priority tributaries, re-meandering, and traditional agricultural conservation practices throughout the watershed. Additionally, public involvement and participation in watershed management practices will be vital to SCWIG's success.

LPNNRD has offered to assist SCWIG as the financial sponsor for implementation as they did with development of the Plan. LPNNRD has created the Shell Creek Sinking Fund, which is available to

support implementation of projects within the watershed. SCWIG is also supported by the Natural Resources Conservation Service (NRCS) by providing a watershed coordinator.

ENVIRONMENTAL OBJECTIVES, BENEFITS, AND OUTCOMES

The entirety of this project is intended to enhance the environmental conditions of Shell Creek with a focus on creation of aquatic habitat, stream restoration, increased wildlife habitat, increased wetlands, pollutant load reduction, and environmental education and outreach. In addition to environmental benefits, each project will serve as a demonstration with the intent to replicate in other areas of the watershed. This project intends to at least enhance one wetland, stabilize 400-500 feet of bank including aquatic habitat features, design four grade control structures, re-meander one-half mile of stream, upgrade up to five onsite wastewater systems, enroll 3,000 acres of cover crops, decommission 10 wells, and promote environmental awareness and land stewardship.

INNOVATIVE FEATURES

A significant emphasis of this project is the use of bio-engineering, such as log cribwalls. Log cribwalls are designed to provide a long-term, sustainable solution where native vegetation replaces structural elements as they degrade. When incorporated into the structure, tree species with high growth rates, extensive root systems, and the ability to withstand saturation and periodic flooding (such as willow and cottonwood) become living structural elements, adding soil stability, providing shade, and improving the water quality.

To promote bio-engineering into future projects, the SCWIG will work directly with County officials to ensure they are aware of the Geomorphic Assessment, the Plan, and the scientific and engineering recommendations that will benefit Shell Creek. Traditional approaches to bank stabilization have featured hard engineered structures, concrete, sheet pile, rip rap etc. New developments within the industry have indicated that vegetation can provide better and more sustainable results without the design life issues of engineered structures, as well as provide more beneficial aquatic habitat.

DESIGN OF PROJECT

With the planning process complete, the SCWIG and LPNNRD has worked with EA to identify locations where varying stream restoration solutions can be effectively installed. During the preliminary engineering phase the SCWIG, LPNNRD, and EA will work to create partnerships with private landowners to site project locations based upon general locations identified in the Plan. Below is a list of four structural practices, as well as a general discussion on Basin-wide BMPs, all of these practices have been identified in the Plan as effective tools to begin achieving the Plan's phase one goals.

Log Cribwall Stabilization

Bank stabilization has been recommended in the Plan in areas where critical public infrastructure is threatened by the widening of the creek. The SCWIG has opted to work with Counties to identify areas where stabilization is necessary and utilize bioengineering techniques such as log cribwalls. Cribwalls are a lattice-like structure of logs, placed both horizontally and vertically, with slash, local boulders, and soil intermixed within the log matrix. Cribwalls create aquatic habitat as well as stabilize stream banks. The Brewery Hill sub-watershed is as a priority location (Figure 1).

Task 1: Field Survey. A field survey will be performed to validate the location selected for construction of a log cribwall for bank stabilization. In addition, survey data such as cross sections and stream slope will be collected for use in hydrologic and hydraulic (H&H) modeling in the potential location.

Task 2: Hydrologic and Hydraulic Analysis: Hydrology will be developed to document design flows and base flood elevation. Methods will rely on existing models, USGS regression methodology, and other data to develop estimates for the 2, 10, 50, and 100 year floods. Hydraulic analysis will be accomplished using HEC-RAS and will include any nearby infrastructure (bridges). This

information will be used to develop shear analysis for materials design and determine localized inundation elevations.

Task 3: 50% Design: Design will be completed to a level to confirm the application, define quantities, develop a plan and typical section view, and an engineer's estimate for construction costs. The tasks in this phase will include:

- Design Plans (plan view and typical section); Construction Cost Estimate; Design Memorandum.

Task 4: Permitting. Permits necessary for construction of a log cribwall at a single location will be identified.

Bench Wetland Restoration

Using LiDAR, the Plan identified approximately 18 locations where the vertical distance between the existing channel and relict oxbows are less than 7 feet and deemed feasible to create a bench wetland. The intent is to use surface water hydrology from the stream's frequent high flow events to create wetlands. Benefits include flood storage, pollutant filtration, groundwater infiltration, aquatic habitat, and wildlife habitat. Potential locations for projects have been identified in Figure 1. This project will include property owner coordination and consultation to gain access and permission.

Task 1: Field Survey. A field survey will be performed to validate the location selected for construction of a bench wetland. In addition, survey data such as cross sections and stream slope will be collected for use in hydrologic and hydraulic modeling in the potential location.

Task 2: Hydrologic and Hydraulic Analysis: Hydrology will be developed to document design flows and base flood elevation. Methods will rely on existing models, USGS regression methodology and other data to develop estimates for the 2, 10, 50, and 100 year floods. Hydraulic analysis will be accomplished using HEC-RAS and will include any nearby infrastructure (bridges). This information will be used to develop shear analysis for materials design and determine localized inundation elevations.

Task 3: 50% Design: Design will be completed to a level to confirm the application, define quantities, develop a plan and typical section view, and an engineer's estimate for construction costs. The tasks in this phase will include:

- Design Plans – two sheets, a plan view and typical section; Design Cost – and engineer's estimate of construction cost; Design Memorandum – outline the results of the H&H analysis and document and site characteristics important to the design.

Task 4: Permitting. Permits necessary for construction of a bench wetland at a single location will be identified.

Shell Creek Tributary Stabilization

During the field assessment, several knickpoints (a place in a river, stream, or creek where its gradient changes and it begins to flow more steeply) were observed in the four major tributaries. Grade control is recommended in some of the tributaries where active knickpoints were observed, particularly in sections where sinuosity is low. Benefits include mitigation of active incision up through the tributary watersheds and as a result reduce sediment within the stream. Grade control riffles spaced at regular intervals may help curb areas of minor incision in sections of streams by changing their profile from an erosive, steep incline to a stable stair-step pattern with hardened beds at each step. These structures allow stream elevation to drop in a controlled setting, while preventing further degradation. The four tributaries that have been identified as potential locations for grade control are shown in Figure 1.

Task 1: Desktop Analysis: To support preliminary design, LiDAR, aerial photos, and profiles of the mainstems of the four major tributary systems will be used to identify site specific areas of vertical instability. Up to eight areas will be initially identified.

Task 2: Field Survey: A field survey will be performed to validate up to eight locations within the four major tributaries for grade stabilization. The field survey will include correspondence with landowners. In addition, survey data such as cross sections and stream slope will be collected for use in H&H modeling in the potential locations.

Task 2: Hydrologic and Hydraulic Analysis: Hydrology will be developed to document design flows and base flood elevation. Methods will rely on existing models, USGS regression methodology and other data to develop estimates for the 2, 10, 50, and 100 year floods. Hydraulic analysis will be accomplished using HEC-RAS and will include any nearby infrastructure (bridges). This information will be used to develop shear analysis for materials design and determine localized inundation elevations

Task 3: 50% Design: For the four of the eight most feasible, environmental beneficial, and cost effective sites, design will be completed to a level to confirm the application, define quantities, develop a plan and typical section view, and an engineer's estimate for construction costs. The tasks in this phase will include:

- Design Plans – two sheets, a plan view and typical section; Design Cost – and engineer's estimate of construction cost; Design Memorandum – outline the results of the H&H analysis and document and site characteristics important to the design.

Task 4: Permitting. Permits necessary for grade stabilization at up to four locations within the four major tributaries will be identified.

Re-Meandering

When Shell Creek incised, it lost connection to its floodplain, a surface that is typically inundated on a near annual basis. The floodplain serves as the transition between the fully aquatic stream habitat and the upland habitat, in this case prairie or agricultural land. Under current conditions, flood flows are often contained within the incised channel resulting in more erosive energy and perhaps limiting the establishment of native riparian vegetation.

Re-meandering requires excavation down to a new channel and floodplain. A channel and floodplain bench can be excavated at the existing bed elevations within the existing banks, thus increasing flood water capacity and re-creating a more natural floodplain. Additional benefits include increased aquatic habitat and wildlife habitat. The resulting channel and floodplain would resemble the future channel adjustment endpoint if left alone, especially in the downstream reaches.

LPNNRD has identified one area in the Brewery Hill sub-watershed (Figure 1) that is being considered for re-meandering in order to increase the conveyance of Shell Creek. LPNNRD is responsible for work completed on the re-meandering project.

Basin-Wide Management Practices

Soil and water conservation management practices and improving soil health remain a high priority of SCWIG and are a critical part of Plan implementation. SCWIG would offer cost-share and financial incentives to match with existing NRCS and LPNNRD programs. Within the Plan, five main management practices identified to reduce pollutant reduction and include cover crops, terraces, water quality structures (small ponds), onsite wastewater system upgrades, and well abandonment. As part of this project, SCWIG would still offer other traditional practices such as: no-till buffer strips; sediment basins and grade stabilization structures.

Education and outreach is considered part of the basin-wide practices including continuation of the educational component of SCWIG including a quarterly newsletter sent to 1,800 residents, support of the Newman Grove Science Team's water quality monitoring, and outreach directly with agricultural producers. In addition, SCWIG signage throughout the watershed will also be updated to advertise the new efforts.

MEASURES TO MAXIMIZE COST EFFECTIVENESS

Structural recommendations are a result of the Geomorphic Assessment that was completed during the establishment of the Plan in 2014. These recommendations are the result of a desktop and field assessment completed by professional engineers and fluvial geomorphologists. Conservation practices selected for implementation were based upon their capability to reduce nutrients, pesticides, and sediments from entering Shell Creek, as well as land user willingness to participate.

CONTRIBUTING PARTNERS

Lower Platte North Natural Resources District – grant administration, technical assistance, education and outreach, and financial contributor; Nebraska Department of Environmental Quality – technical assistance, funding, and education and outreach; Natural Resources Conservation Service – SCWIG coordinator, technical assistance, financial assistance, education and outreach; EA and Inter-fluve, Inc. – preliminary engineering, design, permitting, and property owner coordination.

SOCIAL, ECONOMIC, and PUBLIC BENEFITS

SCWIG has already made remarkable progress towards improving environmental stewardship and water quality in Shell Creek and a new set of tools are available with development of the new plan. With improved water quality comes an improved aquatic habitat, thus the re-introduction of game fish such as channel catfish. The public will benefit with the opportunity for youth to fish channel catfish in Shell Creek. With implementation of the new Plan, this opportunity will only become stronger.

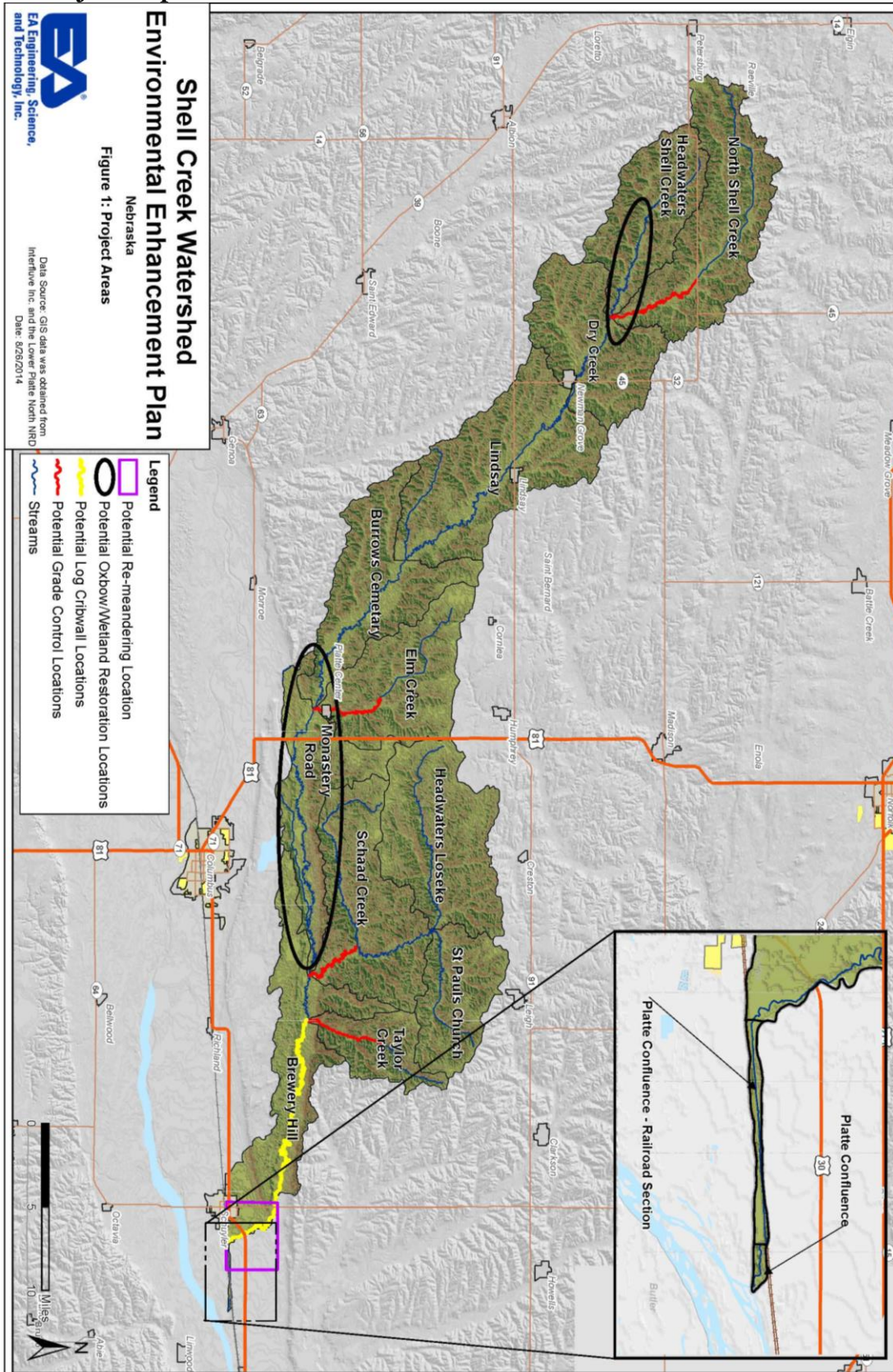
MAINTENANCE and EVALUATION

LPNNRD has an ongoing partnership with SCWIG and will be responsible for assisting with maintenance needs. Also, SCWIG will approach each area county as a working partner, potentially including construction and maintenance responsibilities in the future. The project's success will be evaluated by quantifying the increase in functional wetlands, measuring the number of conservation management practices, and post-project visual assessments to evaluate the structural performance. Project evaluation and success will serve as a basis for replicating practices to other priority areas in the future.

LIST OF FEDERAL/STATE PERMITS OR APPROVALS

Nebraska Game and Parks Commission and U.S. Fish and Wildlife Service - endangered or threatened species consultation; Nebraska State Historical Society - historical, cultural, or social resources consultation; U.S. Army Corps of Engineers – 404 permitting; and NDEQ and EPA - Section 319 Nonpoint Source Program Project Implementation Plan approval.

12. Project Map



August 28, 2014

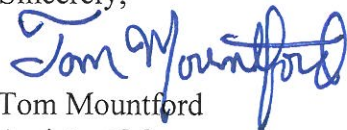
Mark A. Brohman, Executive Director
Nebraska Environmental Trust Fund
P.O. Box 94913
Lincoln, NE 68509-4913

Mr. Brohman,

As a supporting partner on the Shell Creek Environmental Enhancement Plan Implementation Project, the Lower Platte North Natural Resources District has committed \$100,000 to be used as local match for identified Best Management Practices. The project builds on many years of partnership planning and accomplishment to improve water quality and enhance all natural resources in the Shell Creek Watershed.

This is a shining example how local, state and federal partners can come together to protect and enhance soil and water resources by combining established and innovative projects. It is a major step toward reducing the amount of sediment and nutrients that normally flow into Shell Creek during intense rainfall events, thus improving the quality of life for all its inhabitants.

Sincerely,



Tom Mountford
Assistant Manager
Lower Platte North NRD

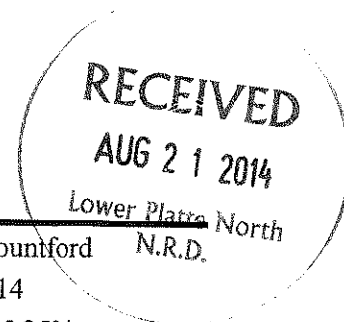


EA Engineering, Science,
and Technology, Inc.

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Lincoln, NE 68528
Telephone: 402.476.3766
Fax: 402.476.7825
www.eaest.com

**INVOICE ATTACHED
PROGRESS REPORT & INVOICE**

Shell Creek Watershed Water Quality Management Plan



EA Project Number:	6276501	LPN NRD Project Contact:	Tom Mountford
EA Project Manager:	Dan Bigbee	Date Prepared:	8/12/2014
Time Period:	7/1/2014 through 7/31/2014	Percent Complete:	95.25%

This progress report describes the project effort for the above time period and may include a summary of any work completed or anticipated for all work listed in the scope of services.

Work Completed This Period:

- Continued preparation of the management plan up to a 90% level.
- Received and reviewed the Geomorphic Assessment and distributed a draft version of the report to SCWIG, LPN NRD, and NDEQ.
- Prepared for and facilitated the steering committee meeting on July 24th to discuss watershed and stream improvement strategies, as well as the Geomorphic Assessment.
- Scheduled final Open House for September 18, 2014.
- The steering committee voted to apply for a Nebraska Environmental Trust Grant and 319 Grant to begin implementation of the plan. EA will work with the LPN NRD to prepare the grant applications as a separate project.

Deliverables Completed this Reporting Period

- Shell Creek Geomorphic Assessment - Draft

Issues/Resolution

- None

Work Projected Next Reporting Period (August 2014)

- Submit full Draft Plan hard copied to NDEQ for review.
- Assist LPN NRD and SCWIG with preparation of a press release for an article in Nebraska Farmer magazine.
- Assist with development of a flyer to advertise the Open House.

Schedule

- Project is on schedule and the draft plan is anticipated to be ready by 29 August 2014. NDEQ acceptance of the plan is on schedule for October 2014.



EA Engineering, Science, and Technology, Inc.

221 Sun Valley Boulevard
Suite D
Lincoln, NE 68528-1576
Phone: 402-476-3766

Federal ID: 52-0991911

Attn: Tom Mountford
Lower Platte North NRD
511 Commercial Park Road
Box 126
Wahoo, NE 68006

Invoice Date : 08/20/2014
Invoice # : 89841
EA Project # : 6276501
Terms : Due upon Receipt
Remit payment to : PO Box 23865
Baltimore, MD 21203-5865

EA Project Manager : BIGBEE, DANIEL L.

For Professional Services Rendered through: 7/31/2014

Shell Creek Watershed Water Quality Plan

Total Project Fee Authorized	123,000.00
Percent Complete as of 7/31/2014	95.25
Fee Earned To Date	117,157.50
Less Previous Billings	86,100.00
Amount Due this Invoice	31,057.50

Date rec'd 8/21/14

Approved by JM

Date approved 8/21/14

Expense acct _____

Funding source _____

% (amount) _____

Income acct _____

Interest charges accrue at 1.5% per month for balances over 30 days.
(Contractual agreements supercede standard EA billing terms).

For payments via ACH/Wire: Wachovia Bank, EA Engineering, Science & Technology, Acct Number: 2000020354035, Routing #: 055003201, Reference: Lockbox 23865
For payments via Overnight: Wachovia Bank, EA Engineering, Science & Technology, Lockbox 23865, 7175 Columbia Gateway Drive, Columbia, MD 21046



**Lower Platte River
CORRIDOR ALLIANCE**

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3125 Portia St.
PO Box 83581
Lincoln, NE 68501-3581

p: 402.476.2729
f: 402.476.6454

www.lowerplatte.org

Monthly Report for July 2014

Meghan Sittler, Coordinator

River Obstruction Removal

The plans to submit an RTP grant to help cover the costs of the removal along with river access at Two Rivers continue to move ahead. The grant will be submitted in early September (deadline September 5th). The LPRCA, with Olsson Associates, had been exploring some potential cost savings for the removal of the obstructions. Decreasing the depth of removal was an option that would have resulted in some cost-savings during construction. However, after discussions with the NRDs it was decided that was not a preferred option and would not keep with the merit of the project to improve safety and flood control for the long term. Olsson Associates is preparing an opinion of costs for the removal and boat access point. The RTP grant is being developed in partnership with the Nebraska Game and Parks Commission.

Watershed Management Plan

HDR was finishing up some final graphics at the end of July with delivery of the final draft being made to the LPRCA on August 1st. The draft will be sent to NDEQ for their review and can be found on the LPRCA website. I am currently working on 3 grants related to the implementation of the watershed management plan. The first is a 319 application to implement the voluntary septic tank upgrade program, expanded education and outreach, and implementation planning for our priority 1 watersheds. I am working with the Nebraska Watershed Network on collaborating on the education and outreach portion of this grant. The remaining two grants are a 319 and Nebraska Environmental Trust grant being developed in partnership with NARD. The 319 grant will develop a BMP effectiveness database for the 20 most utilized BMPs in Nebraska. The NET grant will develop a web based tool with GIS applications that will allow users to identify and evaluate placement and effectiveness of BMPs to reduce pollutant loads down to the field level. All three of the grants are due on September 2nd.

Recreation Planning Study

The Corps of Engineers began development of the preliminary economic analysis of recreation in the lower Platte River Corridor in July. The planning study was originally slated to be completed by the end of September but that date has slipped to closer to the end of the calendar year.

At the end of July the LPRCA submitted a grant to the National Park Service Rivers, Trails, and Conservation Assistance program. If the grant is received, NPS personnel will provide technical assistance to the LPRCA to begin to implement the recreation planning study. The RTCA program also helps identify funding sources and partners. We were notified that we had been advanced as the Midwest regional priority so we hope that we will hear good news from NPS soon!

LPRCA Events

The **Water Quality Open** is planned for Thursday, August 28th at Quarry Oaks. The keynote presentation is planned for 10:00 a.m. with golf beginning at noon. Dr. Carrick Detweiller of the University of Nebraska-Lincoln Computer Science and Engineering Department will provide this year's keynote presentation. Dr. Detweiller is leading an initiative to utilize aerial robotic technology within water sensing and sampling. Registration opens on July 10th and will be available via mail or on-line at http://www.lowerplatte.org/what_we_do/events/water_quality_open.html.

The **LPRCA Summit** is set for November 6 at Camp Carol Joy Holling near Ashland. Dave Sands of the Nebraska Land Trust, Matt Pillard of HDR and Rachael Herpel of the Rural Futures Institute and Water For Food Institute at UNL have graciously agreed to serve on the steering committee for the event this year. Chuck Schroeder, the Director of the Rural Futures Institute will be the opening speaker for the day. We plan to focus the Summit on challenges and opportunities at the rural-urban interface with particular attention to rural innovation as well as how the work of the LPRCA and our partners can assist communities, counties and individuals in meeting those challenges and seeking opportunities. More information on the event will be available very soon and will be discussed at the LPRCA Quarterly meeting. We would love to hear your ideas.

Upcoming Events:

LPRCA Water Quality Open: August 28, Quarry Oaks

LPRCA Kayak Tour Rain Date: September 17th (Registration full)

NARD Fall Conference: September 28-30, Kearney

Water for Food Symposium: October 19-22, Seattle

Lower Platte River Summit: November 6, Camp Carol Joy Holling, Ashland