

Project Implementation Plan

Long Pine Creek Watershed Implementation Phase 1

Project Sponsor

Middle Niobrara Natural Resource District
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Project Partners

Nebraska Department of Environmental Quality:
Provide funding and technical assistance for plan development.

Natural Resource Conservation Service:
Provide cost share for BMP implementation through various programs.

Nebraska Environmental Trust:
The Nebraska Environmental Trust will provide funding and for watershed plan implementation efforts.

Ainsworth Irrigation District (AID):
The AID will provide cost share for BMP implementation, and stakeholder input.

Project Area

This project focuses on implementation in the highest priority (Phase 1) areas identified in the Long Pine Creek Watershed Management Plan. A project area map is included at the end of this PIP for reference.

Funding

Section 319 Funds:	\$97,500
Other Federal Funds:	\$100,000
Non-federal Funds:	\$370,000
Project Total:	\$567,500

Project Duration:

May 1, 2016 – March 30, 2018

Introduction and Background

The Long Pine Creek Watershed consists of about 520 square miles located in the Nebraska Sandhills. The watershed encompasses thirteen (13) HUC 12 sub-watersheds and several waterbodies on the NDEQ's Section 303(d) list of impaired waters. Long Pine creek itself is listed as a Category 5 impaired waterbody due to *E. Coli* bacteria.

In November, 2012, Middle Niobrara Natural Resources District (MNNRD) began the development of the Long Pine Creek Watershed Quality Management Plan (WQMP) and the associated Sand Draw Creek Stream Restoration Plan. In the WQMP, JEO evaluated 13 sub-watersheds (520 square miles) to identify and prioritize management actions - in-stream and upland conservation practices to address water quality and aquatic habitat issues throughout the watershed. Four of the HUC 12 watersheds were identified as high priority areas for implementation, including: Sand Draw, Middle Bone Creek, Willow Creek, Middle Long Pine Creek, and adjacent areas within the Ainsworth Irrigation District (hereinafter referred to as priority "sub-basin or "sub-watersheds"). The watershed plan was approved through EPA review in March 2016.

The Middle Niobrara NRD submitted a successful grant application to the NDEQ to begin implementation of the practices identified in WQMP in the priority sub-basins. This project implementation plan outlines the first phase of implementation of the WQMP in the Long Pine Creek Watershed

Project Description

The scope of this project includes three primary goals: the design and permitting of several stream stabilization structures, increasing adoption and implementation of conservation practices in the priority sub-watersheds, and hiring of a watershed coordinator to improve the outcomes of other tasks by conducting landowner outreach and public education.

The Middle Niobrara NRD has contracted with JEO Consulting Group, Inc. (JEO) to conduct the design and permitting process for several in-stream stabilization structures that were identified in the Long Pine Creek Watershed management plan. It is anticipated that these structures will be built during subsequent project phases, and as funding allows. In addition to design and engineering services, the NRD will work with landowners and producers to implement additional conservation practices within the high priority sub-watersheds.

The Middle Niobrara NRD will hire and retain a watershed coordinator. The coordinator will educate landowners on the non-point source issues within the Long Pine Creek, and promote the adoption of conservation practices within the watershed. Greater focus will be placed on priority areas, but limited outreach will be conducted throughout the watershed as appropriate.

Project Goals and Objectives

Goal 1: Implementation of conservation practices consistent with the recommendations of the Long Pine Creek WQMP will be designed and permitted in the targeted sub-watersheds. Design will be based on best engineering practices and will address land use and stream conditions that contribute to the pollution and impairment of surface water, groundwater, and aquatic habitat.

Objective 1: Six to Eight (6 to 8) grade control structures at two priority sites will be designed for areas of Sand Draw Creek.

Task 1.1: Field Visit and Field Survey:

A full topographic survey of the two priority sites will be conducted in order to complete the design of 6 to 8 grade control structures. These structures will mitigate areas of significant incision identified in the Sand Draw Creek priority subwatershed. Information gathered will include channel bank lines, top and toe of slopes, and any other relevant information required to properly design and construct the projects. A sufficient number of benchmarks and control points will also be established. LiDAR data may be used to supplement field survey data if required.

Task 1.2: Hydrology and Hydraulics (H & H) Analysis:

H&H conditions will be analyzed at each proposed grade control locations in order to best design stabilization features. It is anticipated that a steady flow HEC RAS model will be created at the project locations for a range of flow conditions.

Task 1.3: Preliminary 50% Design Plans, Design Review Meeting and Plan-in Hand:

Based on concept plans from the “Lower Reach Sand Draw Creek Restoration plan”, the kickoff meeting, the topo survey, and H&H analysis, a preliminary set of plans will be created for the 6 to 8 sites. Upon completion of the preliminary design plans, a meeting will be held with project sponsors and key stakeholders to review the project design alternatives, potential costs, potential ROW/easements.

Task 1.4: Final Draft 90% Design Plans & Specifications:

Comments received from the preliminary design review will be addressed and a final draft set of plans and specifications will be developed. Prior to finalizing the plans, a final draft review and plan-in-hand site visit will be held.

Task 1.5: Finalize Design Plans and Specifications:

Any minor revisions resulting from the final draft review will be incorporated into a set of final plans and specifications.

Objective 2: The NRD will assist in the permitting of Grade Control and Stream Restoration Structures

Task 2.1: Identify Required Permits:

Necessary permits will be identified and obtained in order to prepare for construction of the above designed restoration sites. Potential permits include: Army Corps of Engineers 404 Permit, NPDES / SWPPP, and Floodplain. It is anticipated that a Nationwide 404 Permit will be applicable and obtained for each site.

Task 2.2: Wetland Delineation and 404 Permit Submittal:

A wetland delineation will be conducted for the stream restoration sites utilizing the methodology in the US Army Corps of Engineers Wetland Delineation Manual and Regional Supplemental Delineation Manual. Areas meeting the definition of wetlands will be mapped, and included in a written report. Impacts to wetland or Waters of the US, will be identified in a 404 application packet and submitted to the USACE for permit verification.

Goal 2: Provide technical assistance, information, and education to landowners and stakeholders in high priority sub-watersheds identified in the WQMP.

Objective 1: The NRD will Provide technical assistance to landowners in the high priority watersheds.

Task 1.1: Hire or Retain a Watershed Coordinator

The watershed coordinator will assist the landowners and partners in evaluating, designing, and installing BMPs on their land. The coordinator will be housed within the Long Pine Creek watershed, in order to work closely with landowners and project partners. In addition to technical assistance, the coordinator will assist the MNDRD staff in focusing its outreach and education/information activities within the watershed and submitting required progress reports for project partners.

Objective 2: The NRD and the Watershed Coordinator Will Provide focused information and education outreach within high priority watersheds.

Task 2.1: Maintain the Advisory and Stakeholder Committee

Continue to work with the advisory/stakeholder committee created during the development of the Long Pine Creek Watershed Plan to ensure that project goals and objectives are being completed in a timely manner, and to assist in adapting management strategies based on stakeholder and public feedback.

Task 2.2: Educate Stakeholders, the Public, and Special Audiences

Information and Educational materials will be developed and distributed throughout the targeted sub-watersheds to inform stakeholders about cost share opportunities, and the environmental benefits achieved through implementation of the identified BMPs. These materials may include educational brochures, informational flyers, as well as press releases and project updates through the NRD newsletter and/or website. Specific emphasis will be placed on engaging specific demographics and/or businesses including women, youth, urban residents, business owners, and agricultural advisors and suppliers.

Goal 3: Begin installation of conservation practices in the targeted sub-watersheds to restore and protect water quality, as identified in the watershed plan.

Objective 1: The NRD and project partners will provide cost share and increase adoption of conservation practices identified in the WQMP on agricultural land.

Task 1.1: Implement 4 conservation practices on 800 acres of agricultural land.

Task 1.2: Install fencing or stream bank stabilization structures to protect 3 miles of stream bank.

Task 1.3: Improve irrigation practices on 6000 acres

Objective 2: The NRD and project partners will provide cost share for implementation of BMPs in urban/residential areas

Task 2.1: Install 10 demonstrations of urban best management practices.

Task 2.2: Implement 8 structural practices on homeowner property.

Pollutant Sources

The WQMP for Long Pine Creek identified multiple impaired water bodies throughout the watershed, both Bone Creek and Long Pine Creek have high levels of bacteria (*E. coli*) above the state water quality standards. Though Sand Draw Creek is currently not impaired for bacteria due to lack of sampling data, visual inspections indicate severe stream bank and bed erosion throughout the reach, and in several areas grazing livestock are allowed to freely access the stream corridor. Loading estimates in the WQMP indicate that portions of *E. Coli* loadings originate from the Sand Draw Creek watershed. Implementation of conservation practices within these sub-watersheds will reduce downstream concentrations in the impaired reach of Long Pine Creek directly downstream.

In addition to bacteria, additional pollutants of concern are nutrients (phosphorous and nitrogen) and sediment. Nutrient contamination from pasture runoff, urban storm water run-off, and natural sources all contribute to nutrient contributions in lakes, rivers, and groundwater. Nutrients such as phosphorus and nitrogen enter the waterways through sewage, livestock, and fertilizer runoff. Additionally, phosphorus is often tied to sediment and loads are increased through erosion. Sediment is a primary contributor to impaired water quality, particularly from upland and streambank erosion.

The primary source of sediment from the uplands comes from pasture land. However, in sub watersheds dominated by row crops, cropland was the primary contributor. Excess sediment load degrades water clarity (commonly called turbidity) which is both harmful to aquatic habitat and aesthetically undesirable. Within the watershed several non-point sources have been identified to cause of *E. coli* contamination. Non-point sources include run-off from urban storm water systems, livestock pastures, land application of manure, pet waste, and natural sources (wildlife).

Pollutant Load Reductions

The Watershed Plan utilized water quality modeling to provide a preliminary understanding of the effectiveness of specific structural and non-structural BMPs on reducing sediment and nutrient loads. Estimates of *E. coli* reductions due to management practices were based on results found through literature review.

Reduction to pollutant loads may vary considerably based upon the final location, treated area, and design of BMPs, however, the table below gives a reasonable expectation of reductions due to BMP implementation as a part of this project. These reduction numbers are based on pollutant load reductions calculated in the WQMP and for the anticipated conservation practices to be installed (as identified below).

Subwatershed	Estimated Load Reductions			
	Total Nitrogen Lbs./Year	Bacteria (<i>E. coli</i>) (CFU/100ml)	Phosphorus (Lbs./Year)	Sediment (Tons/Year)
Sand Draw	6,003	2	1,104	259
Middle Bone Creek	6,705	1	1,574	495
Lower Bone Draw	2,008	1	582	217
Lower Long Pine Creek	683	1	148	14
Total	15,400	5	3,408	685

After project implementation completes, specific locations and numbers of conservation practices implemented will be quantified. This information will be used to refine these loading reduction estimates in the final report and future watershed plan updates.

Conservation Practices

Improving the water quality within Long Pine Creek Watershed will take a variety of BMPs, management practices, and water quality improvement projects. This project will focus on the following priority BMPs in the high priority sub watersheds. In order to remain flexible, and to assist landowners in adopting conservation practices this should not be considered a comprehensive list. Other BMPs identified in the Watershed Management Plan may be implemented so long as they have been proven effective at reducing the non-point source pollutants of concern.

The following table outlines the conservation practices which are most likely to be implemented as part of this Phase 1 Project. These practices are consistent with the recommendations in the watershed management plan.

Conservation Practices	Unit	Cost/Unit	# of Units	# of years	Sub-totals
Stream Bank Stabilization	LF	\$10	8000	1	\$80,000
Cover Crop	Acre	\$90	160	3	\$43,200
Fence	LF	\$2	8000	1	\$16,000
Grassed waterways	Acre	\$3,120	10	1	\$31,200
Irrigation Water Management	Each	\$2,245	60	1	\$134,700
No till	Acre	\$20	200	1	\$4,000
Grade Stabilization Structures	CY	\$5	1250	1	\$6,250
Rain Gardens/Swale/Urban other	Each	\$1,000	10	1	\$10,000
Well Decommissioning	Each	\$500	6	1	\$3,000
Composting/Chips/Manure	SF	\$12	10000	1	\$120,000
Mulching	Acre	\$700	75	1	\$52,500
Other BMP's to be Determined	NA	\$10,750	1	1	\$10,750
Total					\$521,600

Communication

Communication began during the development of the Watershed Management Plan, which brought together a stakeholder group through a series of meetings and the public through an open house and a public survey. The success of this Phase will hinge upon public outreach, continued stakeholder participation, and landowner participation. The implemented BMPs will only be constructed through willing landowners. Coordinated outreach to landowners in the project area will be conducted by the stakeholders and watershed coordinator, and it is anticipated that 2-3 stakeholder meetings or open houses will be held throughout the implementation phase.

The WQMP and Stream Restoration Plan were conducted in a way to gather input on the values and general concerns of residents and stakeholders within the Watershed. Information and education will continue to play a crucial role in the ongoing implementation of the plan. Public input efforts during the development of the watershed plan have given stakeholders an understanding of the types and sources pollution, the management solutions needed to improve and maintain good water quality, and the strategy for implementing the watershed plan. Ongoing information and education activities for priority sub-watershed areas, project identification and implementation, and partnerships will be conducted at more detailed level during this Phase.

The watershed coordinator will be responsible for maintaining a strong public presence and fostering continued public outreach and involvement. Specific outreach efforts will include: site visits, watershed tours, peer-to-peer outreach, meetings and workshops, media releases, "stream assessment" or clean-up days through local schools/groups, adopt-a-stream program, informational brochures, school poster contests, news/information articles and interviews, utility bill stuffers, and website or other web based/social media venues.

Monitoring and Evaluation Criteria

The MNNRD currently implements several water management programs to protect and conserve the waterbodies within the Long Pine Creek Watershed and subwatersheds. These programs aim to address groundwater quality and quantity issues. Water Quality programs currently offered by the MNNRD include: Ambient Water Sample Collection, Nitrate Sampling, Chemigation, Static Water Levels, and Nebraska Rainfall Assessment and Information Network (NeRAIN). A full description of each program can be found on the MNNRD website. Additional water quality monitoring information will be provided by NDEQ through its long-term water quality monitoring program, which rotates through Nebraska's major stream basins. Short-term monitoring/effectiveness evaluation will be provided through tracking of BMP installation and estimates or modeling of the effectiveness of those on water quality improvements.

The effectiveness of the planned project will be evaluated on an on-going basis throughout the project, and in subsequent phases.

- Estimated pollutant load reductions for sediment, nutrients, and bacteria that reach subwatershed streams, and ultimately, the Long Pine Creek Watershed will be quantified based on reduction estimates for BMPs that are implemented.
- Increased producer and landowner adoption or participation of conservation practice programs
- Heightened awareness, education, and communication of sub-basin stakeholders about effective management practices that will contribute to long-term water quality improvements.
- Completed designs for the stabilization of the lower reaches of Sand Draw Creek will be complete and ready for construction phases

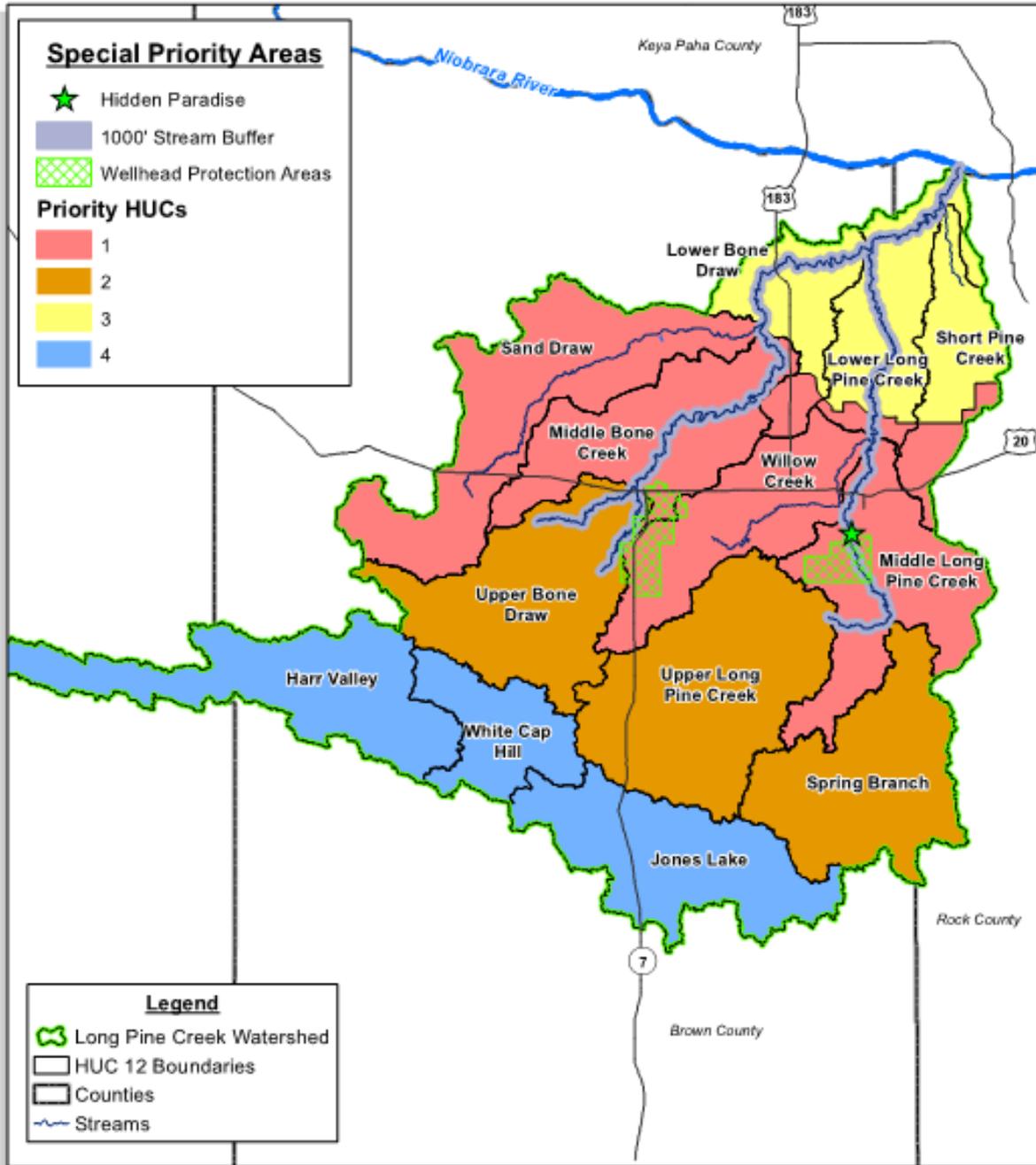
Project Milestones

Milestone	Date
Approvals and Contracts in Place	May 2016
Survey Completed	May 2016
Hire or Retain Watershed Coordinator	June 2016
Preliminary Design Completed	August 2016
404 Permit Submitted	November 2016
Final Plans Completed	February 2017
404 Permit Approved	April 2017
BMP Implementation Begins	April 2017
BMP Implementation Concludes	May 2018
Project Final Report	May 2018

Budget

Budget Category	Federal Funds		Non Federal Funds			Total
	Section 319	EQIP	Nebraska Environmental Trust	Middle Niobrara NRD	Ainsworth Irrigation District	
Personnel						
Watershed Coordinator	\$10,000	--	\$45,500	--	--	\$55,400
Admin/Staff	--	-	--	\$40,000	--	\$40,000
Materials & Supplies						
Meeting Supplies and Outreach Materials	\$500	--	\$1,600	--	--	\$2,100
Contractual						
Design and Permitting of Stream Stabilization Structures (Engineering)	\$62,000	--	\$113,000	--	--	\$175,000
BMP Implementation (Cost-share)	\$25,000	\$100,000	\$90,000	\$60,000	\$20,000	\$295,100
Total	\$97,500	\$100,000	\$250,000	\$100,000	\$20,000	\$567,500

Project Area Map (Priority Sub-Basins are in RED):



0 3 6 Miles

**Long Pine Creek Watershed
Water Quality Management Plan**

Created By: ADR
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Figure 40: Priority Subwatersheds and Special Priority Areas