Final

Watershed Plan-
Environmental Assessment

Bone and Long Pine Creeks Watershed
Improvement Project
Brown, Cherry, and Rock Counties, NE

February 2024

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WATERSHED PLAN & ENVIRONMENTAL ASSESSMENT

For

Bone and Long Pine Creeks Watershed

Brown, Cherry, and Rock Counties, NE

AUTHORITY

This watershed work plan has been prepared under the authority of the Watershed Protection and Flood Prevention Act of 1954 (Public Law 83-566) as amended. The construction of this Project is authorized under Public Law 83-566 (as amended) and in accordance with Section 102(2) of the National Environmental Policy Act of 1969, Public Law 91-190, as amended (42 U.S.C. 4321 et seq.).

ABSTRACT

This document is intended to fulfill requirements of the National Environmental Policy Act and to be considered for authorization of Public Law 566 funding. This purpose of the proposed action is to provide watershed protection through onsite treatment of watershed natural resources to provide grade control, bank stabilization, and aquatic ecosystem restoration and rehabilitation within the Bone and Long Pine Creeks Watershed. This document intends to serve as both a site-specific and programmatic Plan-EA. The preferred alternative is made up of projects which are divided into Tier 1 and Tier 2 project phases based on implementation timing. Specific high priority locations have been identified through the scoping process and interagency and landowner coordination and are included as Tier 1 projects. Other locations have been identified and ranked through the scoping process as Tier 2 projects, with design and site-specific environmental evaluations (EEs) to be completed in the future. The preferred alternative includes thirty-six (36) structures/practices along eleven (11) stream reaches on Bone Creek, Sand Draw Creek, and Willow Creek within the Tier 1 phase. Grade stabilization and stream crossing structures were chosen with special consideration to aquatic organism passage and improved aquatic habitat. Total estimated project costs for the Tier 1 phase of the preferred alternative are $7,144,400, of which $5,493,700 is proposed to be paid by Public Law 566 funds. The Tier 2 phase includes eleven (11) project locations, and eleven (11) stream reaches along Bone Creek, Sand Draw Creek, Willow Creek, and Long Pine Creek as well as 8 additional projects/structures located in the uplands. Total estimated project costs for the Tier 2 phase of the preferred alternative are $9,790,900, of which $7,638,700 is proposed to be paid by Public Law 566 funds.

Responsible Agency:	U.S. Department of Agriculture, Natural Resources Conservation Service
Sponsor:	Middle Niobrara Natural Resources District
Cooperating Agency:	United States Corps of Engineers

COMMENTS AND INQUIRIES

Comments and inquires must be received by March 22, 2024. Submit comments and inquiries to:

Melissa Baier, ASTC-Water Resources & Easements
Natural Resources Conservation Service
Federal Building, Room 343
100 Centennial Mall North
Lincoln, Nebraska 68508

Non-Discrimination Statement

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the responsible Agency or USDA's TARGET Center at (202) 720-2600 (voice and TTY) or contact USDA through the Federal Relay Service at (800) 877-8339. Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at https://www.usda.gov/oascr/how-to-file-a-program-discrimination-complaint and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

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Watershed Agreement

for Bone and Long Pine Creeks Watershed

between the
Middle Niobrara Natural Resources District
(Referred to herein as Sponsor or SLO)
and the
Natural Resources Conservation Service,
United States Department of Agriculture
(Referred to herein as NRCS)

Whereas, application has heretofore been made to the Secretary of Agriculture by the sponsors for assistance in preparing a plan for works of improvement for the Bone and Long Pine Creek Watersheds, State of Nebraska, under the authority of the Watershed Protection and Flood Prevention Act, as amended (16 U.S.C. Sections 1001 to 1008, 1010, and 1012); and

Whereas, the responsibility for administration of the Watershed Protection and Flood Prevention Act, as amended (16 U.S.C. 1001 to 1008, 1010, and 1012), has been assigned by the Secretary of Agriculture to NRCS; and

Whereas, there has been developed through the cooperative efforts of the sponsors and NRCS a watershed project plan and environmental assessment for works of improvement for the Bone and Long Pine Creeks Watershed, State of Nebraska, hereinafter referred to as the watershed project plan or plan, which plan is annexed to and made a part of this agreement;

Now, therefore, in view of the foregoing considerations, the Secretary of Agriculture, through NRCS, and the sponsors hereby agree on this watershed project plan and that the works of improvement for this project will be installed, operated, and maintained in accordance with the terms, conditions, and stipulations provided for in this plan and including the following:

1. Term. The term of this agreement is for the installation period and evaluated life of the project (29 years) and does not commit NRCS to assistance of any kind beyond the end of the evaluated life.

2. Costs. The costs shown in this plan are preliminary estimates. Final costs to be borne by the parties hereto will be the actual costs incurred in the installation of works of improvement.

3. Real Property. The sponsors will acquire such real property as will be needed in connection with the works of improvement. The amounts and percentages of the real property acquisition costs to be borne by the sponsors and NRCS are as shown in the cost-share table in section 5 hereof.

4. Uniform Relocation Assistance and Real Property Acquisition Policies Act. The sponsors hereby agree to comply with all of the policies and procedures of the Uniform Relocation Assistance and Real Property Acquisition Policies Act (42 U.S.C. Section 4601 et seq. as further implemented through regulations in 49 CFR Part 24 and 7 CFR Part 21) when acquiring real property interests for this federally assisted project. If the sponsor is legally unable to comply with the real property acquisition requirements, it agrees that, before any Federal financial assistance is furnished, it will provide a statement to that effect, supported by an opinion of the chief legal officer of the state containing a full discussion of the facts and law involved. This statement may be accepted as constituting compliance.

5. Cost-share for Watershed Project Plans. The following table will be used to show cost-share percentages and amounts for watershed project plan implementation.

Distribution of Total Project Costs, Installation of Preferred Alternative (Tier 1 Phase)

Works of Improvement	NRCS		Sponsor		Total
Cost-Sharable Items	Percent	Cost	Percent	Cost	Cost
Watershed Protection Measures[1]	75%	$ 3,630,400	25%	$ 1,239,700	$ 4,870,100
Engineering	100%	$ 1,694,200	N/A	$ -	$ 1,694,200
Subtotal: Cost-Share		$ 5,324,600		$ 1,239,700	$ 6,564,300
Non-Cost-Shareable Items[2]					
Project Administration[3]	N/A	$ 169,100	N/A	$ 169,100	$ 338,200
Permits[4]	0	0	100%	$ 241,900	$ 241,900
Real Property Rights[4]	0	0	100%	$ -	$ -
Subtotal: Non-Cost-Share Costs		$ 169,100		$ 411,000	$ 580,100
Total:		**$ 5,493,700**		**$ 1,650,700**	**$ 7,144,400**

1/ The cost-share rate is the percentage of the average cost of installing the practice in the selected plan for the evaluation unit. During project implementation, the actual cost-share rate must not exceed the rate of assistance for similar practices and measures under existing national programs.

2/ If actual non-cost-sharable item expenditures vary from these figures, the responsible party will bear the change.

3/ The sponsors and NRCS will each bear the costs of project administration that each incurs. Sponsor costs for project administration include relocation assistance advisory service.

4/ The sponsors will acquire with other than Watershed Protection and Flood Prevention Act funds, such real property as will be needed in connection with the works of improvement. The value of real property is eligible as in-kind contributions toward the sponsors' share of the works of improvement costs. In no case will the amount of an in-kind contribution exceed the sponsors' share of the cost for the works of improvement. The maximum cost eligible for in-kind credit is the same as that for cost sharing.

Distribution of Total Project Costs, Installation of Preferred Alternative (Tier 2 Phase – Priority 1 and 2)

Works of Improvement	NRCS		Sponsor		Total
Cost-Sharable Items	Percent	Cost	Percent	Cost	Cost
Watershed Protection Measures[1]	75%	$ 4,834,300	25%	$ 1,611,200	$ 6,445,500
Sponsors Engineering Costs	100%	$ 2,578,500	N/A	$ -	$ 2,578,500
Subtotal: Cost-Share		$ 7,412,800		$ 1,611,200	$ 9,024,000
Non-Cost-Shareable Items[2]					
Project Administration[3]	N/A	$ 225,900	N/A	$ 225,900	$ 451,800
Permits[4]	0	0	100%	$ 315,100	$ 315,100
Real Property Rights[4]	0	0	100%	$ -	$ -
Subtotal: Non-Cost-Share Costs		$ 225,900		$ 541,000	$ 766,900
Total:		**$ 7,638,700**		**$ 2,152,200**	**$ 9,790,900**

1/ The cost-share rate is the percentage of the average cost of installing the practice in the selected plan for the evaluation unit. During project implementation, the actual cost-share rate must not exceed the rate of assistance for similar practices and measures under existing national programs.

2/ If actual non-cost-sharable item expenditures vary from these figures, the responsible party will bear the change.

3/ The sponsors and NRCS will each bear the costs of project administration that each incurs. Sponsor costs for project administration include relocation assistance advisory service.
4/ The sponsors will acquire with other than Watershed Protection and Flood Prevention Act funds, such real property as will be needed in connection with the works of improvement. The value of real property is eligible as in-kind contributions toward the sponsors' share of the works of improvement costs. In no case will the amount of an in-kind contribution exceed the sponsors' share of the cost for the works of improvement. The maximum cost eligible for in-kind credit is the same as that for cost sharing.

6. Land Treatment Agreements. The sponsors will ensure that 50 percent of the land upstream of any retention reservoir site is adequately protected before construction of the dam. The sponsors will provide assistance to landowners and operators to ensure the installation of the land treatment measures shown in the watershed project plan. The sponsors will encourage landowners and operators to continue to operate and maintain the land treatment measures after the long-term contracts expire, for the protection and improvement of the watershed.

7. Floodplain Management. Before construction of any project for flood prevention, the sponsors must agree to participate in and comply with applicable Federal floodplain management and flood insurance programs. For plans approved as of the date of this revised manual the sponsor is required to have development controls in place below low and significant hazard dams prior to NRCS or the sponsor entering into a construction contract.

8. Water and Mineral Rights. The sponsors will acquire or provide assurance that landowners or resource users have acquired such water, mineral, or other natural resources rights pursuant to State law as may be needed in the installation and operation of the works of improvement.

9. Permits. The sponsors will obtain and bear the cost for all necessary Federal, State, and local permits or consultations required by law, ordinance, or regulation for installation of the works of improvement.

10. NRCS Assistance. This agreement is not a fund-obligating document. Financial and other assistance to be furnished by NRCS in carrying out the plan is contingent upon the fulfillment of applicable laws and regulations and the availability of appropriations for this purpose.

11. Additional Agreements. A separate agreement will be entered into between NRCS and the sponsors before either party initiates work involving funds of the other party. Such agreements will set forth in detail the financial and working arrangements and other conditions that are applicable to the specific works of improvement.

12. Amendments. This plan may be amended or revised only by mutual agreement of the parties hereto, except that NRCS may deauthorize or terminate funding at any time it determines that the sponsors have failed to comply with the conditions of this agreement or when the program funding or authority expires. In this case, NRCS must promptly notify the sponsors in writing of the determination and the reasons for the deauthorization of project funding, together with the effective date. Payments made to the sponsors or recoveries by NRCS must be in accordance with the legal rights and liabilities of the parties when project funding has been deauthorized. An amendment to incorporate changes affecting a specific measure may be made by mutual agreement between NRCS and the sponsors having specific responsibilities for the measure involved.

13. Prohibitions. No member of or delegate to Congress, or resident commissioner, may be admitted to any share or part of this plan or to any benefit that may arise therefrom; but this provision may not be construed to extend to this agreement if made with a corporation for its general benefit.

14. Operation and Maintenance (O&M). The sponsors will be responsible for the operation, maintenance, and any needed replacement of the works of improvement by actually performing the work or arranging for such work, in accordance with an O&M agreement. An O&M agreement will be entered into before Federal funds are obligated and will continue for the project life (20 years). Although the sponsors' responsibility to the Federal Government for O&M ends when the O&M agreement expires upon completion of the evaluated life of measures covered by the agreement, the sponsors acknowledge that continued liabilities and responsibilities associated with works of improvement may exist beyond the evaluated life.

15. Emergency Action Plan. Prior to construction, the sponsors must prepare an emergency action plan (EAP) for each dam or similar structure where failure may cause loss of life or as required by state and local regulations. The EAP must meet the minimum content specified in NRCS Title 180, National Operation and Maintenance Manual (NOMM), Part 500, Subpart F, Section 500.52, and meet applicable State agency dam safety requirements. The NRCS will determine that an EAP is prepared prior to the execution of fund obligating documents for construction of the structure. EAPs must be reviewed and updated by the sponsors annually.

16. Nondiscrimination Provisions. In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

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17. Certification Regarding Drug-Free Workplace Requirements (7 CFR Part 3021). By signing this Watershed Agreement, the sponsors are providing the certification set out below. If it is later determined that the sponsors knowingly rendered a false certification, or otherwise violated the requirements of the Drug-Free Workplace Act, the NRCS, in addition to any other remedies available to the Federal Government, may take action authorized under the Drug-Free Workplace Act.

Controlled substance means a controlled substance in schedules I through V of the Controlled Substances Act (21 U.S.C. Section 812) and as further defined by regulation (21 CFR Sections 1308.11 through 1308.15);

Conviction means a finding of guilt (including a plea of *nolo contendere*) or imposition of sentence, or both, by any judicial body charged with the responsibility to determine violations of the Federal or State criminal drug statutes;

Criminal drug statute means a Federal or non-Federal criminal statute involving the manufacturing, distribution, dispensing, use, or possession of any controlled substance;

Employee means the employee of a grantee directly engaged in the performance of work under a grant, including (i) all direct charge employees, (ii) all indirect charge employees unless their impact or involvement is insignificant to the performance of the grant, and (iii) temporary personnel and consultants who are directly engaged in the performance of work under the grant and who are on the grantee's payroll. This definition does not include workers not on the payroll of the grantee (e.g., volunteers, even if used to meet a matching requirement, consultants or independent contractors not on the grantees' payroll, or employees of subrecipients or subcontractors in covered workplaces).

Certification:

A. The sponsors certify that they will or will continue to provide a drug-free workplace by—

(1) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition.

(2) Establishing an ongoing drug-free awareness program to inform employees about—

(a) The danger of drug abuse in the workplace.

(b) The grantee's policy of maintaining a drug-free workplace.

(c) Any available drug counseling, rehabilitation, and employee assistance programs.

(d) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.

(3) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (1).

(4) Notifying the employee in the statement required by paragraph (1) that, as a condition of employment under the grant, the employee must—

(a) Abide by the terms of the statement; and

(b) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than 5 calendar days after such conviction.

(5) Notifying the NRCS in writing, within 10 calendar days after receiving notice under paragraph (4)(b) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice must include the identification numbers of each affected grant.

(6) Taking one of the following actions, within 30 calendar days of receiving notice under paragraph (4)(b), with respect to any employee who is so convicted—

(a) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

(b) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency.

(7) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (1), (2), (3), (4), (5), and (6).

B. The sponsors may provide a list of the sites for the performance of work done in connection with a specific project or other agreement.

C. Agencies will keep the original of all disclosure reports in the official files of the agency.

18. Certification Regarding Lobbying (7 CFR Part 3018) (for projects > $100,000)

A. The sponsors certify to the best of their knowledge and belief, that—

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the sponsors, to any person for influencing or attempting to influence an officer or employee of an agency, Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned must complete and submit Standard Form LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The sponsors must require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients must certify and disclose accordingly.

B. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. Section 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

19. Certification Regarding Debarment, Suspension, and Other Responsibility Matters—Primary Covered Transactions (7 CFR Part 3017).

A. The sponsors certify to the best of their knowledge and belief, that they and their principals—

(1) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(2) Have not within a 3-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(3) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph A(2) of this certification; and

(4) Have not within a 3-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

B. Where the primary sponsors are unable to certify to any of the statements in this certification, such prospective participant must attach an explanation to this agreement.

20. Assurances and Compliance.

As a condition of the grant or cooperative agreement, the sponsor assures and certifies that it is in compliance with and will comply in the course of the agreement with all applicable laws, regulations, Executive orders and other generally applicable requirements, including those set out below which are hereby incorporated in this agreement by reference, and such other statutory provisions as a specifically set forth herein.

State, Local, and Indian Tribal Governments: OMB Circular Nos. A-87, A-102, A-129, and A-133; and 7 CFR Parts 3015, 3016, 3017, 3018, 3021, and 3052.

Nonprofit Organizations, Hospitals, Institutions of Higher Learning: OMB Circular Nos. A-110, A-122, A-129, and A-133; and 7 CFR Parts 3015, 3017, 3018, 3019, 3021 and 3052.

21. Examination of Records.

The sponsors must give the NRCS or the Comptroller General, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to this agreement, and retain all records related to this agreement for a period of three years after completion of the terms of this agreement in accordance with the applicable OMB Circular.

22. Signatures

The signing of this plan was authorized by a resolution by the Middle Niobrara Natural Resources District governing body and adopted at an official meeting held on February 12th, 2024 (date).

Gregory J Wilke
Greg Wilke, Chairman

88898 429th Ave, Ainsworth, NE 69210
Address

Middle Niobrara Natural Resources District.

By: Michael Murphy
Mike Murphy

Title: General Manager
General Manager

Date: 2/13/2024

Natural Resources Conservation Service
United States Department of Agriculture

Approved By: Robert Lawson
State Conservationist

2/16/2024
Date

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SUMMARY OF WATERSHED PLAN – ENVIRONMENTAL ASSESSMENT

OFFICE OF MANAGEMENT AND BUDGET FACT SHEET

for the
Bone and Long Pine Creeks Watershed

Brown, Cherry, and Rock Counties Nebraska
Middle Niobrara Natural Resources District
3rd CONGRESSIONAL DISTRICT

Authorization: Watershed Protection and Flood Prevention Act, Public Law (PL) 83-566, as amended (16 U.SC. Section 1001, et. Seq.)

Sponsor: Middle Niobrara Natural Resources District (MNNRD)

Lead Federal Agency: USDA – Natural Resources Conservation Service (NRCS)

Cooperating Federal Agency: U.S. Army Corps of Engineers (USACE)

Proposed Action: The proposed action includes grade stabilization structures, a stream crossing, a pond, a sediment control basin, streambank protection, and critical area planting along eleven (11) stream reaches within the Bone and Long Pine Creeks Watershed (watershed).

There is great variation in conditions across the watershed and there are many possible alternatives for addressing resource concerns with interventions at various locations. This Plan-EA serves both to address site-specific actions and to develop a programmatic approach for evaluating future site-specific actions. The preferred alternative is made up of projects which are divided into Tier 1 and Tier 2 project phases based on implementation timing. Specific high priority locations have been identified through the scoping process and interagency and landowner coordination and are included as Tier 1 projects. Other locations have been identified and ranked through the scoping process as Tier 2 projects, with design and site-specific environmental evaluations (EEs) to be completed in the future. Types and locations of site-specific alternatives are varied enough in this document to evaluate potential environmental consequences for tiered sites to reduce duplication of future NEPA documentation for similar projects with similar effects.

Purpose and Need for the Action: The project purpose is watershed protection through onsite treatment of watershed natural resources to provide grade control, bank stabilization, and aquatic ecosystem restoration and rehabilitation within the Project Area. The need for the proposed action is extensive stream degradation, widening, and habitat loss within the watershed. This need has been studied and documented extensively both by previous studies and through this planning effort.

Description of the Preferred Alternative Plan: The preferred alternative is made up of projects which are divided into Tier 1 and Tier 2 project phases based on implementation timing. Tier 1 of the preferred alternative includes thirty-six (36) structures/practices along eleven (11) stream reaches on Bone Creek, Sand Draw Creek, and Willow Creek. This includes grade stabilization structures, channel bed stabilization, restoration structures, a stream crossing, streambank and shoreline protection, critical area planting, obstruction removal, a pond, and a water and sediment control basin. Tier 2 of the preferred alternative

includes eleven (11) project locations, and eleven (11) stream reaches along Bone Creek, Sand Draw Creek, Willow Creek, and Long Pine Creek as well as 8 additional projects/structures located in the uplands. Grade stabilization and stream crossing structures were chosen with special consideration to aquatic organism passage and improved aquatic habitat.

Watershed Resource Information

Latitude and Longitude: 42°29′34″N, 99°49′47″W

Eight-Digit Hydrologic Unit Number: 10150004

Climate: The Watershed is in the semi-arid to humid continental climatic zone, with hot summers and cold winters. Summer high temperatures typically vary between 80- and 90-degrees Fahrenheit and winter low temperatures typically vary between -10 to 20 degrees Fahrenheit. According to the AgACIS, Ainsworth, NE Station, mean summer and winter temperatures are about 72 and 26 degrees Fahrenheit, respectively. The average annual precipitation is approximately 23 inches.

Topography: Watershed consists of Sandhills and flat tablelands. The Sandhills are typically a series of steep hills with valleys in between and the tablelands are relatively flat with gently rolling hills and steeper slopes near drainageways.

Watershed Size (acres): 332,310 acres

Long Pine Creek: 224,090 acres (Ten-Digit Hydrologic Unit Number: 1015000413)

Bone Creek: 108,220 acres (Ten-Digit Hydrologic Unit Number: 1015000412)

Land Use:

Grassland	240,860 acres
Cropland	54,460 acres
Wetlands	15,290 acres
Forest	11,410 acres
Developed	7,960 acres
Water	2,310 acres
Barren	20 acres

Source: 2018 USDA-NASS Cropland Data Layer

Land Ownership:

Private: 98.0 percent (325,820 acres)

State-Local: 1.4 percent (4,650 acres)

Federal: 0.6 percent (1,840 acres)

Source: Brown, Cherry, and Rock County Parcels, Accessed September 2020.

Table S-1. Social and Demographic Data

Social and Demographic Data	Brown County	Rock County	Cherry County
Population Data (2020 Census)			
Total Population	2,887	1,430	5,801
Male	1,390	763	2,920
Female	1,497	667	2,881

Social and Demographic Data	Brown County	Rock County	Cherry County
Under 19	644	353	1,491
65 years and over	790	349	1,213
Demographic Data (2020 Census)			
White	91.8%	96.9%	88.5%
Black or African American	0.1%	0.2%	0.2%
American Indian or Alaska Native	0.4%	0.1%	5.4%
Asian	0.3%	0.0%	0.1%
Native Hawaiian or other Pacific Islander	0.0%	0.0%	0.0%
Two or More Races	3.9%	2.1%	5.1%
Hispanic or Latino	6.1%	1.6%	2.7%
Poverty Data (2020 Small Area Income and Poverty Estimates)			
Percent of population below poverty level	11%	13%	11%
Percent of children below poverty level	15%	18%	15%
Agriculture (2017 Agricultural Census)			
Number of Farms	270	220	570
Average size (acres)	2,300	2,660	6,280

Relevant resource concerns identified through scoping: Erosion and sedimentation, prime and unique farmland, water quality, water quantity, regional water management plans, wetlands, streams, wild and scenic rivers, threatened and endangered species, natural areas, riparian areas, fish and wildlife habitat, biologically unique landscapes, migratory birds, bald and golden eagles, archeological and historical resources, environmental justice, public health and safety, and recreation.

Alternative Plans Considered: Non-structural alternatives including changes to policy, existing land use, infrastructure, management practices, land acquisition, and irrigation water management were considered. Thirty-seven (37) different structural alternatives were considered at each of the Tier 1 locations and the least costly socially and environmentally acceptable alternative that could meet the purpose and need were selected for detailed analysis. Two alternative combinations were chosen for detailed analysis – the No Action Alternative and the preferred alternative.

Mitigation: The Tier 1 phase of the preferred alternative would result in a loss of 0.38 acres of wetlands. Compensatory wetland mitigation is not anticipated due to individual site loss limits and overall improvements to stream function and aquatic habitat. The preferred alternative would result in stream improvements throughout the watershed by providing grade stabilization and streambank protection benefits, which will result in increased stream function and habitat. The Nebraska Stream Condition Assessment Procedure (NeSCAP) was performed for streams for existing conditions within each Affected Resource Area (ARA). This procedure will also be followed for future, proposed conditions as part of final design to ensure a functional lift at each project site and therefore no stream mitigation is anticipated. Any mitigation associated with the Tier 2 phase would be identified through the EE process and become part of the implementation requirements.

Project Costs: Final design for all Tier 1 sites would occur in the year 2023. Construction would occur over a 5-year period for Tier 1 sites. EEs and final design for Priority 1 and 2 Tier 2 sites would occur in the first

5 years and construction would occur over a 9-year period. Priority 3 Tier 2 sites would be completed as funding allows and needs are identified.

Table S-2 and S-3 show the distribution of estimated total project costs for Tier 1 and Priority 1 and 2 Tier 2 sites. The estimated average annual operation and maintenance costs are $26,800 for Tier 1 projects and $32,000 Priority 1 and 2 Tier 2 projects.

Table S-2. Distribution of Total Project Costs, Installation of Preferred Alternative (Tier 1)

Project Costs	P.L. 83-566 Funds	Other Funds	Total
Construction[1]	$3,630,400	$1,239,700	$4,870,100
	75%	25%	100%
Engineering[2,3]	$1,694,200	$241,900	$1,936,100
	88%	12%	100%
Real Property Rights	$0	$0	$0
	0%	100%	100%
Project Administration	$169,100	$169,100	$338,200
	50%	50%	100%
Total Project	$5,493,700	$1,650,700	$7,144,400
	77%	23%	100%
Annual O&M	$0	$ 26,800	$26,800

[1]*Includes mitigation and replacement*
[2]*Includes construction observation*
[3]*Includes permit acquisition*

Table S-3. Distribution of Total Project Costs, Installation of Preferred Alternative (Tier 2, Priority 1 and 2)

Project Costs	P.L. 83-566 Funds	Other Funds	Total
Construction[1]	$4,834,300	$1,611,200	$6,445,500
	75%	25%	100%
Engineering[2,3]	$2,578,500	$315,100	$2,893,600
	89%	11%	100%
Real Property Rights	$0	$0	$0
	0%	100%	100%
Project Administration	$225,900	$225,900	$451,800
	50%	50%	100%
Total Project	$7,638,700	$2,152,200	$9,790,900
	78%	22%	100%
Annual O&M	$0	$32,000	$32,000

[1]*Includes mitigation*
[2]*Includes construction observation*
[3]*Includes permit acquisition*

Project Benefits: This plan is considered a 'non-water-resources project' that includes watershed protection through onsite treatment of watershed natural resources to provide grade control, bank stabilization, and aquatic ecosystem restoration and rehabilitation and therefore monetary benefits were not required to be developed. The recommended plan is the least costly socially and environmentally acceptable method of achieving the agreed-upon level of resource protection. The preferred alternative will provide stream stability, reduced erosion and sedimentation, improved water quality, improved stream function and aquatic habitat, will work in conjunction with other Regional Water Management Plans, and will improve recreation.

Number of Onsite Beneficiaries: 206

Number of Offsite Beneficiaries: 2,903

Funding Schedule: 2023 – 2031

Period of Analysis: 29 years (includes installation)

Project Life: 20 years

Environmental Effects and Impacts: Table S-4 summarizes resource elements that were identified during scoping and summarizes potential impacts related to the installment of the Project.

Table S-4. Summary of Resource Concerns and Impacts

Item or Concern	Alternative 2. Combination 1. Preferred Alternative
Erosion and Sedimentation	Reduction in annual sedimentation through grade control and bank stability measures <u>Sediment Storage:</u> Will capture and store 15.5 acre-feet of sediment over the design life.
Prime and Unique Farmland	Will decrease prime and unique farmland lost to stream degradation and widening. No Farmland Protection Policy Act (FPPA) significant concerns.
Migratory Birds/Bald and Golden Eagles	Habitat destructive activities will be avoided during the active nesting season for migratory birds. Because bald eagles are known to nest in the area, habitat destructive activities will be avoided from nest initiation through fledging timeframe, and surveys will be conducted prior to implementation.
Threatened and Endangered Species & Fish and Wildlife Coordination Act	No significant impacts are predicted for any of the listed species' suitable habitat that would prevent the creation of a FONSI based off of site investigation, feedback from agencies, and IPaC/CERT reports. However, because no definite determinations were made, additional consultation with both USFWS and NGPC will be required prior to implementation of any measure selected as the preferred alternative.
Biologically Unique Landscapes (BUL)	Outside of BULs. Will improve water quality to downstream BUL by providing grade stabilization and shoreline protection.
Water Quality	Reduction in erosion and influx of nutrients from sediment to downstream waterbodies.
Water Quantity	Minor improvements from decrease in water quantity and resulting stream stability downstream of P2-4 and G2-5.

Item or Concern	Alternative 2. Combination 1. Preferred Alternative
Regional Water Management Plans	Project at all sites align with the goals and objectives of other water resource plans in the watershed, which include improving water quality with stream stabilization. Potential to leverage Federal funds with other local, regional, and State funding sources to reach watershed goals.
Streams	Overall, stream function will improve with this Alternative. Preventing headcut progression and stream degradation and widening will result in an increase in stream function and habitat. Some fill, inundation, and excavation will result from the implementation of the proposed structures. Total Impacts (fill, excavation, inundation): Intermittent: 2,964-feet Perennial: 8,871-feet See Chapter 5 of the Plan-EA for impact specifics.
Wetlands	Net loss of approximately 0.38 acres of wetlands. Wetlands are predicted to establish near G2-2-2 and prevention of future destruction of wetlands due to degradation/widening is anticipated at ARAs 5, 6, 10, and 12.
Riparian Areas	Streams will be stabilized resulting in the protection of riparian areas. Improvement to approximately 5.4 acres of riparian habitat at CP2-34 by re-establishing riparian vegetation.
Public Health and Safety	Alternative will improve safety and protect infrastructure along stream corridors.
Climate Change	Climate change in Nebraska could result in an increase in extreme storm events, leading to increased stream degradation rate. Alternative would increase climate change resiliency by protecting streams from headcut progression and stream degradation.
Land Use	No effect.
Wild and Scenic Rivers	Alternative does not invade or diminish the Wild or Scenic River (Niobrara River).
Natural Areas	Features at ARA 12 would provide grade control that would protect upstream natural areas protected by NGPC.
Fish and Wildlife Habitat	Protection of terrestrial and aquatic habitat due to reduction in stream degradation and widening. Implementation of in-stream habitat improvement measures and fish passage techniques to provide for and improve fish habitat.
Archeological and Historical Resources	Cultural resource investigations were completed for Tier 1 location Areas of Potential Effect (APEs). It was determined no historic properties will be affected. Additional cultural resource investigations will be completed for Tier 2 location APEs during the environmental evaluation process.
Environmental Justice	Alternative would not disproportionately impact minority, Tribal, or low-income populations.
Recreation	Improved in-stream fish habitat resulting in improved fishing within the watershed.

Major Conclusions: The preferred alternative as presented in this Plan-EA is the least costly socially and environmentally acceptable method of achieving the agreed-upon level of resource protection, most closely met the PR&G Guiding Principles, including the Federal Objectives, and was the locally preferred alternative. The combination of alternatives will provide grade control, bank stabilization, and aquatic ecosystem restoration and rehabilitation. The preferred alternative will also provide ancillary benefits of improved fish and wildlife habitat, improved stream function, recreation, infrastructure protection, and enhanced water quality.

Areas of Controversy: The planning process included in-person and online public meetings, coordination with interested agencies and groups, a project website, and printed public information to raise issues, resolve conflicts, and recommend the most desirable plan features. No unresolved controversy remains.

Issues to be Resolved: None.

Evidence of Unusual Congressional or Local Interest: None. This report is in compliance with executive orders, public laws, and other statutes governing the formulation of water resource projects.

Is this report in compliance with executive orders, public laws, and other statues governing the formulation of water resource projects? Yes __X___ No ____

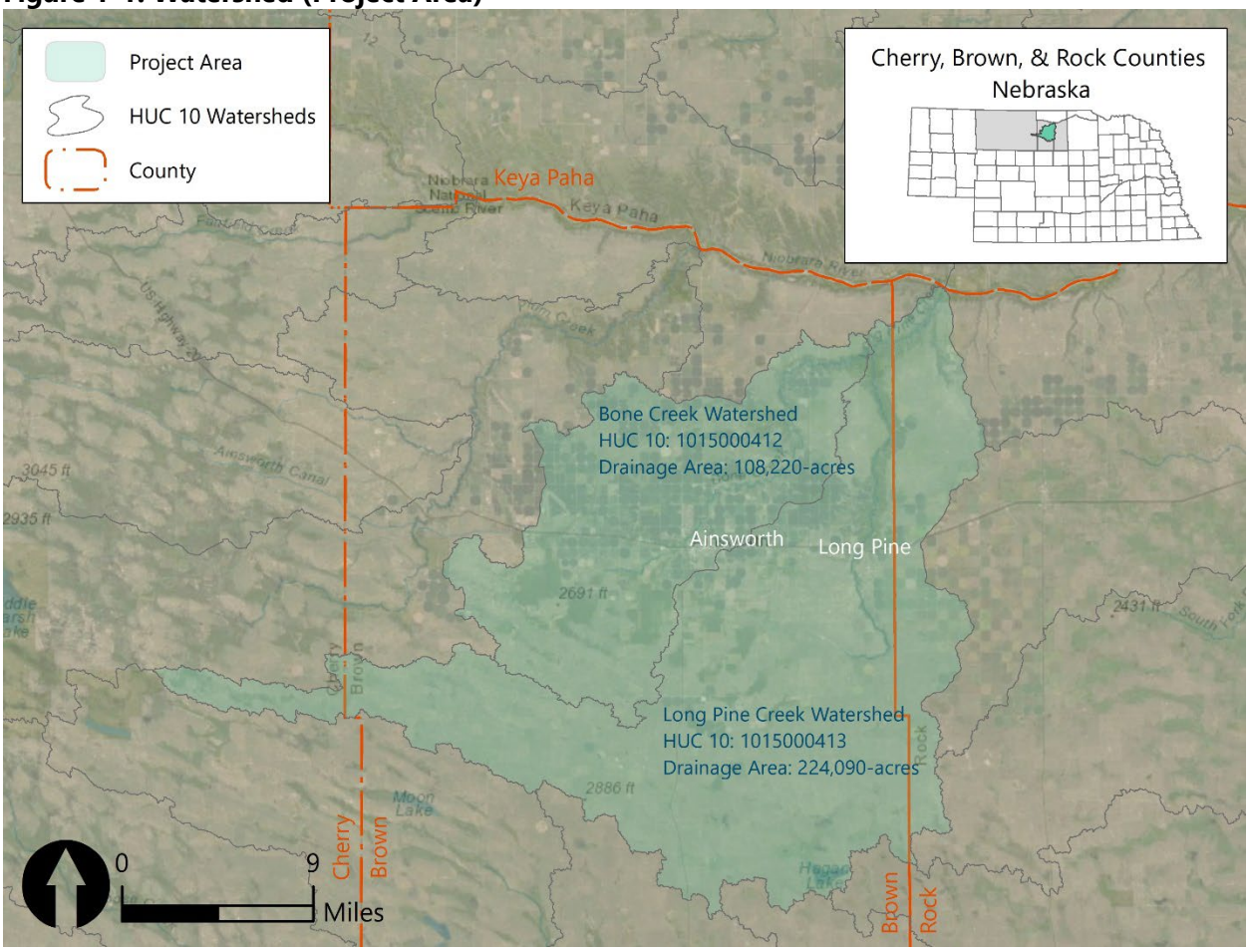
1.0. PURPOSE AND NEED FOR ACTION

1.1 Introduction

This Watershed Plan and Environmental Assessment (Plan-EA) for the Long Pine Creek and Bone Creek Watersheds (watershed) has been developed in cooperation with the U.S. Department of Agriculture, Natural Resources Conservation Service, Nebraska (USDA – NRCS) and the Middle Niobrara Natural Resources District (MNNRD, Sponsor). The intent of this document is to satisfy National Environmental Policy Act (NEPA) and Principles, Requirements, and Guidelines for Water and Land Related Resources Implementation Studies (PR&G) requirements and to follow NRCS guidelines. The U.S. Army Corps of Engineers (USACE) is a Cooperating Agency and Clean Water Act (CWA) Section 404 permitting requirements have been considered during the development of this Plan-EA. This chapter describes the purpose and need for the project and provides a history of the watershed.

The watershed (or Project Area) described and analyzed in this document consists of two identified hydrologic units with unique 10-digit hydrologic unit codes (HUC) in north central Nebraska, as shown below in Figure 1-1. The project area spans three counties and over 332,310 acres, with most of the area falling within Brown County. Agriculture, including ranching, dominates the rural landscape. The towns of Ainsworth and Long Pine are the two main population centers within the watershed.

Figure 1-1. Watershed (Project Area)



1.2 Purpose and Need

The project purpose is watershed protection through onsite treatment of watershed natural resources to provide grade control, bank stabilization, and aquatic ecosystem restoration and rehabilitation within the Project Area. The need for the proposed action is extensive stream degradation, widening, and habitat loss within the watershed. This need has been studied and documented extensively both by previous studies and through this planning effort, as described throughout this chapter. Further, this Plan-EA intends to identify proactive programmatic planning that enables efficient partnerships with agency, stakeholder, and other funding sources and to assist in a more streamlined application of NEPA for future associated project implementation for similar projects with similar effects.

The watershed is large and varying and the streams within it vary greatly as well (stream locations are shown in Figure 3-6). This is true both for each stream individually, as they change drastically from headwaters to the downstream confluences, and that they vary from each other. Sand Draw and Bone Creek are more similar than Long Pine Creek or Willow Creek and follow similar changes as they transition from small, shallow creeks in the headwaters to wide, degraded streams near the middle of the watershed. Long Pine Creek is on the Nationwide Rivers Inventory and boasts excellent cold-water fisheries habitat and recreation opportunities in the middle and downstream portions of the watershed but has seen degradation and widening recently and also experienced heavy aggradation in the upstream reaches. Willow Creek transitions from the shallow headwaters to deep, degraded conditions more quickly within the watershed than Sand Draw or Bone Creek and is only in the beginning stages of widening.

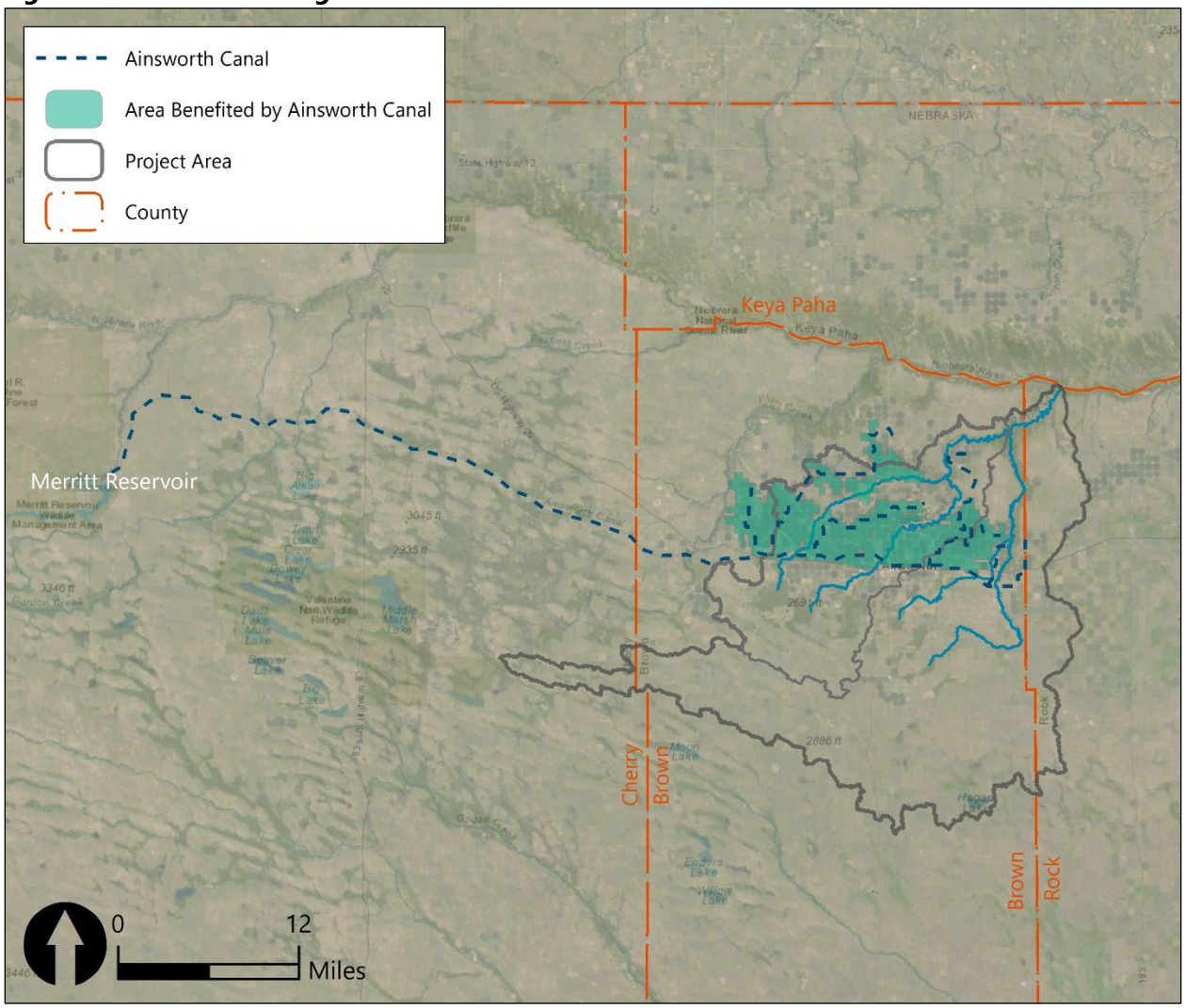
Stream degradation and widening have been identified as the main areas of concern within this watershed, both during recent scoping and outreach as well as previous studies. The Long Pine Creek Watershed Water Quality Management Plan (2016) identified stream restoration projects as potential solutions to improve water quality and aquatic resources. The Nebraska Long Pine Creek, Rural Water Program (1991) also identified and implemented stream bed and bank stabilization measures to improve water quality. The inability to address streambank erosion in Bone and Sand Draw Creeks was seen as a major implementation difficulty for the 1991 program study and therefore further work was identified as a need in these systems. Progressive stream degradation has also led to reduced floodplain connectivity, bedful diversity, and wider and warmer streams thus leading to reduced habitat for fish and other aquatic and terrestrial species. As extensive as stream degradation and habitat devastation is in the downstream reaches, streams within the upper reaches are just beginning to degrade and have characteristics that enable small-scale improvements to reap large benefits.

1.3 Watershed History

The watershed borders the northeastern edge of the Nebraska Sandhills and was settled in the mid to late 1800s. From the time of settlement to the mid-1960s, the area mainly supported ranching and some dryland farming. Landowners began pursuing the potential for irrigation in the late 1940s and in 1946 the Bureau of Reclamation began a study of the Niobrara River Basin. This study resulted in the recommendation of developing the Ainsworth Unit. The Ainsworth Unit was authorized as an integral part of the Missouri River Basin Project on August 21, 1954 by Presidential approval of Public Law 612, 83rd Congress, 2nd session (68 Stat. 757). Merritt Reservoir was constructed on the Snake River in May of 1964 and water transfer began in June of 1965. Water is transferred almost 50-miles from Merritt Reservoir along partially lined canals to

irrigate approximately 34,000-acres of farmland, mainly within the Bone Creek watershed. This effort adds approximately 16-inches of water annually to these farmlands. The Ainsworth Irrigation District (AID) has been responsible for the operation and maintenance of the Ainsworth unit since it took over responsibility in April of 1967. Figure 1-2 below shows the Ainsworth Canal and benefited areas.

Figure 1-2. Ainsworth Irrigation District



Residents began expressing concerns with changes in surface and groundwater and water quality within the watershed in the late 1960s. Water quality monitoring studies performed in the 1960s-1970s by state and federal agencies also revealed a steady degradation throughout the watershed. Nitrates, pesticides, excess sediment, bacteria, and stream degradation were all identified problems. Various studies have been conducted both on the watershed and the AID and many of these are listed with a general overview in Appendix D.

1.3.1 Changes in Water Quantity

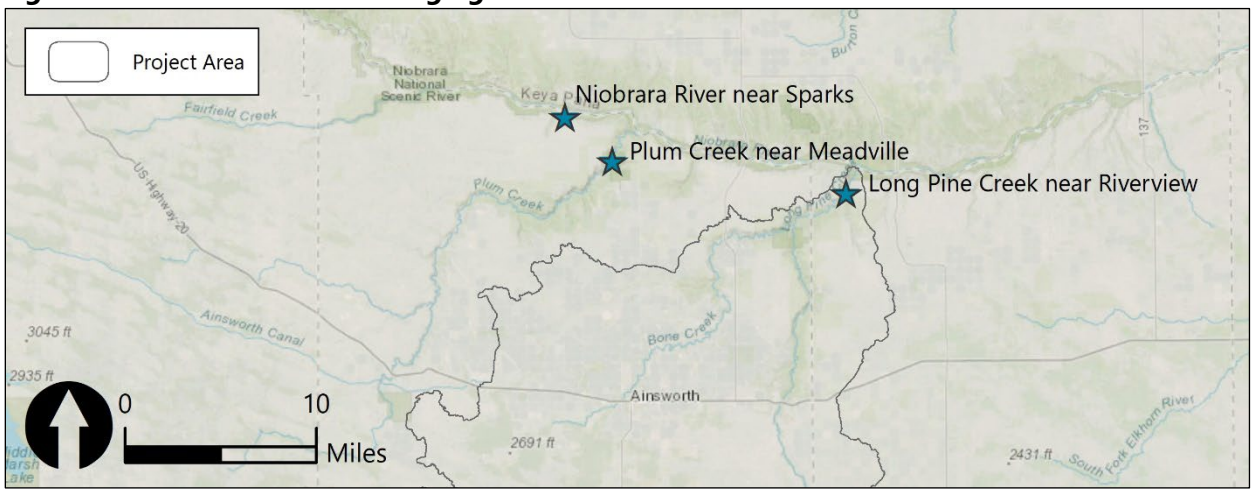
Landowners and other stakeholders within the watershed have noted stream flow increases, stream degradation and widening, and increases in groundwater all starting in the late 1960s. Changes in stream

types have also been observed, with Sand Draw Creek evolving from an ephemeral stream (only flows after rain events) into a perennial stream (typically flows year-round) around the late 1960s.

Analyses of historical rainfall, stream flow, groundwater levels, and meteorological conditions were performed on all available data within the watershed as well as several locations outside of the watershed to discern trends and establish cause and effect of witnessed stream flow changes and channel degradation. The obvious addition of a significant quantity of irrigation water from Merritt Reservoir was of primary concern, but other factors were considered. Of particular interest was the possibility that a climate shift has been causing a transition to more significant rainfall or rainfall rates.

Analysis of rainfall data shows that no discernable, significant trend in rainfall appears to be behind the shift in flow rates or increase in degradation. Since 1975, the region has entered into a slightly wetter period than the previous 50 years, more similar to the early 1900s, as indicated by the Palmer Drought Severity Index (PDSI) and seasonal rainfall totals. Given the shift to a wetter period, an increase in average discharge on the area streams is expected, which is seen at both Niobrara River near Sparks and Long Pine Creek near Riverview (see Figure 1-3, below). However, the increase in the Niobrara River behaves proportionally to the increase in rainfall whereas Long Pine Creek's behavior is nonproportional. Inspection of the watershed yield shows an increase only in the region that has been utilizing supplemental irrigation water. This implies that the rate of runoff per inch of rainfall has not changed outside of the regions that have supplemented with additional irrigation water. The watershed yield appears to have peaked in the late 1990s and is starting to decrease. More detailed information on this analysis is provided in Appendix D.

Figure 1-3. USGS Streamflow Gaging Stations



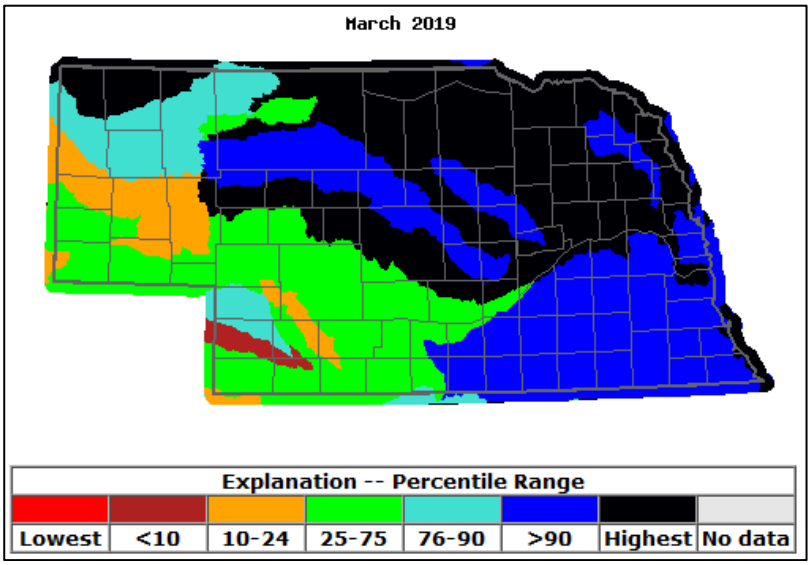
Assessment of groundwater trends using well data shows a steady increase from the 1960s to the early 2000s. However, the trend over the last 20 years has been slightly to moderately downward, depending on location. As these pieces of data are put together, we are left to conclude that the application of significant quantities of irrigation water over the watershed has increased groundwater levels and increased channel baseflow. Increased baseflow within the system leads to channel degradation and streambank steepening, especially during higher precipitation events. With the stream cutting further into the saturated ground, baseflow is increased even more, and the cycle repeats. This change has shifted several streams in the watershed from ephemeral and intermittent to perennial flow patterns. Available data suggest that the

downstream reaches within the watershed are beginning to reach quasi-equilibrium while the mid to upper reaches of the watershed likely have the potential for impending significant degradation and widening. More detailed information on this analysis is provided in Appendix D.

1.3.2 Work in the Watershed

Concerns in the watershed have led to implementation of several projects and conservation measures in addition to the previous studies and planning efforts. Various small-scale grade stabilization and conservation projects have been funded throughout the watershed through NRCS programs such as the Environmental Quality Incentives Program (EQIP) and The Nebraska Long Pine Creek, Rural Water Program (1991). Small gully embankments and cedar revetments have proven successful in providing grade control and improving fish habitat. Larger-scale projects, including habitat restoration, grade stabilization, and riparian improvements, have been implemented through the Nebraska Department of Energy (NDEE) Section 319 funds and will be implemented through the Nebraska Department of Transportation (NDOT) on Sand Draw Creek at Old Highway 7. Additional water quality, restoration, stabilization, and habitat improvement projects have also been constructed through partnerships with the Sandhills Taskforce, U.S. Fish and Wildlife Service (USFWS), Nebraska Game and Parks Commission (NGPC), landowners, the Sponsor, local governments, and others. Recent rock structures placed on Sand Draw and Long Pine Creek have shown promising results for grade stabilization and habitat improvements within the watershed. These projects will continue and have been considered in the holistic approach to addressing the problems and opportunities within the watershed through this Plan-EA and subsequent implementation.

1.3.3 2019 Flood Events



Source: USGS Waterwatch – Watershed yield percentile

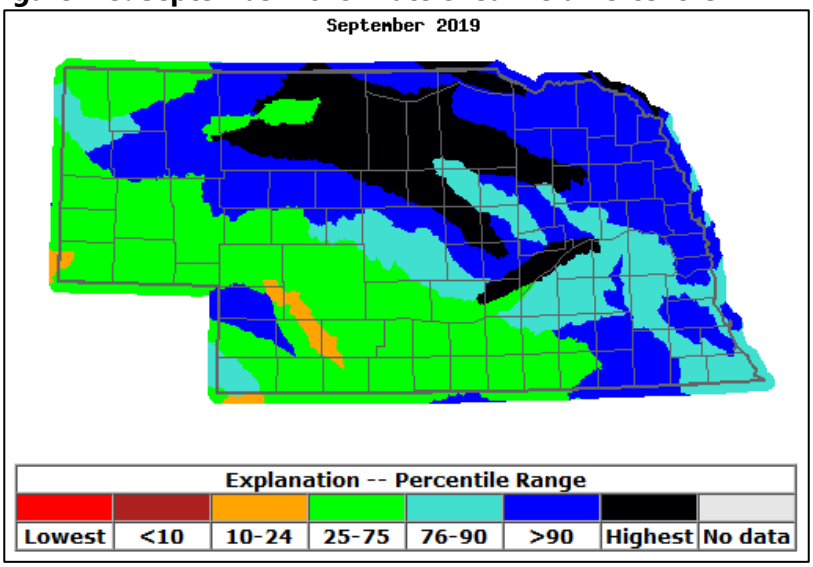
Stream degradation and widening and subsequent loss of habitat within the watershed have been occurring for decades but significant events in 2019 brought widespread damage to streams and infrastructure that are important to acknowledge for context and to provide insight into the existing conditions of the watershed.

Figure 1-4. March 2019 Watershed Yield Percentile

Two flood events affected the region in 2019: a spring snowmelt event in March and back-to-back thunderstorms in September. The spring snowmelt event was caused by above average, late season snowpack and a widespread early spring rainfall event. The existing snowpack exceeded three inches of water equivalent which melted in less than 48 hours. The rapid snow melt was caused by warm temperatures and between two and three inches of rainfall occurring over a three-day period.

The combined rainfall with rapid snow melt led to flooding, but more importantly, saturated ground conditions and a surplus of standing water that lasted through the summer months as the infiltrated water slowly moved through the pervious soils. The watershed yield from these basins in March of 2019 is the largest runoff month to have occurred since at least 1901 (USGS) as shown in Figure 1-4.

Figure 1-5. September 2019 Watershed Yield Percentile



Source: USGS Waterwatch – Watershed yield percentile

September of 2019 also brought a major flood event. Two significant thunderstorms moved through the area within 24 hours, yielding up to 10-inches of rainfall. Area soils were already inundated with high groundwater levels from above average yield in the spring combined with higher groundwater levels from years of agricultural irrigation. While the March flood event was significant, the September flood was catastrophic. The watershed yield in September 2019 was again the highest recorded since at least 1901 (Figure 1-5). This level of runoff has not been seen since before 1926 when all of the largest summer runoff periods occurred in the wet period from 1901 to 1926.

This event caused major infrastructure damage, stream widening, and sand deposition including the destruction of a major culvert on Sand Draw Creek and Old Highway 7. The culvert was acting as a grade control structure, preventing a nearly 20-foot headcut from moving upstream before the storms (JEO 2014). Without the culvert acting as a grade control structure the headcut has since begun to migrate upstream in the form of multiple steep sections of stream between Old Highway 7 and 430th Avenue (one mile upstream). Photographs 1 and 2 below give an idea of the magnitude of damage.

Photograph 1. Looking upstream of Old Highway 7 in 1991 (NDOT)

Photograph 2. Looking downstream at the Old Highway 7 failure that occurred in 2019 (FYRA, 2020)

1.4 Federal Objective and Guiding Principles

As set forth in the Water Resources Development Act of 2007 and as stated in the PR&G, the Federal Objective specifies the fundamental goal of Federal investments in water resources and is as follows:

> Federal water resources investments shall reflect national priorities, encourage economic development, and protect the environment by:
>
> (1) seeking to maximize sustainable economic development;
>
> (2) seeking to avoid the unwise use of floodplains and flood-prone areas and minimizing adverse impacts and vulnerabilities in any case in which a floodplain or flood-prone area must be used; and
>
> (3) protecting and restoring the functions of natural systems and mitigating any unavoidable damage to natural systems.

The Guiding Principles are overarching concepts that the Federal government seeks to achieve through the Federal Objective and are listed below. It is important to note that they do not have a hierarchal relationship and are therefore not listed in order of rank or importance.

A. Healthy and Resilient Ecosystems
B. Sustainable Economic Development
C. Floodplains
D. Public Safety
E. Environmental Justice
F. Watershed Approach

2.0 SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The scope of the EA is based on an evaluation of resources and potential concerns identified during scoping by NRCS, the Sponsor, and interested agencies and individuals. The following chapter identifies the resources of concern that were deemed relevant to decision making as well as resources that were considered but not studied in detail.

A scoping meeting was held with the Sponsor, local and state NRCS, Brown County, National Park Service, and the Ainsworth Irrigation District in November 2019 to discuss problems and opportunities within the watershed and to identify potential resource concerns. Additional scoping meetings were held between the Sponsor and NRCS.

Public and agency scoping meetings were held in February 2020 to give agencies and the public opportunities to express concerns in person, by email, and through comment cards provided at the meetings. Feedback provided at these meetings was used to assist in scoping the resources of concern for this EA. Please refer to Chapter 6.0 for additional information on public and agency meetings.

A summary of scoping is provided in Table 2-1, which identifies resources that are relevant to the project and studied in further detail within this EA.

Table 2-1. Summary of Scoping

Item/Concern	Relevant?		Rationale
	Yes	No	
Soils			
Sheet, Rill, Gully, and Streambank erosion	X		Erosion is a problem due to highly susceptible soils and excess water.
Sedimentation	X		Aggradations of eroded sediment contributes to sedimentation and impacts water quality and fish habitat.
Prime and Unique Farmland	X		Alternatives could impact prime and unique farmland. Further analysis is included in Chapter 5.
Water			
Water Quality	X		Impaired waters due to sedimentation, excess nutrients, and elevated water temperatures.
Water Quantity	X		Increased stream baseflow contributes to stream degradation and streambank erosion.
Regional water management plans	X		Water management plans exist for the watershed.
Floodplain Management	X		Impacts of alternatives will be analyzed in accordance with Executive Order 11918 and 13690.
Wetlands and other Waters of the U.S.	X		USACE Section 404 permit may be required

Item/Concern	Relevant?		Rationale
	Yes	No	
Wild and Scenic Rivers	X		The Niobrara (immediately downstream of the watershed) is a Wild and Scenic River and Long Pine Creek is on the Nationwide Rivers Inventory. Alternatives may impact these resources.
Sole Source Aquifers		X	There are no designated sole source aquifers within or near the project area.
Air			
Air Quality		X	Potential alternatives will not impact the emission rate of any regulated air pollutant and is subject to any other air quality regulation.
Plants			
Threatened and Endangered Species & Fish and Wildlife Coordination Act	X		Species have known ranges within the watershed.
Invasive Species	X		Impacts of alternatives will be analyzed in accordance with Executive Order 13112.
Natural Areas	X		Natural areas may be impacted.
Riparian Areas	X		Riparian areas may be impacted.
Habitats			
Fish and Wildlife Habitat / Forest Areas	X		Alternatives could impact fish and wildlife habitat.
Essential Fish Habitat		X	There is no designated essential fish habitat within the watershed.
Coastal Zone Management		X	The watershed is not near any designated coastal zone management areas.
Biologically Unique Landscapes / Ecologically Critical Areas	X		Three biologically unique landscapes are located within the watershed.
Coral Reefs		X	The watershed does not contain coral reefs or associated water bodies.
Animals			
Threatened and Endangered Species & Fish and Wildlife Coordination Act	X		Species have known ranges within the watershed.
Invasive Species	X		Impacts of alternatives will be analyzed in accordance with Executive Order 13112.
Migratory Birds/Bald and Golden Eagles	X		Migratory birds and bald eagles may be impacted.
Humans			
Archaeological and Historical Resources	X		Archaeological and/or historical resources may be impacted.
Potable Water Supply		X	Sufficient potable water. The alternatives will not impact potable water supplies.

Item/Concern	Relevant?		Rationale
	Yes	No	
Environmental Justice	X		The potential environmental impacts of the alternatives will be studied with respect to the demographic and socioeconomic composition of the watershed and project area to ensure no minority or low-income populations would be adversely affected by implementation of any of the alternatives.
Public Health and Safety and Social Issues	X		Stream degradation, widening, and associated infrastructure damages are a threat to public health and safety.
Recreation	X		Regionally important recreation facilities are located within and near the watershed.
Scenic Beauty and Parklands		X	No specifically designated valuable scenic landscapes within the watershed. Alternatives will not degrade scenic beauty of the general landscape and may protect scenic beauty throughout the watershed.
Land Use	X		Overall land use is discussed throughout the document and specifically in Section 5.26.2.
Cost	X		Required by the Principles, Requirements, and Guidelines for Water and Related Land Resources Implementation Studies (PR&G)

3.0 AFFECTED ENVIRONMENT

The following chapter describes the existing conditions of resources identified as relevant during scoping (see Table 2-1).

3.1 Erosion and Sedimentation

Approximately 51,130-tons of sediment are produced annually within the watershed from overland erosion from field and gullies and streambed and bank erosion. Sedimentation from surface runoff resulting from precipitation (sheet, rill, gully, and streambank) makes up approximately 90 percent of the sediment load, contributing roughly 46,290 tons annually. Baseflow from groundwater contributes almost entirely to streambank erosion and results in approximately 4,840 tons/year of delivered sediment annually within the watershed. The sedimentation from erosion within the watershed impacts sediment loads entering the downstream Niobrara River, which is experiencing a sediment plume that is moving towards the Missouri River. Calculated annual surface and baseflow sedimentation values for the USGS 12-digit hydrologic unit code (HUC 12) subwatersheds within the watershed were obtained from the Long Pine Creek Watershed Water Quality Management Plan (WQMP) and are shown in Table 3-1 and Figure 3-1 below.

A water quality model was developed by the Wright Waters Engineers, Inc. in 2014 as part of a study to calculate sediment and pollutant loads within the watershed for the WQMP. Stream bank erosion was estimated from a visual stream assessment and using a stream bank lateral recession rate based on the stream stage. The sediment loads calculated from the study were selected to be included in this Plan-EA due to the same study area, recent analysis, relatively unchanged meteorological, topography, soil types, and land use conditions. Current sedimentation values may vary slightly from the WQMP due to the watershed's current state of recovery from flood events in 2019. However, overall annual sediment loads from the WQMP would remain relatively unchanged and are expected to experience a gradual, slow recovery.

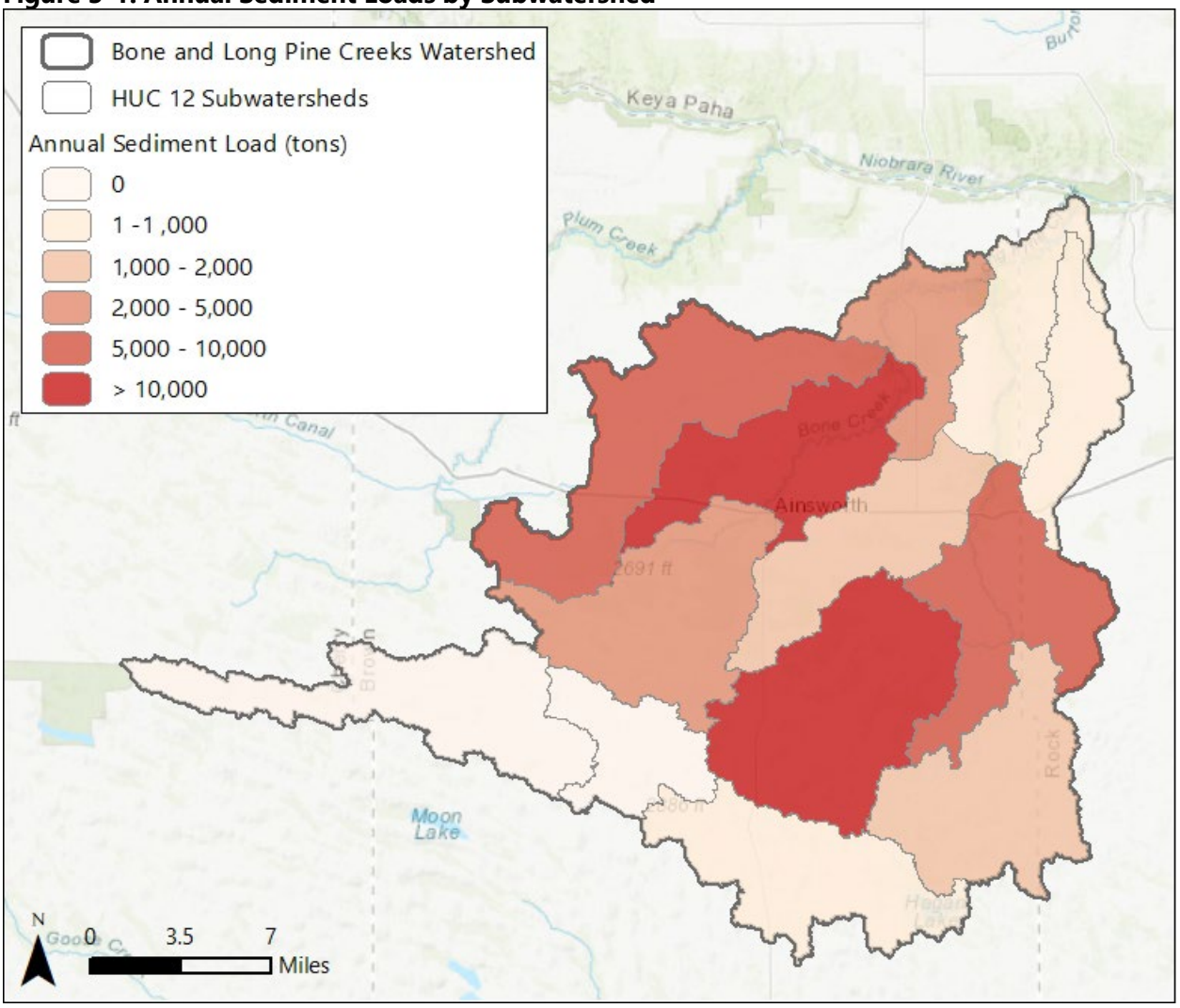
Table 3-1. Annual Sedimentation by Subwatershed

		Sedimentation (tons/year)[1]		
Subwatershed	HUC 12	Sheet, Rill, Gully, and Streambank	Streambank from baseflow	Total
Harr Valley (closed basin)	101500041301	0	0	0
Jones Lake	101500041303	140	0	140
Lower Bone Draw	101500041204	4,660	500	5,160
Lower Long Pine Creek	101500041309	630	60	690
Middle Bone Creek	101500041203	10,250	1,080	11,330
Middle Long Pine Creek	101500041307	7,480	800	8,280
Sand Draw	101500041202	6,210	630	6,840
Short Pine Creek	101500041308	150	0	150
Spring Branch	101500041304	1,740	180	1,920
Upper Bone Draw	101500041201	3,120	320	3,440
Upper Long Pine Creek	101500041305	10,710	1,170	11,880
White Cap Hill (closed basin)	101500041302	0	0	0
Willow Creek	101500041306	1,200	100	1,300

		Sedimentation (tons/year)[1]		
Subwatershed	**HUC 12**	**Sheet, Rill, Gully, and Streambank**	**Streambank from baseflow**	**Total**
Total		**46,290**	**4,840**	**51,130**

[1]*Source: JEO Consulting Group, Inc. Long Pine Creek Watershed Water Quality Management Plan. March 2016.*

Figure 3-1. Annual Sediment Loads by Subwatershed



[1]*Source: JEO Consulting Group, Inc. Long Pine Creek Watershed Water Quality Management Plan. March 2016.*

3.2 Prime and Unique Farmland

The Farmland Protection Policy Act (FPPA) was established to avoid significant, irreversible losses of farmland. Prime farmland (defined under the FPPA) and farmland of statewide importance are lands that exhibit the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is also available for these uses (SSM 2017). These lands have the soil quality, growing season, and moisture supply needed to produce economically sustainable high yields of crops. The use of acceptable farming methods, including water management, can be used to attain the sustainable yields. Prime farmlands generally have an adequate and dependable water supply (from precipitation or irrigation),

are not excessively erodible or saturated for long periods of time, and do not flood frequently (SSM 2017). Prime farmland is land that is available for farming, but could currently be cropland, pastureland, rangeland, forestland, or other land, but not urban built-up land or water. More information about the criteria for prime farmland and farmland of statewide importance is available at the local office of the NRCS.

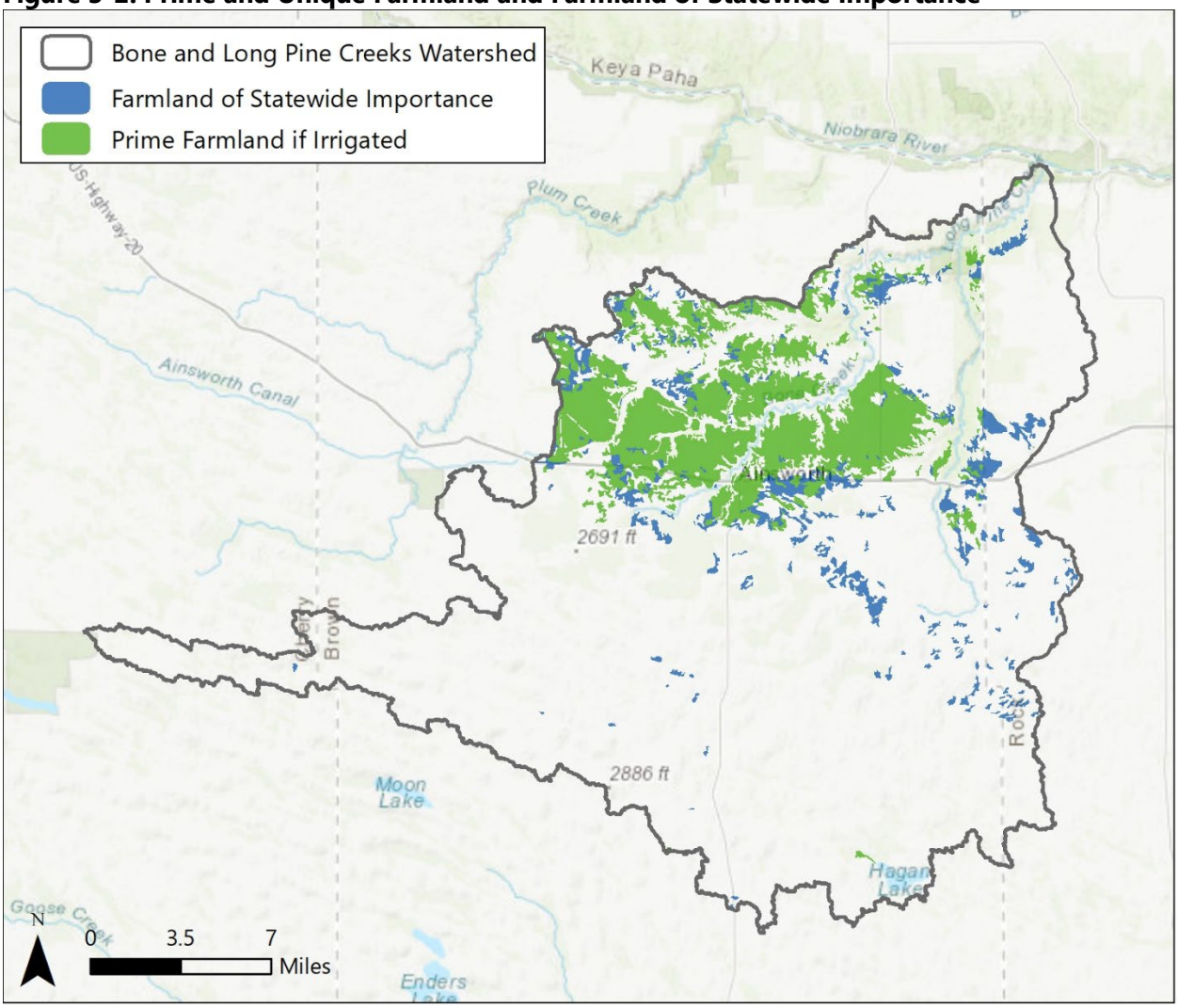
There are approximately 51,170 acres of prime farmland and farmland of statewide importance within the watershed, which is about 15 percent of the total watershed. Figure 3-2 shows the extent of the prime farmland and farmland of statewide importance within the Watershed. The soil types and areas of NRCS soil map units are included in Table 3-2 below.

Table 3-2. Prime Farmland and Farmland of Statewide Importance within Watershed

Map Unit Symbol	Map Unit Name	Rating	Area (acres)
3156	Brocksburg loam, 0 to 2 percent slopes	Prime farmland if irrigated	990
3180	Jansen fine sandy loam, 0 to 2 percent slopes	Prime farmland if irrigated	2020
3181	Jansen fine sandy loam, 2 to 6 percent slopes	Prime farmland if irrigated	1670
3183	Jansen loam, 0 to 2 percent slopes	Prime farmland if irrigated	3430
3184	Jansen loam, 2 to 6 percent slopes	Prime farmland if irrigated	3970
3194	Jansen-Sandose complex, 0 to 2 percent slopes	Farmland of statewide importance	1150
3200	Johnstown fine sandy loam, 0 to 2 percent slopes	Prime farmland if irrigated	4460
3201	Johnstown loam, 0 to 2 percent slopes	Prime farmland if irrigated	16430
3202	Johnstown loam, 2 to 6 percent slopes	Prime farmland if irrigated	660
3260	O'Neill fine sandy loam, 0 to 2 percent slopes	Farmland of statewide importance	3020
3264	O'Neill loam, 0 to 2 percent slopes	Farmland of statewide importance	1050
3267	O'Neill sandy loam, 0 to 2 percent slopes	Farmland of statewide importance	740
4370	Libory loamy fine sand, 0 to 3 percent slopes	Farmland of statewide importance	2770
4730	Sandose loamy fine sand, 0 to 3 percent slopes	Farmland of statewide importance	3440
5286	Vetal loam, 1 to 3 percent slopes	Prime farmland if irrigated	710
6640	Boelus loamy sand, 0 to 3 percent slopes	Farmland of statewide importance	1100
9001	Anselmo fine sandy loam, 0 to 3 percent slopes	Prime farmland if irrigated	1530
9004	Anselmo fine sandy loam, 3 to 6 percent slopes	Prime farmland if irrigated	2030
		Total (acres)	51,170

Source: U.S. Department of Agriculture (USDA). Web Soil Survey. Last updated September 2019.

Figure 3-2. Prime and Unique Farmland and Farmland of Statewide Importance



Source: U.S. Department of Agriculture (USDA). Web Soil Survey. Published September 2019.

3.3 Water Quality

Surface Water. The 2020 Nebraska Water Quality Integrated Report (IR) is used to establish a priority ranking of perennial streams based on water quality and beneficial uses. The IR defines multiple categories of waterbodies to help present information in a complete, descriptive manner.

These categories include the following:

- Category 1. Waterbodies where all designated uses are met.
- Category 2. Waterbodies where some of the designated uses are met but there is insufficient information to determine if all uses are being met.
- Category 3. Waterbody where there is insufficient data to determine if any beneficial uses are being met.
- Category 4. Waterbody is impaired, but a total maximum daily load (TMDL) is not needed.

- Category 5. Waterbody where one or more beneficial uses are determined to be impaired by one or more pollutants and all of the TMDLs have not been developed. Category 5 waters constitute the Section 303(d) list subject to Environmental Protection Agency (EPA) approval/disapproval.

Portions of Long Pine Creek, Bone Creek, and Sand Draw are listed as Category 5 waters in the 2020 IR (Figure 3-3). These streams are listed on the State's 303(d) list due to their high levels of E. Coli bacteria and Sand Draw and Bone Creek are additionally listed for elevated temperatures. A separate reach of Long Pine Creek is listed as Category 4a with impaired water quality due to high E. Coli levels but has met all required TMDLs.

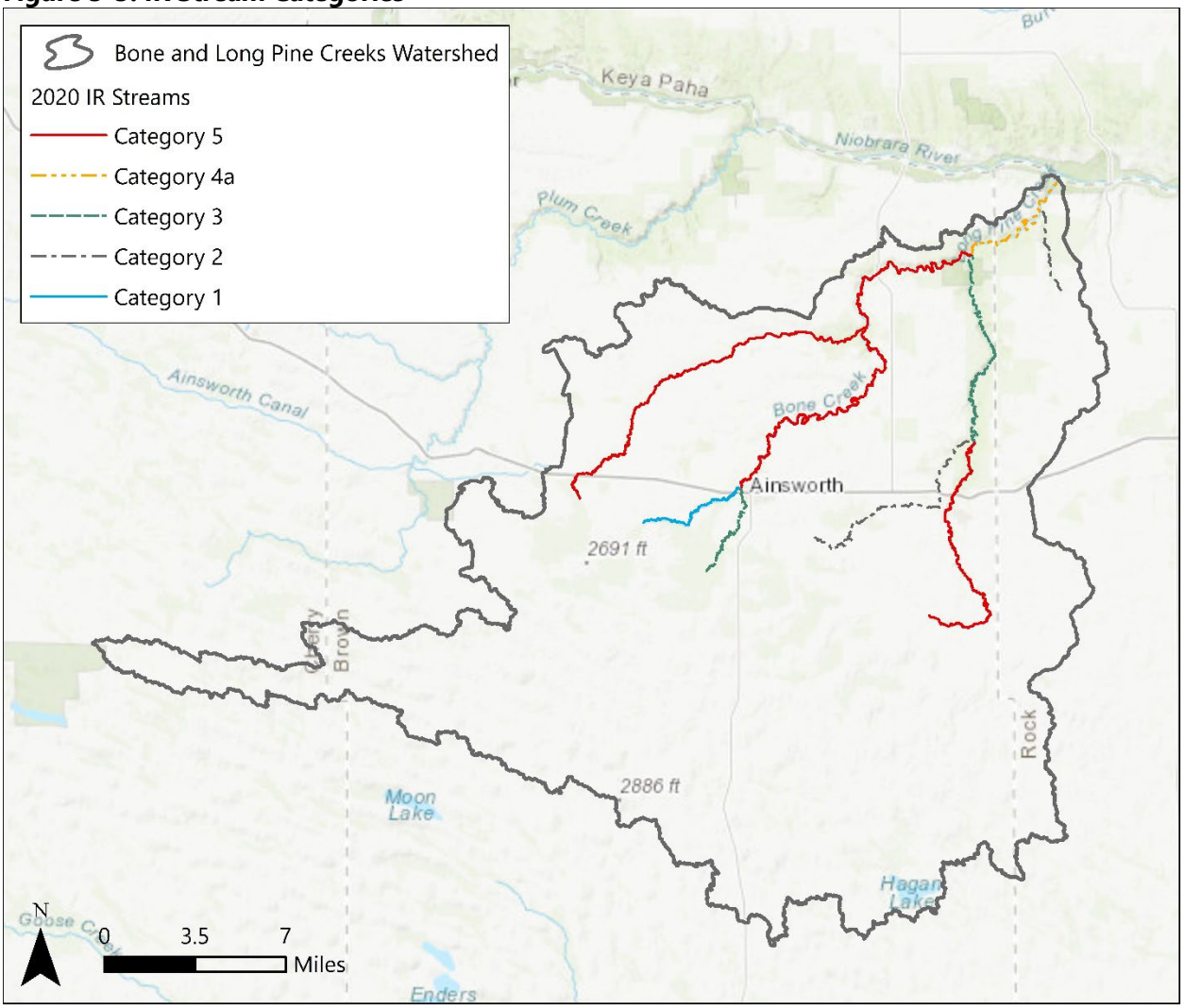
Beneficial uses are designated for perennial streams and can include the following:

- Primary Contact Recreation
- Aquatic Life: Coldwater (Class A and B), Warmwater (Class A and B)
- Water Supply: Public Drinking Water, Agriculture, Industrial
- Aesthetics

Five stream segments included in the 2020 IR have Primary Contact Recreation beneficial use, which means they are used, or have a high potential to be used, for recreational activities where the body may come into prolonged contact with the water. All streams from the 2020 IR within the watershed are classified as either Class A or Class B Coldwater Aquatic Life. The Class A Coldwater classification means that they can support natural reproduction of a salmonid (trout) population and are capable of maintaining year-round populations of a variety of other coldwater fish. The Class B Coldwater Aquatic Life classification means that they have or could have a habitat capable of maintaining a variety of coldwater fish but are not supportive of natural reproduction of trout.

All 2020 IR waters within watershed are classified for Class A Agriculture Water Supply due to their potential for general agricultural uses such as irrigation and livestock watering without treatment. These waters are also protected for an Aesthetic Beneficial Use, meaning they must be free from human induced pollution which causes noxious odors, floating, suspended, colloidal, or settleable materials that produce objectionable film, colors, turbidity, or deposits, and the occurrence of undesirable or nuisance aquatic life such as algal blooms (NDEE 2020).

Figure 3-3. IR Stream Categories



Nebraska Department of Environment and Energy. 2020 Water Quality Integrated Report. May 2020.

Groundwater. In Nebraska, groundwater is located within voids in layers of geologic material. Groundwater is an essential resource within the watershed, which currently has approximately 960 active registered wells (NDNR 2020). Of the active registered wells, there are 360 irrigation wells, 320 livestock wells, and 180 domestic wells. Other types of active registered wells include aquaculture, commercial/industrial, injection, monitoring, and observation wells. The groundwater depth within the watershed varies due to the variance in topography in the Sandhills, but is overall relatively shallow, which means that its water quality is more at risk from contamination.

Groundwater has been found to have high nitrate concentrations in irrigated areas. Management Zones were created in the MNNRD Groundwater Management Plan (GWMP 1995) to address the groundwater nitrate contamination. Approximately half of the watershed is located within the GWMP Management Zone 3, which is characterized by 50 percent or more of the wells monitored by the MNNRD having nitrate levels above 5 parts per million (ppm). Land within the GWMP Management Zone 3 is subject to rules and regulations that includes a mandatory fertilizer applicator certification course to all persons who apply any

type of fertilizer on more than five acres of land within the management zones, adopting two or more best management practices (BMPs) from an approved list, and soil testing. In a 1993-94 U.S. Geological Survey (USGS) Water Resources Investigations Report (USGS Report), nitrate concentrations in the ground-water samples ranged from 0.5 to 32 ppm with the larger concentrations located in wells with high groundwater tables in areas of irrigated agriculture. It was also found that larger concentrations of sulfate, chloride, and nitrate concentrations are in the shallow observation wells near irrigated agriculture.

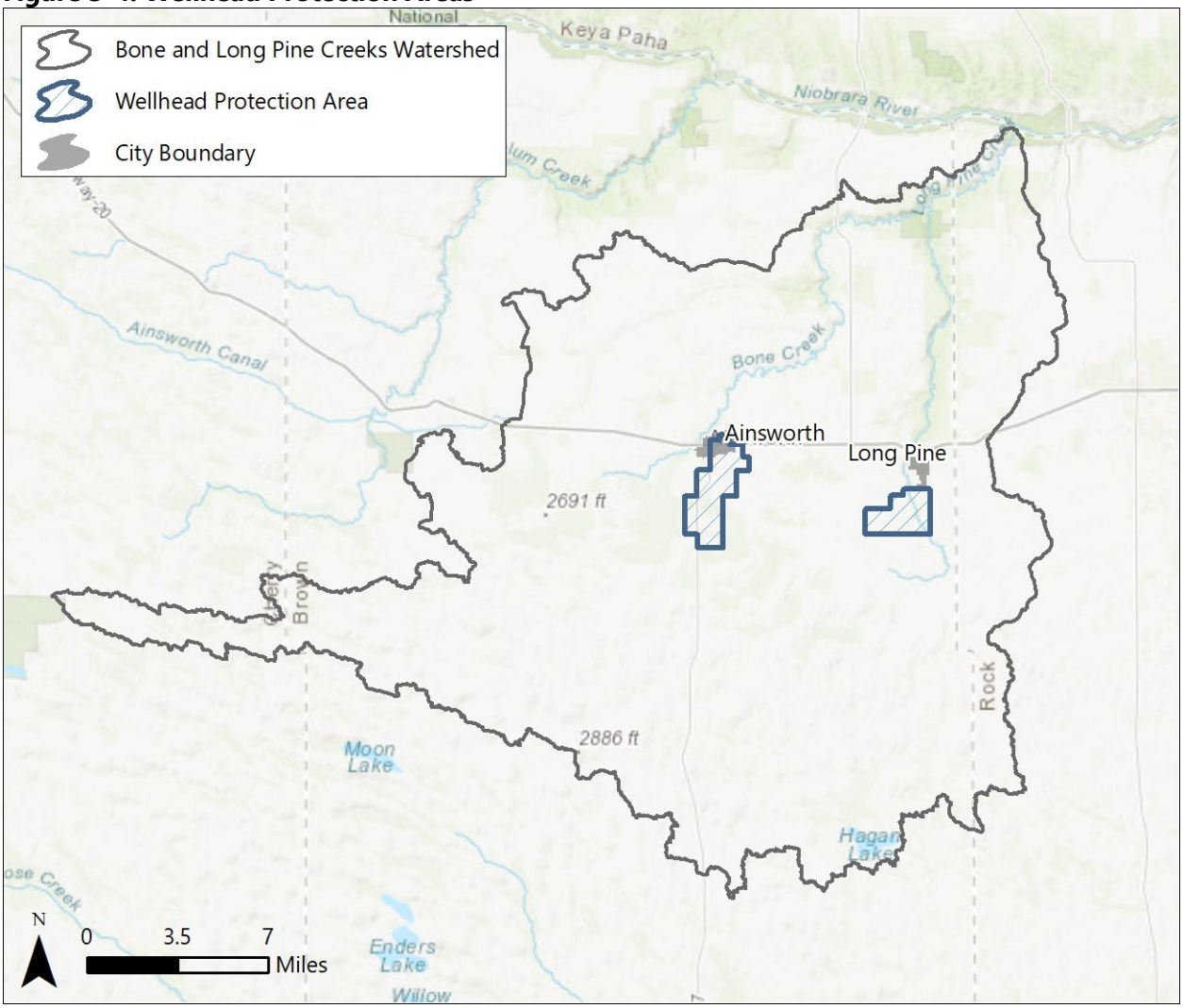
3.4 Water Quantity

Surface Water. The watershed is experiencing additional water due to the relocated water from the Merritt Reservoir into the watershed for irrigation purposes. The additional surface water brought in for irrigation results in greater runoff and baseflow within streams. The Ainsworth Unit redirects, on average, approximately 102,000 acre-feet of water each year to provide irrigation to farmlands located predominantly within the watershed. This additional volume has resulted in problems to the stream systems including erosion and degradation, excess pollutants in the water, and alteration of stream types. Sand Draw is a perennial stream that was ephemeral prior to the 1960s, when the Ainsworth Unit imported irrigation water into the watershed.

Groundwater. The High Plains aquifer, also known as the Ogallala aquifer, is the principal aquifer within the watershed and under normal conditions provides an ample supply of high-quality groundwater. Groundwater generally moves towards the southeast, except near the Niobrara River, which moves toward the river. Groundwater is estimated to move between 5- and 500-feet each year. Water supplies for industrial and domestic purposes are dependent on groundwater in Nebraska and groundwater levels have remained relatively constant since pre-development within the watershed (UNL 2013). According to a simulation of groundwater flow study between 1895 – 2010 (USGS 2018), it is estimated that the Ainsworth Canal recharges approximately 18,900 acre-feet of water through the unlined portion of the canal each year during irrigation season. Some areas have experienced artificially raised groundwater levels up to approximately 10- to 20-feet (WQMP 2016), largely due to the imported irrigation water. However, the trend over the last 20 years has been slightly to moderately downward, depending on location (see Appendix D).

A wellhead protection network was created as a voluntary program to help communities protect their public water through delineating Wellhead Protection Areas (WPAs). Wellhead protection areas are protected zones around groundwater wells that supply water to the public water system and are protected from potential contaminants to the water. There are two wellhead protection areas within the watershed to protect the water supplies to the cities of Long Pine and Ainsworth (Figure 3-4).

Figure 3-4. Wellhead Protection Areas



3.5 Regional Water Management Plans

The Long Pine Creek Watershed Water Quality Management Plan (2016 WQMP). The Long Pine Creek Watershed WQMP (that includes the same watershed limits as this Plan-EA) was approved in March 2016 and was considered during the scoping process. The WQMP was created with the goal to protect or restore the quality of the water resources within the watershed and guide the Sponsor in the development and implementation of future projects. The EPA's "Nine Elements of a Successful Watershed Plan" and a community planning approach supported by NDEE was used to guide the development of the WQMP.

Middle Niobrara NRD Ground Water Management Plan (1995 GWMP). The GWMP was approved by the NDNR in 1995 and provides mostly qualitative management of ground water. The management includes Management Zones to maintain the groundwater level at the present level within the natural historical fluctuations.

Middle Niobrara NRD Integrated Management Plan (2020 IMP). The 2020 IMP was developed to balance the use and supply of surface water and groundwater for economic and health, safety, and welfare purposes. The goal of the 2020 IMP is to protect the water supplies to sustain its benefits into the future.

Nebraska Long Pine Creek Rural Clean Water Program, 10 Year Report (1991 RCWP). The watershed was selected as one of 21 watersheds within the United States for the experimental Rural Clean Water Project (RCWP) in 1981. The 1991 RCWP 10-year report documents the development, findings, recommendations, and the results of the implemented BMPs applied to the watershed through the experimental RCWP.

3.6 Wetlands

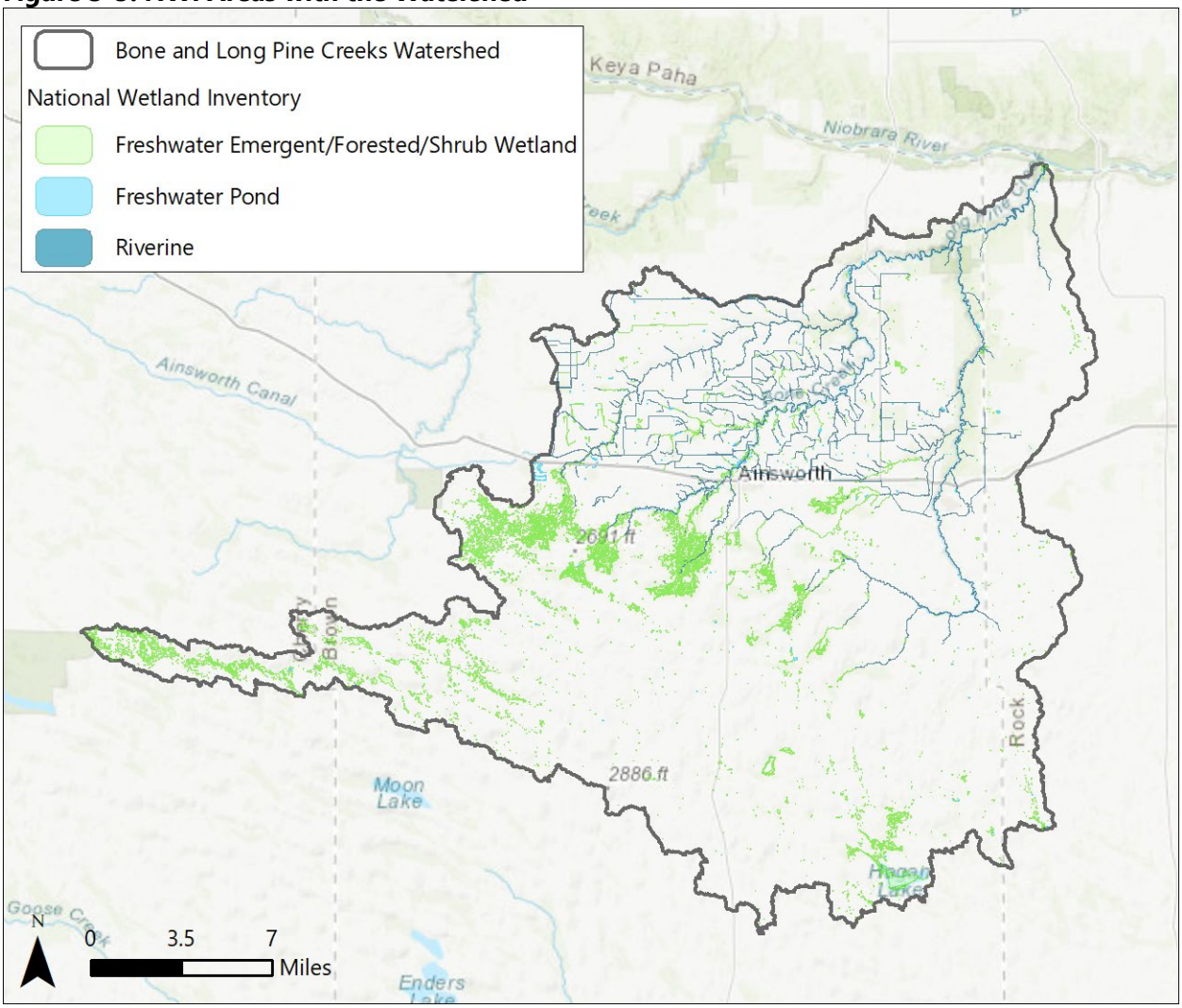
The USFWS National Wetlands Inventory (NWI) provides detailed information on the abundance, characteristics, and distribution of wetlands within the United States. There are approximately 7,410 acres of NWI areas within the Bone and Long Pine Creeks watershed, which makes up approximately 2 percent of the total watershed. Approximately 82 percent of these NWI areas are freshwater emergent wetlands. The acreage within the watershed of each type of wetland and the Cowardin classification (as classified by the NWI) are included in Table 3-3 below and shown in Figure 3-5.

Table 3-3. NWI Areas within the Watershed

Wetland Type	Cowardin Classification	Area (ac)
Freshwater Emergent Wetland	Palustrine emergent, temporarily flooded	2,830
	Palustrine emergent, seasonally flooded	2,600
	Palustrine emergent, semi-permanently flooded	690
	Subtotal	6,110
Freshwater Forested/Shrub Wetland	Palustrine forested, temporarily flooded	20
	Palustrine scrub-shrub, temporarily flooded	10
	Subtotal	30
Freshwater Pond	Palustrine aquatic bed, semi-permanently flooded	170
	Palustrine unconsolidated bottom, semi-permanently flooded	50
	Palustrine unconsolidated shore, temporarily flooded	10
	Palustrine unconsolidated shore, seasonally flooded	30
	Subtotal	250
Riverine	Riverine streambed, seasonally flooded	660
	Riverine streambed, temporarily flooded	90
	Riverine unconsolidated bottom, permanently flooded	210
	Riverine unconsolidated bottom, semi-permanently flooded	20
	Riverine unconsolidated bottom, seasonally flooded	50
	Subtotal	1,020
Total		**7,410**

Source: *U.S. Fish and Wildlife Service (USFWS). National Wetlands Inventory. NE Wetlands East. Last updated October 2018.*

Figure 3-5. NWI Areas with the Watershed



Source: *U.S. Fish and Wildlife Service (USFWS). National Wetlands Inventory. NE Wetlands East. Last updated October 2018.*

Wetlands delineations were performed within each of the identified Tier 1 Affected Resource Areas (ARAs) to determine locations of wetlands as defined and protected by the Clean Water Act (CWA), Food Securities Act (FSA), and the NDNR. ARA locations are shown in Figure 4-4 and results of these delineations are shown in Figures C3.1 through C3.12A in Appendix C.

3.7 Streams

Long Pine Creek, Willow Creek, Bone Creek, and Sand Draw are the major streams within the watershed, shown in Figure 3-6 and detailed in Table 3-4.

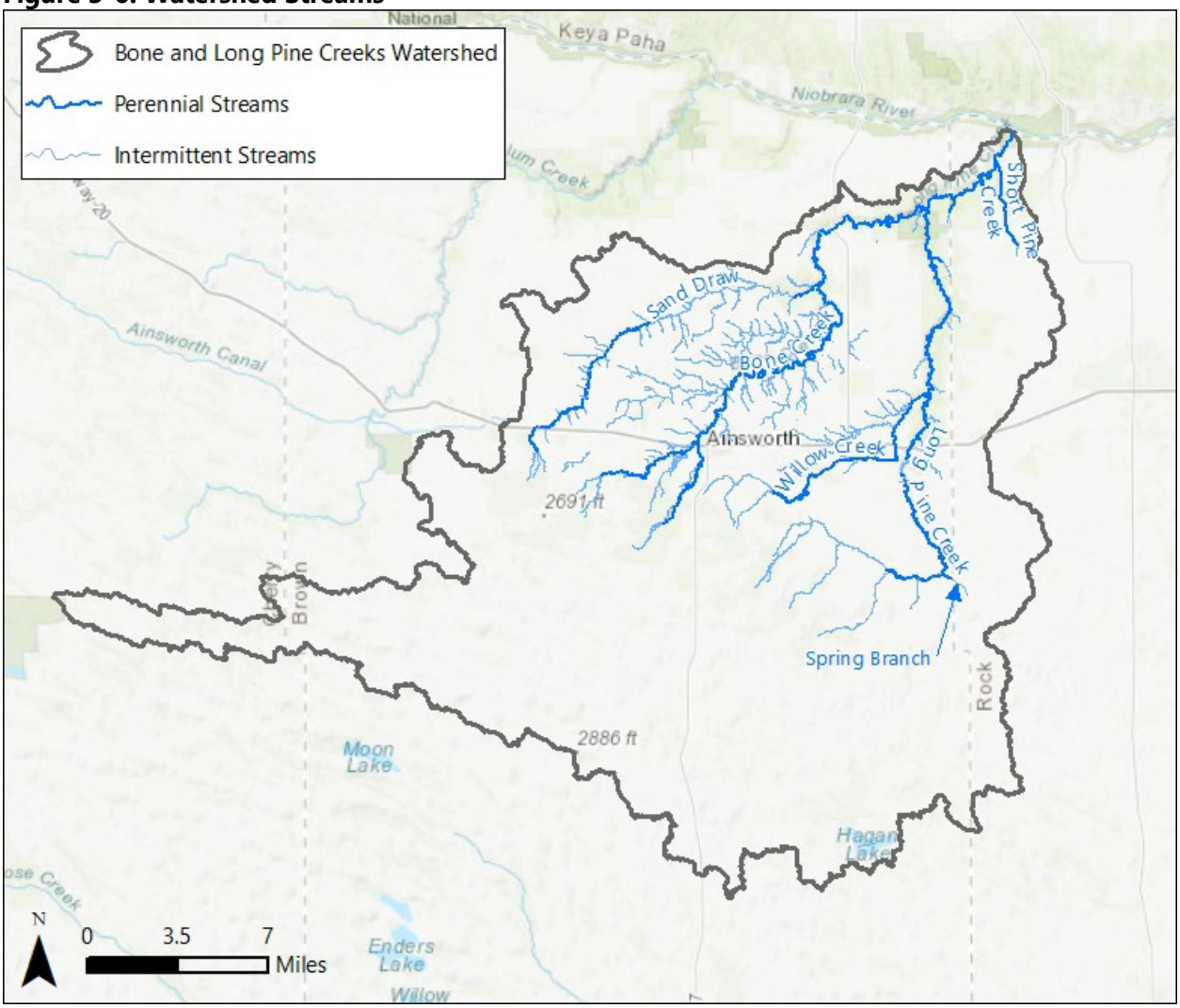
Table 3-4. Stream Lengths within the Watershed

Stream	Drainage Area (mi2)	Length (ft)
Long Pine Creek	519	222,020
Short Pine Creek	22.8	22,460
Willow Creek	36.2	74,030

Stream	Drainage Area (mi2)	Length (ft)
Bone Creek	169.1	200,620
Sand Draw	57.3	119,480
Spring Branch	46.2	7,030

Source: USGS, National Hydrography Dataset (NHD). Published November 2019.

Figure 3-6. Watershed Streams



Source: USGS, National Hydrography Dataset (NHD). Published November 2019.

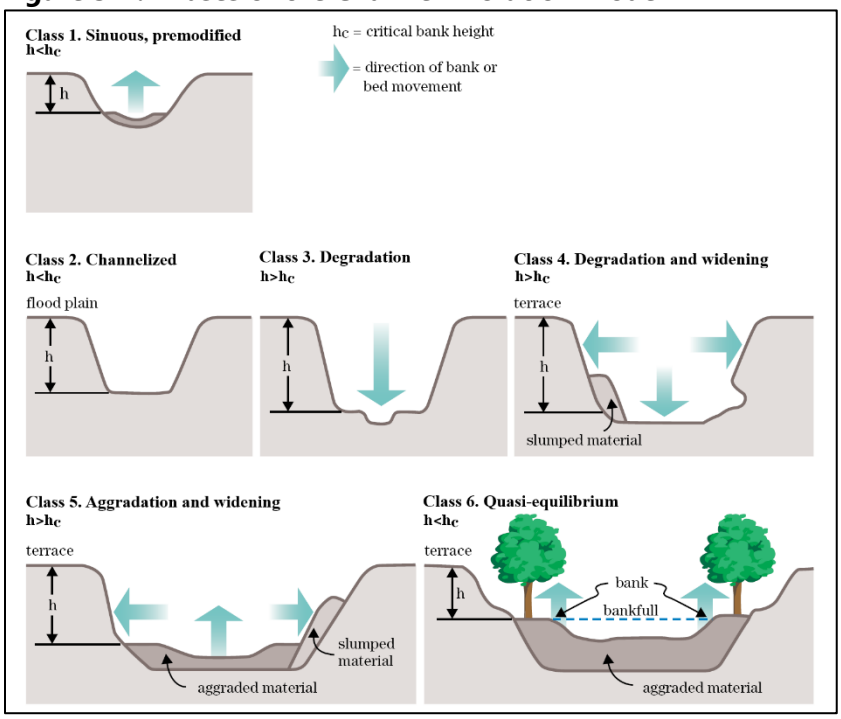
Field reconnaissance and desktop review were used to assist in classifying the streams within the watershed.

The soils within the watershed are quite varied depending on the location and exhibit significant variation with depth. The youngest deposits include unconsolidated fine sands and gravel which freely erode and form available bedload within the streams. As the streams cut deeper into the valley, multiple strata become visible, including loosely consolidated sandstone as well as finer-grained siltstone. In terms of erosion resistance, the fine-grained siltstone will likely be the most resistant formation, followed by loosely consolidated sandstone, silty-clays, and finally sands. The streams appear to have downcut into these formations previously in the lowest reaches of Long Pine Creek, and various altered deposits are visible in

some segments likely sourced from adjacent bank failures and upstream sediment transport. In the upper reaches, sands are still the predominant bed material with silty-clay or clay-loam lenses making a limited appearance in short segments of the stream. These clay lenses are less erosive compared to the unconsolidated sands and tend to form much higher stream slopes with resulting higher average channel velocity.

Fluvial geomorphology is the study of the interaction between the physical form of rivers and the landforms around them both with and without human-induced changes to a watershed. The continual stream process of destabilizing and then moving towards dynamic equilibrium (or quasi-stability) has been described and characterized through a sequence of channel forms by many researchers in fluvial geomorphology and has been termed the 'channel evolution model' (CEM). One of the most popular models is the six-phase model by Simon and Hupp (Simon and Hupp 1986) which has been adapted by many others, including the USACE Regulatory Division (Omaha District) in their Nebraska Stream Conditions Assessment Protocol (NeSCAP) (USACE 2017). The CEM identifies multiple idealized stream phases or classes to describe the channel evolution process. Cross sectional views of these classes are shown in Figure 3-7. These phases do not represent streams at each minor form change or over the continuum of stream change. Instead, they represent discrete stages characterized by the dominance of a specific adjustment process that allows interpretation of past, present, and future processes (Simon and Rinaldi 2006). This makes the CEM methodology ideal for visually identifying and predicting stream characteristics in a changing watershed.

Figure 3-7. Phases of the Channel Evolution Model



Source: Adapted from NRCS, 2010 and Simon

Class 1 represents a pre-disturbance condition where the stream is connected to the floodplain, well-vegetated, and sinuous. Streams of this type are found within the headwaters of every major stream within the watershed (Figure 3-8). Land use changes from natural prairies to agricultural development, as well as

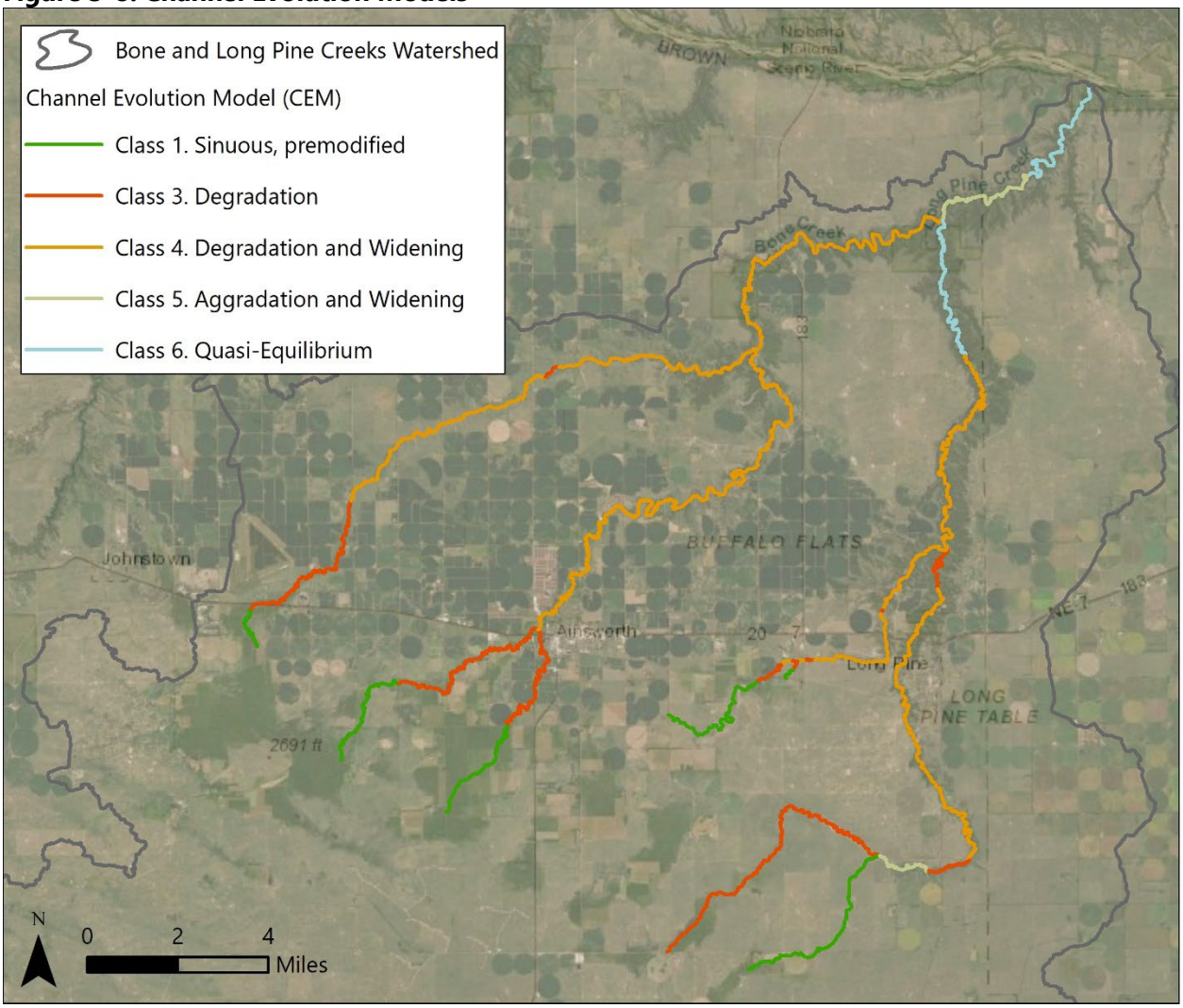
degradation due to increased groundwater/ baseflow, stream slope moderation, headcut progression, and major flood events all lead to streams evolving to other phases.

Class 2 shows the beginning of stream disequilibrium, generally brought on by an excess in stream power (USACE 2016) due to channelization. Although watershed-wide stream channelization and straightening is not prevalent, localized stream channelization and straightening could have induced Class 2 conditions in the past. Class 2 conditions are rarely found within the watershed as streams move quickly into Class 3 due to low resistance to erosion at the channel bed.

Class 3 streams exhibit streambed degradation and are prevalent within the middle reaches of the watershed. Banks are approaching or have reached critical bank height. Class 3 streams are generally prevalent as tributaries to the major streams within the watershed. Stream widening due to toe erosion and/or mass wasting of the stream banks as they exceed stable bank height generally occurs after a high-velocity flow event and the streams move into a Class 4 stream. Class 4 streams show signs of degradation and widening and represent the most stream-miles within the watershed. Massive stream widening has occurred in the lower reaches of Sand Draw and Bone Creeks.

Class 5, aggradation, can be present within the watershed and is currently seen near the headwaters of Long Pine Creek due to high overland erosion in the area and the major flood events of 2019. A small section of Class 5 stream is also present downstream of the confluence of Bone Creek and Long Pine Creek. Class 6 represents a channel moving back to a quasi-equilibrium state and moving towards stabilization. This would occur when a stable stream profile is reached and the slumped bank material acts as the new channel bed. A new low-flow channel forms along the new channel bed and a floodplain is created below the original floodplain elevation, with the previous floodplain now acting as a terrace. Class 6 streams are seen in the downstream reaches of the watershed on Long Pine Creek.

Figure 3-8. Channel Evolution Models



Stream delineations and functional assessments utilizing the NeSCAP, and the Stream Visual Assessment Protocol Version 2 (SVAPV2) were performed within each of the identified Affected Resource Areas (ARAs). ARA locations are shown in Figure 4-4, results of the stream delineations are shown in Figures C3.1 through C3.12A (Appendix C), functional assessment reach locations are shown in Figures C5 – C5E (Appendix C), and functional assessment results are included Appendix E.

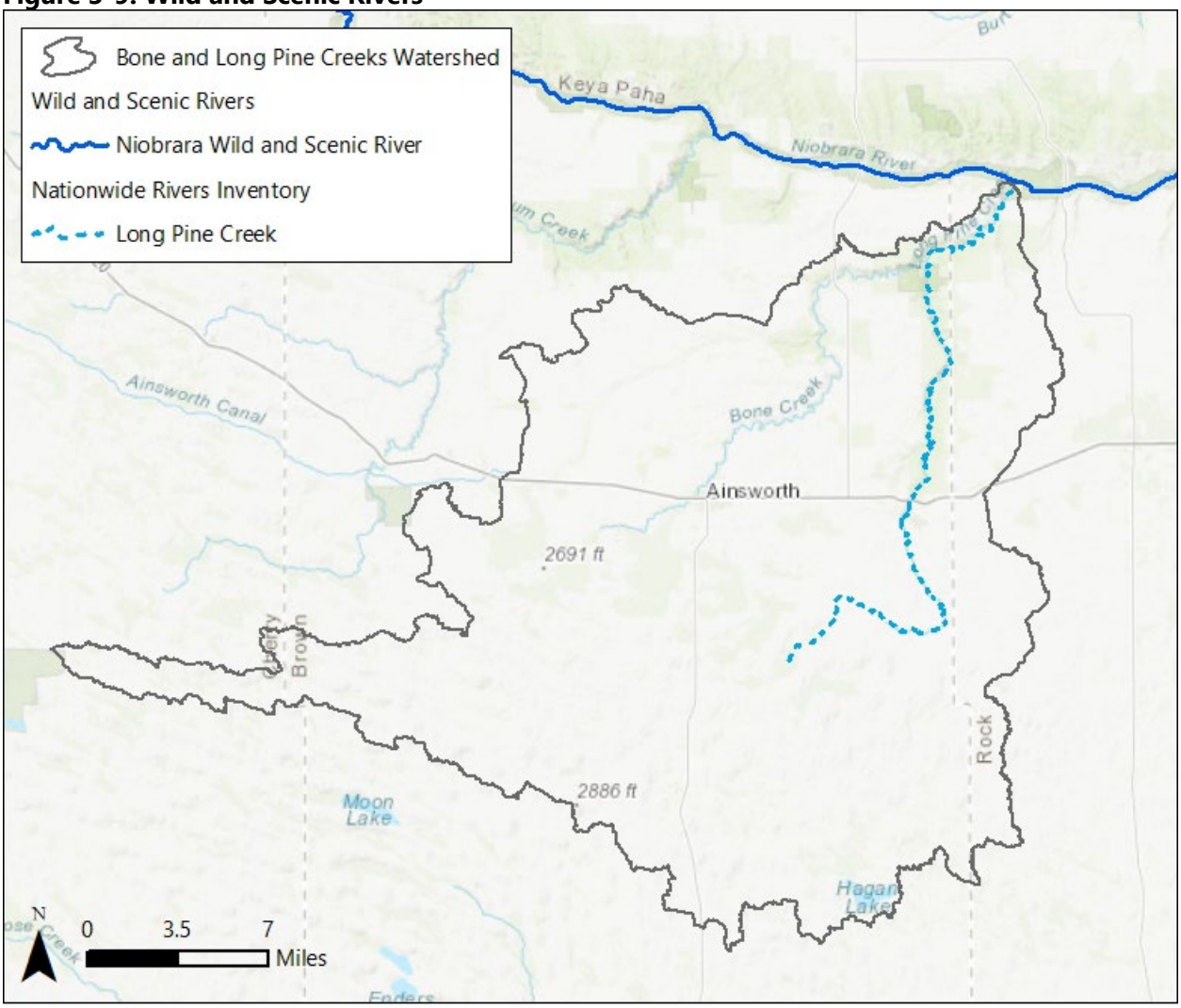
3.8 Wild and Scenic Rivers

Congress created the National Wild and Scenic Rivers System (NWSRS) in 1968 to preserve free-flowing rivers with outstanding natural, cultural, and recreation values. This watershed drains directly into the Niobrara Wild and Scenic River, which is a federally administered river and classified as scenic. The NWSRS defines Scenic River Areas as those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads. The Wild and Scenic Rivers Act defines outstandingly remarkable values as the characteristics of a river worthy of special protection and national recognition. These values for the Niobrara River include outstanding and remarkable fish, geology, recreation, scenery, wildlife, and paleontology. Wild and Scenic

Rivers are managed by the federal agencies that manage the land through which they flow and the National Park Service, Niobrara National Scenic River is the managing agency for this river.

The Nationwide Rivers Inventory (NRI) contains additional river segments that are not classified as wild and scenic but are believed to possess one or more "outstandingly remarkable" values. Long Pine Creek within the watershed is listed as a highest-priority fishery resource as an important trout fishery. The river mouth empties directly into the Niobrara Wild and Scenic River. The extents of the wild and scenic and NRI rivers are shown in Figure 3-9 below.

Figure 3-9. Wild and Scenic Rivers



Source: National Wild and Scenic River System, National Wild and Scenic River Segments. Published March 2016. US National Park Service. Nationwide Rivers Inventory. Published January 2016.

The identified Affected Resource Areas (ARAs), shown in Figure 4-4, are not located along the Niobrara River or along the NRI portion of Long Pine Creek. Although not within the designated river corridor, they are on tributaries to the Niobrara River and would therefore require a Section 7(a) determination. See Section 5.8 for more detailed information.

3.9 Threatened, Endangered, and Sensitive Species

The Endangered Species Act of 1973 provides a framework to conserve and protect threatened and endangered (T&E) species, and their habitats while the Fish and Wildlife Coordination Act of 1934, as amended through PL 116-188 and enacted in 2020, which directs the USFWS to investigate and report on proposed Federal actions and provide recommendations to minimize impacts on fish and wildlife resources.

On April 18, 2023, both the US Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) Tool and the Nebraska Game and Park Commission's (NGPC) Conservation and Environmental Review Tool (CERT) were run to determine the initial list of species with habitat ranges that intersect the boundaries of the watershed. In total, 14 species were identified including: Northern Long-eared Bat, Piping Plover, Pallid Sturgeon, Monarch Butterfly, American Burying Beetle, Blowout Penstemon, Whooping Crane, Finescale Dace, Northern Redbelly Dace, Small White Lady's Slipper, Western Prairie-Fringed Orchid, Interior Least Tern, Eastern Black Rail, and the Rufa Red Knot. Tier 1 and Tier 2 aquatic species of concern that inhabit streams within this watershed were also identified.

Additionally, eight species are undergoing review, and are subject to re-classification before the project moves into the implementation phase. Those species include:

- Tricolored Bat (*Perimyotis subflavus*)- Currently a federally proposed endangered species.
- Plains Spotted Skunk (*Spilogale subflavus*)- Currently a federally proposed species.
- Regal Fritillary (*Speyeria idalia*)- Currently a federally proposed species.
- Sturgeon Chub (*Macrhybopsis gelida*)- Currently a state-listed endangered species, and a federally proposed species.
- Blanding's Turtle (*Emydoidea blandingii*)- Currently a federally proposed species.
- Lake Sturgeon (*Acipenser fulvescens*)- Currently a State-Listed threatened species, and a federally proposed species.
- Western Bumble Bee (*Bombus occidentalis*)- Currently a federally proposed species.
- Golden-Winged Warbler (*Vermivora chrysoptera*)- Currently a federally proposed species.

Below are the suitable habitat descriptions for each of the species listed in the opening section paragraph based off of information gathered from IPaC and CERT reports:

<u>Northern Long-eared Bat *(Myotis septentrionalis)* – Federally and State Endangered (as of March 31st, 2023)</u>
This medium-sized bat is approximately 3 to 4 inches in length with a wingspan of 9 to 10 inches and is distinguished by its long ears, particularly as compared to other bats in its genus. Their fur color can be medium to dark brown on the back and tan to pale brown on its underside. These bats spend winters hibernating in caves and mines (called hibernacula) with constant temperatures, high humidity, and no air currents. During the summer, they roost either singly or in colonies underneath bark, in cavities or in crevices in both live and dead trees, and within structures like barns, sheds, and culverts.

Pregnant females spend summer months roosting in small colonies generally composed of 30 to 60 bats at the beginning of summer. Females will give birth to one single pup, which may occur from late May to late July. The predominant and most immediate threat to the Northern long-eared bat is white-nose syndrome, a fungal disease that affects hibernating bats. This fungus causes changes in bats that make them more active than usual and in turn they burn up fat needed to survive the winter.

Piping Plover (*Charadrius melodus*) – Federally and State Threatened

The piping plover is about 7¼ inches with a 19-inch wingspan and can live up to 8 to 11 years, however, most do not live past one year. These birds are sand colored with white undersides, orange legs, and black bills. Adults develop an orange bill with a dark tip, black forehead band, and breast band during breeding season. These birds forage on mud and sand substrates and consume mostly beetles and small soft-bodied invertebrates.

Piping plovers arrive in Nebraska in mid- to late-April on the lower reaches of major rivers for breeding. Their breeding season is three to four-months long and the remaining eight to nine months of the year are spent on their wintering grounds along the Gulf of Mexico and southern Atlantic Coast. During the breeding period, females place their eggs in depressions within the sand and typically lay around four eggs. Both parents are responsible for incubating the eggs during the 27-to-31-day incubation period.

Western Prairie Fringed Orchid (*Platanthera praeclara*) – Federally and State Threatened

This orchid is a native perennial forb distinguished by large, white flowers on a single stem that grows up to three-feet high. Each flower stalk has up to 40 flowers that have fringed margins and are approximately one inch long. It was historically found throughout the tallgrass regions of central United States and grows in wet to drier prairies. Habitat includes wet to moist soils in unplowed tallgrass prairies and meadows as well as bogs, fens, and sedge meadows. It can also be found in the sandy sub-irrigated meadows in the Sandhills.

The greatest threat to the western prairie fringed orchid is habitat loss, predominantly through the conversion of habitat for crop production, grazing, intensive haying, and drainage. Additional threats include overuse of herbicides, livestock overgrazing, and other detrimental practices to native prairies.

American Burying Beetle (*Nicrophorus americanus*) – Federally and State Threatened

The USFWS is currently proposing to downlist the American burying beetle from endangered to threatened under the Endangered Species Act. This beetle can be up to two inches long and is the largest member of the Silphidae Family (carrion beetles) in North America. Carrion beetles are characterized by using dead animals for food and reproduction by feeding and laying eggs on dead animals, helping to recycle dead animals back into the ecosystem. The beetles are shiny black with orange spots on it wings covers, on its head between the eyes, and on the pronotum (the hard covering behind the head). This species is nocturnal and spends most of their its flying in search of dead animals and burying carcasses to hide from other carrion beetles and scavengers.

This species has been eliminated from nearly 90 percent of their original range and the Nebraska Sandhills is a major home to the remaining species. Their habitats include open woodlands, prairies, scrubland, and forest edges and tend to inhabit large, intact areas with little human disturbance. Adult beetles reproduce

in early summer and lay 10 to 30 eggs in an underground chamber above their buried carcass. The young larvae feed on the carcass and receive parental care the entire time they feed and grow.

Blowout Penstemon (*Penstemon haydenii*) – Federally and State Endangered

This perennial plant is also known as Hayden's penstemon and grows to be one to two feet tall. It has waxy, greenish-blue leaves that are three to five inches long and clusters of four to six lavender and tubular flowers. This plant is scattered throughout the central part of the Nebraska Sandhills and are found in open sand habitats called blowouts. Blowouts are wind excavated depressions on the top of dunes, historically caused by the burns and grazing that removed the grass cover. This habitat is relatively uncommon due to the reduced blowouts from well-established Sandhills grasslands.

Whooping Crane (*Grus americana*) – Federally and State Endangered

This crane is only found in North America and is the tallest bird in North America when standing upright, at five feet tall. The adult whooping crane is mostly white except for black primary feathers, a red face and crown, an olive-gray bill, and gray-black colored legs and feet and young cranes have a red color. The crane makes a loud, single-note sound when alarmed and can live up to 30-years. These birds are omnivores and eat insects, frogs, small birds, minnows, and berries in the summer and mostly blue crabs and clams in the winter. This crane is a migratory bird that breeds in the same general area each year in Canada between April and September. Whooping cranes migrate solo, in pairs, in family groups, or in small flocks and stop regularly to rest and feed. The whooping cranes fly through Nebraska in the spring and fall on their way between the breeding site in Canada and their wintering sites in Texas.

Pallid Sturgeon (Scaphirhynchus albus) – Federally and State Endangered

Pallid sturgeons are bottom dwelling, slow growing fish that feed primarily on small fish and immature aquatic insects. They have a flattened snout, long slender tail, and are armored with rows of bony plates. While seldom seen, the fish can reach lengths of 6 feet and weights of 80 pounds. Pallid sturgeons are adapted to the bottoms of large, silty rivers, and prefer a diversity of depths and velocities provided by braided channels and sandbars. The fish are long-lived and slow growing, with females reaching reproductive age around 7-15 years, and up to 10-year intervals between spawning.

Finescale Dace (*Chrosomus neogaeus*) – State Threatened

This fish ranges from two to five inches long with a brown-gray back, dark orange stripe along its back, and tiny scales. In Nebraska, this fish is found throughout the northern Sandhills and the Niobrara River and typically inhabit small, slow-moving streams. They are sight-feeders so need clear waters and therefore, prefer sand and gravel-lined creeks. This species spawns between April and June and reproduce in covered depressions in the sand.

Interior Least Tern (*Sternula antillarum athalassos*) – State Endangered

The interior least tern is a feisty, swallow-like bird 8 to 9 inches long with a wingspan of 20 inches. It is the smallest tern species in North America. It was once called sea swallow for its delicate, graceful, and buoyant flights over water. During the breeding season, least terns typically nest and raise young on dry riverine sandbars in wide, braided rivers, and along the shores of reservoirs and lakes. They can also be found nesting on sand and gravel piles at mining operations near rivers.

Adult least terns have a black crown, white forehead and undersurface, pale gray back and wings, and a black-tipped yellow-orange bill. The short legs and webbed feet of the male are orange while the females are pale yellow. The long, black outermost wing feathers and the short, deeply forked tail are conspicuous in flight. Immature least terns are darker gray than the adults and have a dark bill, a dark gray eye stripe, a white forehead, and a dusky brown cap.

Northern Redbelly Dace (*Chrosomus eos*) – State Threatened

This fish ranges from two to five inches long and has an olive-brown colored back, two dark bands along its side and tiny scales. In Nebraska, this fish is located throughout the western half of the Sandhills and typically inhabit small, slow-moving streams. They are sight-feeders so need clear waters and therefore, prefer sand and gravel-lined creeks. This species spawns from May to August and use vegetated habitats for fertilization and laying eggs.

Small White Lady's Slipper (*Cypripedium candidum*) – State Threatened

This native perennial plant grows between 4 to 14 inches high with two to four long and slender leaves on the top half of the steam. One flower per stem forms between mid-May to mid-June. It has an inflated lower lip of the flower creating a white to pale purple pouch and a bright yellow upper lip. This flower inhabits wet meadows and moist prairies in deep soils with full sunlight. They are not present in disturbed prairies from livestock grazing or agriculture.

Eastern Black Rail (*Laterallus jamaicensis*) – Federally and State Threatened

This marsh bird is 10 to 15 centimeters long with a 22- to 28-centimeter-long wingspan. They are generally pale to blackish gray with bright red eyes. In the interior United States these birds typically inhabit wet sedge meadows with dense covers or shallow wetlands dominated by cattails. It faces threats from habitat loss from alteration and loss of wetland habitats, inappropriately timed fire applications, high density grazing, and mowing during the breeding season.

Rufa Red Knot (Calidris canutus rufa) – Federally and State Threatened

The rufa red knot is a stocky, robin-sized shorebird with relatively short bill and legs, and a wingspan of approximately 20 inches. The birds have a proportionately small head, small eyes, and short neck, and a black bill that tapers from a stout base to a relatively fine length. The rufa red knot is easily recognized during the breeding season by its distinctive red plumage. Nonbreeding season plumage is dusky or pale ashy gray above, with feathers on back narrowly edged in white. The birds prefer coastal marine and estuarine habitats with large areas of exposed intertidal sediments. The birds annually migrate between the far north of the central Canadian Arctic to the extreme south of Tierra del Fuego, making them one of the longest-distance migrants in the animal kingdom.

Monarch Butterfly (Danaus plexippus) – Candidate Federally Threatened

Monarch butterflies are large and have bright orange wings with a black outline and black veins. Monarchs lay their eggs on milkweed host plants during the breeding season and the larvae feed on the milkweed plants. Adult monarch butterflies pollinate many flowering plants. Monarchs migrate to warmer areas for the winter.

The loss of milkweed and habitat has been the biggest threat to this species. The cutting of fir forests is an additional threat to monarchs' wintering sites. Use of insecticides and herbicides have been linked to the declining monarch butterfly population.

Plains Topminnow (*Fundulus sciadicus*) – Tier 1 At-risk Species
The Plains Topminnow are small fish that feed on insects at or just beneath the water surface. This species inhabits shallow, heavily vegetated, and slow-moving streams and are typically found within small and clear streams in the headwaters of the watershed.

Western Silvery Minnow (*Hybognathus argyritis*) – Tier 1 At-risk Species
The Western Silvery Minnow may grow up to 15 centimeters long and have a yellowish-white color. They inhabit backwaters, pools, and slow-moving waters in medium to large streams. They typically inhabit rivers with fine sand or silt substrates and feed in calm backwater areas.

Plains Minnow (*Hybognathus placitus*) – Tier 1 At-risk Species
The Plains Minnow typically inhabits large, and often turbid rivers. They thrive in shallow, sand-filled and clear streams and feed in shallow backwaters in braided channels. Habitat degradation is one of the largest threats to this species.

Flathead Chub (*Platygobio gracilis*) – Tier 1 At-risk Species
The flathead chub is an omnivorous species that can get up to 2 meters in length. This species is most commonly found in larger, turbid, and fast-moving streams but can also be found in side channels and backwaters. They inhabit streams with small substrates such as sand and gravel.

Western Blacknose Dace (*Rhinichthys obtusus*) – Tier 2 At-risk Species
The western blacknose dace is found in small, gravelly streams with a medium to high slope. They typically inhabit streams with medium to steep slopes but are also found in backwaters and pools with slower runs.

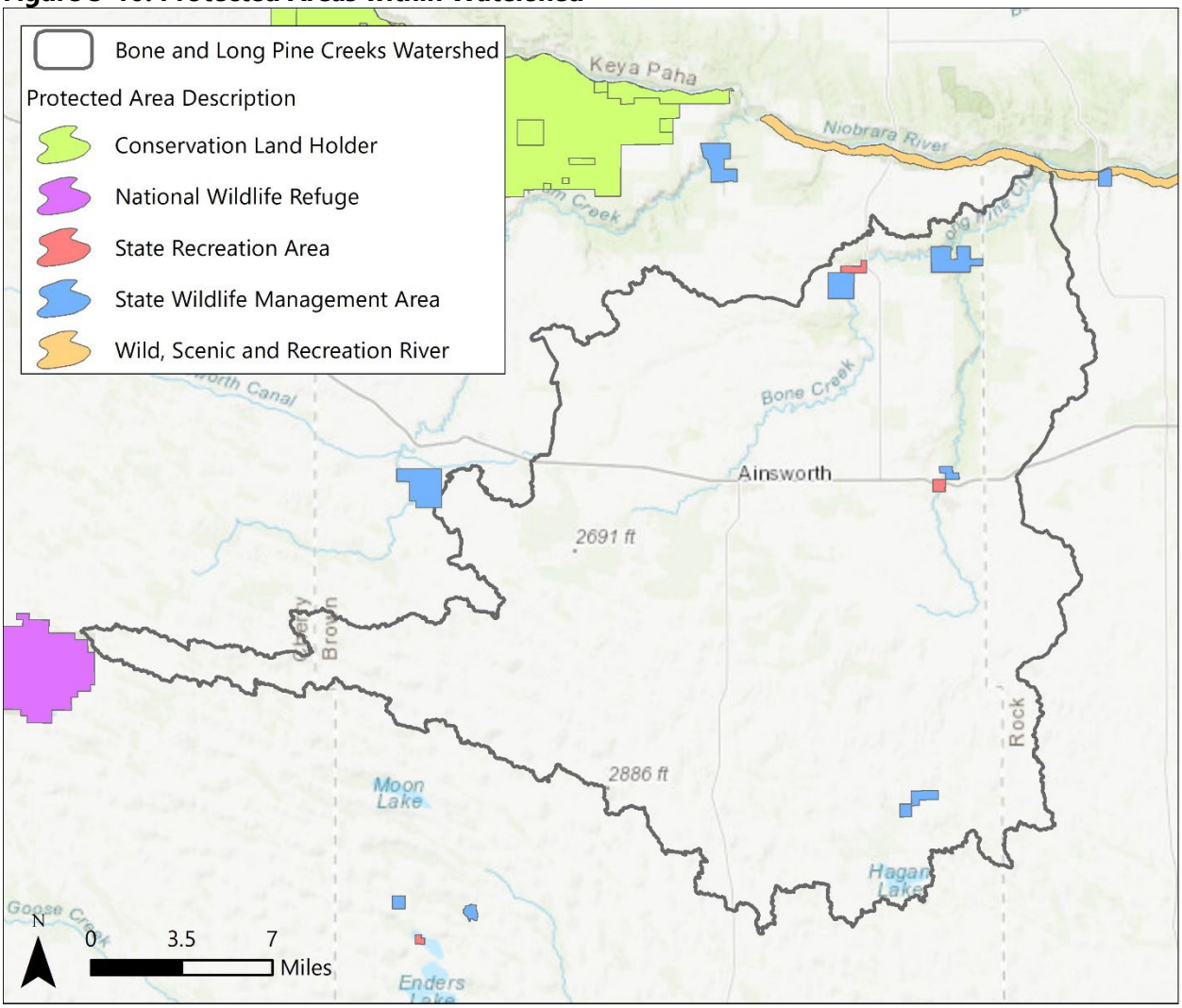
Common Shiner (*Luxilus cornutus*) – Tier 2 At-risk Species
The Common Shiner is found in small to medium streams with gravelly substrate. They typically prefer slow-moving pool habitat most common in the headwaters of the watershed.

Pearl Dace (*Margariscus nachtriebi*) – Tier 2 At-risk Species
The Pearl Dace is a small fish that grows up to 6-inches in length. They inhabit small, cool streams with either clear or turbid water. They spawn in clear, shallow streams with gravelly or sandy bottoms.

3.10 Natural Areas

NRCS defines natural areas as land and water units where natural conditions are maintained and are typically a result of minimum human intervention. They may be designated areas of Federal government, non-federal government, or private land. Designation may be provided under Federal regulations, by foundations or conservation organizations, or by private landowners that specify it as such. Natural areas are recognized as an official land use to preserve ecosystems and unique areas, establish baseline conditions, and for outdoor recreation. Protected areas are designated to preserve natural ecosystems and are shown in Figure 3-10.

Figure 3-10. Protected Areas within Watershed



Source: Conservation Biology Institute. Protected Areas, Nebraska. October 2012.

3.11 Riparian Areas

Riparian areas are transitional areas between terrestrial land and a water body, such as streams, lakes, ponds, or wetlands. The unique soils within riparian areas are strongly influenced by free and unbound water and the types and amounts of vegetation reflect this. Riparian areas provide wildlife habitat and act as a buffer to trap sediment, nutrients, and pesticides. Forested riparian areas occur within the downstream reaches of the watershed and along the perennial portions of Long Pine Creek. Cedars, cottonwoods, and willows dominate the forested riparian areas. Wet meadows and prairies, generally grazed by cattle, dominate the areas adjacent to streams in the upper reaches of the watershed. Riparian buffer widths vary widely throughout the watershed due to stream degradation, topography, groundwater levels, and land use.

3.12 Fish and Wildlife Habitat

Approximately 75 percent of the watershed is made up of grasslands, most of which is located within the Nebraska Sandhills ecosystem. The Nebraska Sandhills is a large, stabilized dune system with intact native grasslands. The dune prairie and valley wetlands are the two dominant plant communities within the

Sandhills. The dune prairie community is dominated by a combination of sand-adapted grasses such as sand bluestem, prairie sandreed, little bluestem, and hairy grama. Moist prairie areas near dune valleys are dominated by tall grasses such as big bluestem, indian grass, and switchgrass. The Sandhills are home to many types of mammals, including a variety of deer, gophers, jackrabbits, and prairie voles.

Woodland habitats make up approximately 4 percent of the watershed and are located almost entirely adjacent to downstream tributaries. A thick woodland buffer is located along the downstream portions of Long Pine Creek and Bone Creek with the riparian buffer extending up to 4,000 feet away from the streams. The woodland habitats may provide habitat for nesting of migratory birds, which occurs primarily between April 1st and July 15th as well as bobcats that are typically found in riparian areas. There is abundant terrestrial wildlife throughout the watershed including mule and white-tailed deer, pheasants, and prairie grouse.

Long Pine Creek is a cool water perennial stream with naturally reproducing brown and rainbow trout species. Adult stocking, also known as put-and-take, is utilized at Long Pine Creek to periodically add larger sized rainbow trout for fishing. All surface waters in the Long Pine Creek Watershed are classified as coldwater aquatic life. This is an indication that these waters could provide, or do provide, a habitat suitable for maintaining one or more coldwater species on a year-round basis. Long Pine Creek Watershed is home to many wetlands which provide a habitat for a variety of fish and other wildlife species. Key species are defined as endangered, threatened, sensitive, or recreationally important aquatic species (NSWQS 2019). The following key species were identified in the watershed:

- Northern redbelly dace
- Northern Pearl dace
- Finescale dace
- Flathead Chub
- Blacknose shiner
- Blacknose dace
- Plains Minnow
- Bluegill
- Brook Stickelback
- Brown trout
- Brook Trout
- Rainbow trout

Source: NDEE Title 117 – Nebraska Surface Water Quality Standards. Revised Effective Date: June 24, 2019.

3.13 Biologically Unique Landscapes

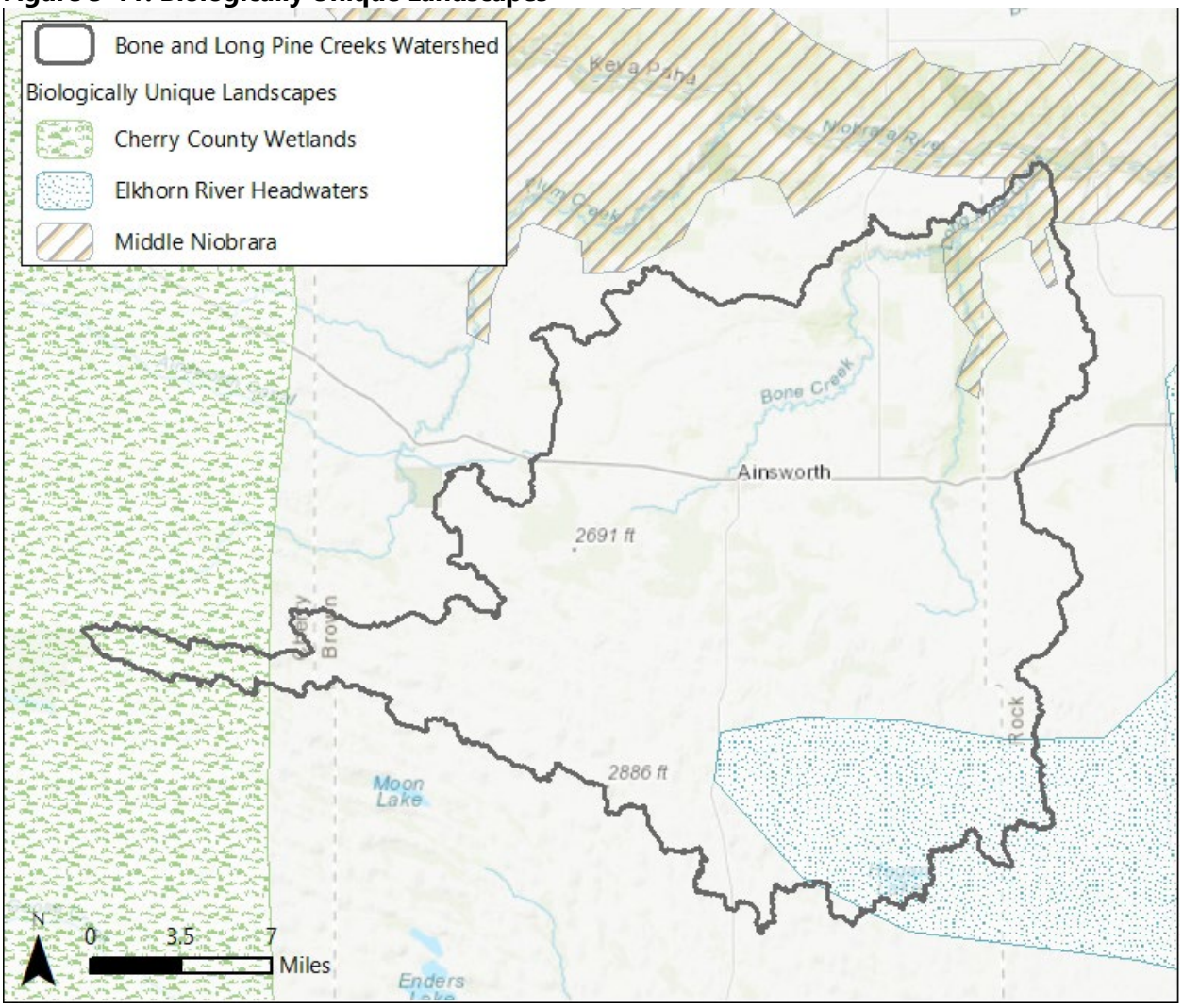
Biologically Unique Landscapes (BULs) were developed by Nebraska's Natural Legacy Project to establish "a set of priority landscapes, that if property managed, would conserve the majority of Nebraska's biological diversity" (Schneider, 2005). BULs are identified as communities that most likely conserve biological diversity of various habitat types and cumulatively, should conserve Nebraska's viable species populations. There are three biologically unique landscapes within the watershed, including Cherry County Wetlands, Elkhorn River Headwaters, and the Middle Niobrara. A description of each landscape is included below with the areas shown in Figure 3-11.

Cherry County Wetlands. This landscape occurs in Cherry County, in the western portion of the watershed. It consists of high, long linear dunes, with interdunal valleys. Several of the valleys consist of lakes, marshes, wet meadows, and fens. The upland dune grasslands are largely intact with minimal cropland.

Elkhorn River Headwaters. This landscape occurs in Brown and Rock Counties in the northeastern portion of the Watershed. This area includes level sand plain, a regionally high-water table, and extensive wet meadows and shallow marshes. Rolling sand dunes and Sandhill marshes and lakes are all present throughout the area.

Middle Niobrara. This landscape is located along the Niobrara River and designated as a National Wild and Scenic River. This area is known as the biological crossroads of the Midwest due to the diversity in plant and animal communities and native species. The area is deeply incised and provides habitat for several at-risk species.

Figure 3-11. Biologically Unique Landscapes



Source: Nebraska Game and Parks Commission, Nebraska's Biologically Unique Landscapes, Published Oct 2011.

3.14 Migratory Birds and Eagles

The Migratory Bird Treaty Act (MBTA) of 1918, as amended, Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), and the Bald and Golden Eagle Protection Act (BGEPA) of 1940, as amended, require NRCS to consider impacts on migratory bird and bald and golden eagle populations and habitats. Migratory birds are essentially all wild birds found in the United States with the exception of the house sparrow, starling, feral pigeon, and resident game birds. The protections under MBTA and BGEPA cover the birds and their parts (including eggs, nests, and feathers) and therefore it is unlawful for private individuals or Federal agencies to kill, capture, collect, possess, buy, sell, trade, ship, import, or export any migratory bird. The BGEPA includes protections for any disturbance to bald and golden eagles and their nests.

Although the MBTA and BGEPA are applicable year-round, it is accepted that most migratory bird nesting activity occurs in Nebraska during the period of April 1 to July 15. Some migratory birds nest outside of this range. For example, raptors generally nest in woodland habitats during the period of February 1 to July 15, whereas sedge wrens, which occur in some wetland habitat, normally nest from July 15 to September 10.

Many species of migratory birds could be present and likely nest within the watershed. The dense areas of woodlands adjacent to streams provide ample habitat for birds protected under the MBTA to nest. The watershed is located within the Central Flyway, which is a significant bird migration route across the United States. According to the Platte River Time Lapse, over 300 species of birds have been documented in the Sandhill ecosystem, many of which being migratory. The whooping crane is an endangered migratory bird that flies through the watershed; however, is not known to breed within Nebraska (Silcock 2020). Eagles can also be found within the watershed year-round and a moderate density of bald eagles nest and winter near the watershed outlet along the Niobrara River in the winter (NRCS 2010). Bird species of conservation concern can be found within and near the watershed and those with priority concern are listed below:

- Black Tern (*Chlidonias niger)*
- Black-billed Cuckoo (*Coccyzus erythropthalmus*)
- Bobolink (*Dolichonyx oryzirorus*)
- Chestnut-collared Longspur (*Calcarius ornatus*)
- Chimney Swift (*Chaetura pelagica*)
- Ferruginous Hawk (*Buteo regalis*)
- Franklin's Gull (*Leucophaeus pipixcan*)
- Lark Bunting (*Calamospiza melanocorys*)
- Lesser Yellowlegs (*Tringa flavipes*)
- Pectoral Sandpiper (*Calidris melanotos*)
- Prairie Falcon (*Falco mexicanus*)
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)

- Willet (*Tringa semipalmata*)

3.15 Archaeological and Historical Resources

Section 106 of the National Historic Preservation Act of 1966, as amended (54 U.S.C. § 306108) and its implementing regulations (36 CFR Part 800) require federal agencies to take into account the effect of undertakings on historic properties. Historic properties are defined as cultural resources that are listed on or are eligible for listing on the National Register of Historic Places (NRHP). The Section 106 compliance process includes the following:

- Identify consulting parties.
- Identify cultural resources located within the Area of Potential Effect (APE) and evaluate their eligibility for inclusion on the National Register of Historic Places (NRHP).
- Assess the effects of the undertaking on historic properties within the APE.
- Consult with the State Historic Preservation Officer, federally recognized Indian tribes, the Advisory Council on Historic Preservation (as appropriate), and other interested parties to resolve adverse effects.

Cultural resources are physical or other expressions of human activity or occupation and include archeological sites, buildings, bridges, business districts, culturally significant landscapes, isolated artifacts or features, culturally sacred places, and objects of cultural and historic significance. In order for a cultural resource to be eligible for the NRHP, it must be associated with events significant to the broad patterns of history; associated with the lives of persons significant in the past; embody distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic value, or represent a significant and distinguishable entity; and/or must yield or be likely to yield, information important to history or prehistory. If an undertaking will alter, damage, or destroy a historic property, the agency has a responsibility to avoid, minimize, or mitigate the adverse effect.

Past archeological investigations in the study area have focused on road rights-of-way, irrigation district inclusions, and a proposed dam project. Archeological evidence indicates that humans have occupied the general study area for at least 10,000 years. Previously recorded archeological sites in the study area include both Native American and Euro-American habitations. One Native American site may be associated with the Initial Coalescent or Oneota, and another site also appears to contain an Oneota component, but most of the previously recorded Native American sites lack diagnostic artifacts and cannot be associated with a particular time period or cultural affiliation. Euro-American settlement of the project area occurred after 1879, and previously recorded archeological sites from this period includes of the remains of farm/ranch buildings and flour mills.

Only one property in the study area is listed on the National Register of Historic Places. This resource is the Miller Hotel, located in the town of Long Pine. The hotel is not near any of the proposed Tier 1 or Tier 2 project locations and will not be impacted by this undertaking.

The affected environment for cultural resources is identified as the area of potential effect (APE). The APE is the geographic area within which federal actions may directly or indirectly cause alterations in the character or use of historic properties if present (36 CFR 800.16(d)). The APE for the Tier 1 phase of the

proposed action is 438 acres, which includes the areas of all direct and indirect effects including, but not limited to ground disturbance from construction, staging areas, access routes, and borrow areas, and the visual effects of constructed structures. 2020 Cultural Resource Inventory: A pedestrian inventory of the APE for the Tier 1 project locations was completed in November and December 2020 (Bevitt and Bevitt 2021). Shovel testing was completed in areas of low visibility, and streambanks were visually inspected for buried soils and eroding artifacts.

Five cultural resource sites were identified during the inventory. Two of the resources are 20th century windmills, two resources are early 20th century farmsteads with standing structures, and the fifth resource is a Native American campsite of undetermined age and cultural affiliation. In accordance with 36 CFR 800.4 and 36 CFR 60.4, sites within the Tier 1 project APEs were evaluated to determine eligibility for listing in the National Register of Historic Places (NRHP). The Native American campsite is the only resource that was determined eligible for inclusion in the National Register of Historic Places.

Copies of the cultural resource inventory report were submitted to the Nebraska State Historic Preservation Office and Indian tribes that may attach religious or cultural significance to historic properties within the APE for consultation in May 2021. The Nebraska State Historic Preservation Office concurred with the determinations of eligibility in a letter received June 28, 2021 (Appendix A).

3.16 Environmental Justice

There are no known major social, cultural, or political factors that may influence major changes in land use or management of the soil, water, air, plant, or animal resources. Ainsworth and Long Pine are the two main population centers within the watershed. According to 2020 Census data, the largest population center is Ainsworth. Population data from the 2020 Census is shown below in Table 3-5.

Table 3-5. 2020 Census Data

Category	Population
Brown County	2,903
Rock County	1,262
Cherry County	5,455
Ainsworth	1,616
Long Pine	305

Source: U.S. Census Bureau. 2020 Census.

In accordance with the Environmental Justice Departmental Regulation, it is imperative that the Project is compliant with Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations." Although this project will provide many benefits, it is important to ensure any negative human health and/or environmental impacts are not disproportionately carried by minorities or low-income populations.

Table 3-6 below shows the percentage of minorities within Brown, Cherry, and Rock Counties, the state of Nebraska, and the United States from 2020 Census data. A minority is a person who is a member of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. As shown in Table 3-6, the percentage of minorities within Brown, Rock, and Cherry Counties is significantly lower than the percentages within Nebraska and the United States.

Table 3-7 shows the percentage of people of all ages and minors (people under 18-years of age) below the poverty line within Brown, Rock, and Cherry Counties, the state of Nebraska, and the United States. Low-Income populations are identified as the populations living below the poverty line. As shown in Table 3-7, the percentages of all people and minors living below the poverty line within Brown, Rock, and Cherry Counties is slightly greater than the percentage within Nebraska and about the same as the percentage within the United States.

Table 3-6. 2020 Census Demographic Data

Category	Brown County	Rock County	Cherry County	Nebraska	United States
Percent Minority	8.2%	3.1%	11.5%	21.6%	38.4%

Source: U.S. Census Bureau. 2020 Census.

Table 3-7. 2020 Poverty Data

Category	Brown County	Rock County	Cherry County	Nebraska	United States
Percent in Poverty (all ages)	11%	13%	11%	9%	12%
Percent in Poverty (under 18)	15%	18%	15%	10%	16%

Source: 2020 Small Area Income and Poverty Estimates (SAIPE).

The watershed is located within block groups 310179750001, 310179750002, 310319559002, and 311499746001 and on the EPA's Environmental Justice Screening and Mapping Tool (EJ Screen). EJ Screen results are similar to those listed above, with 2 to 4 percent within the minority population and 22 to 44 percent low income (defined as income less than two times the poverty level). The demographic index (a combination of percent minority and percent low-income) varies between 13 and 24 percent within the watershed, which is in the 27th to 61st percentile for the state of Nebraska. There are no Environmental Justice communities within the watershed.

Agriculture is the principal income-generating industry within the watershed. The principal crops grown in the watershed are corn and wheat for grain. Approximately 35 percent of the cropland is irrigated. Family-owned farms are predominant in Brown, Rock, and Cherry Counties, accounting for 85, 86, and 74 percent respectively, of the farms in 2017. Tables 3-8 and 3-9 contain the specific agricultural data for Brown, Rock, and Cherry Counties and the state of Nebraska.

Table 3-8. 2012 and 2017 Agricultural Census Data

		Brown County		Rock County		Cherry County		Nebraska	
Item	Unit	2012	2017	2012	2017	2012	2017	2012	2017
Number of Farms	number	328	268	247	220	566	567	49,969	46,332
Value of Land & Bldgs. Per Acre	dollars	716	1,172	1,078	1,138	531	933	2,380	2,754
Average Size of Farm	acres	2,212	2,295	2,610	2,655	6,637	6,284	907	971
Tenure of Operator									
Full Owner	farms	156	147	91	92	281	275	24,898	24,021

		Brown County		Rock County		Cherry County		Nebraska	
Item	**Unit**	**2012**	**2017**	**2012**	**2017**	**2012**	**2017**	**2012**	**2017**
Part Owner	farms	109	93	119	100	214	234	18,836	16,840
Tenants	farms	63	28	37	28	71	58	6,235	5,471
Operators by Age Group									
Under 25	number	-	-	-	-	-	13	456	1,199
25 to 34	number	25	39	10	17	38	92	4,291	7,027
35 to 44	number	67	71	40	32	62	143	6,199	9,277
45 to 54	number	76	70	52	36	94	167	11,943	13,290
55 to 64	number	74	137	92	111	112	325	13,903	22,517
65 to 74 *2012: 65 to 69*	number	30	111	20	59	45	163	4,589	15,676
75 years & over *2012: 70 & over*	number	56	49	33	22	150	106	8,588	8,111
Average Age of Principal Operator	years	54	57	57	58	59	56	56	56
Market Value of Sold Ag Products	$1,000	195,431	290,746	97,788	108,100	246,761	230,927	23,068,756	21,983,430
Crops	$1,000	39,369	22,611	39,273	22,262	79,896	33,754	11,377,933	9,311,007
Livestock	$1,000	156,062	268,135	58,515	85,838	166,866	197,173	11,690,823	12,672,422
Days worked off farm									
None	number	123	171	113	187	255	487	21,662	33,185
Any	number	205	186	134	154	311	522	19,947	43,912
Organization Type									
Individual or Family	farms	281	227	206	189	424	420	42,543	38,200
Partnership	farms	26	20	20	19	54	50	2,974	2,883
Corporation	farms	19	13	13	9	75	77	3,784	4,268
Other	farms	2	8	8	3	13	20	668	981

Source: USDA. 2012 and 2017 Census of Agriculture.

Table 3-9. 2017 Income Data

Income Type	Brown County	Rock County	Cherry County	Nebraska
2017 Per Capita Income	$29,664	$33,867	$27,891	$29,866
Net Cash Farm Income of Operation – Average per Farm	$139,005	$67,694	$84,008	$87,824

Source: U.S. Census Bureau. Income and Poverty in the United States: 2017.

3.17 Public Health and Safety

Stream degradation and widening are common throughout the watershed and can lead to loss of land, infrastructure damage, and interruptions to essential services. Decreased water quality due to continual stream degradation is also a concern, both from major streams within the watershed and large gullies that frequently form within the uplands.

3.18 Recreation

Recreation is an important part of the Bone and Long Pine Creeks watershed. The watershed drains directly into the Niobrara National Scenic River, managed by the National Park Service, which provides opportunities for canoeing, kayaking, tubing, and camping. The watershed also includes Long Pine and Keller Park State Recreation Areas. These parks include a variety of recreational activities such as boating, camping, fishing, hiking, hunting, and archery. Kayaking has become a popular activity along the streams between the Keller Park State Recreation Area and the Niobrara River according to the NDNR. Additionally, Wildlife Management Areas (WMAs) are managed by the Nebraska Game and Parks Commission's Wildlife Division to enhance wildlife habitat for public hunting, trapping, and fishing. There are three WMAs known as Keller Park, Long Pine, and Pine Glen Wildlife Management Areas. Additionally, the Cowboy Trail is a 192-mile trail and runs through the watershed. The trail can be used for a walking, running, biking, and horseback riding.

The upland portions of the watershed are popular areas for big game, upland game, and waterfowl hunting. Public trout fishing is also available on Seven Springs, which is the wellfield for Long Pine town, the Long Pine Wildlife Management Area, Long Pine State Recreation Area, and Pine Glen Wildlife Management Area. Long Pine Creek supports one of the best trout populations within Nebraska, consisting of Rainbow and Brown trout, and is an essential resource for trout fishing. Kayaking and tubing are also popular recreational activities supported along Long Pine Creek. Stream degradation and widening, decreased water quality, and decreased fish and wildlife habitat in streams within the watershed pose a threat to recreationally significant activities such as fishing, kayaking, and floating.

3.19 Invasive Species

There are twelve state noxious weeds in the Sandhills ecoregion, shown below in Table 3-10. Bull thistle (*Cirsium vulgare*) is also listed as a county noxious weed in Brown and Rock counties. The full weed watch list for the Sandhills ecoregion is included in Appendix E.

Table 3-10. State Noxious Weeds in Sandhills Ecoregion

Scientific Name	Common Name
Carduus acanthoides	Plumeless thistle
Carduus nutans	Musk thistle
Centaurea biebersteinii	Spotted knapweed
Centaurea diffusa	Diffuse knapweed
Cirsium arvense	Canada thistle
Euphorbia esula	Leafy spurge
Fallopia japonica	Japanese knotweed
Fallopia sachalinensis	Giant knotweed
Lespedeza cuneata	Sericea Lespedeza
Lythrum salicaria, L. virgatum	Purple loosestrife
Phragmintes australis	Phragmites common reed
Tamarix ramosissima	Saltcedar

Source: www.neinvasives.com

3.20 Floodplain Management

Brown, Cherry, and Rock Counties within the watershed do not participate in the FEMA National Flood Insurance Program (NFIP) and because there are no mapped floodplain risks, there is no floodplain management in the area.

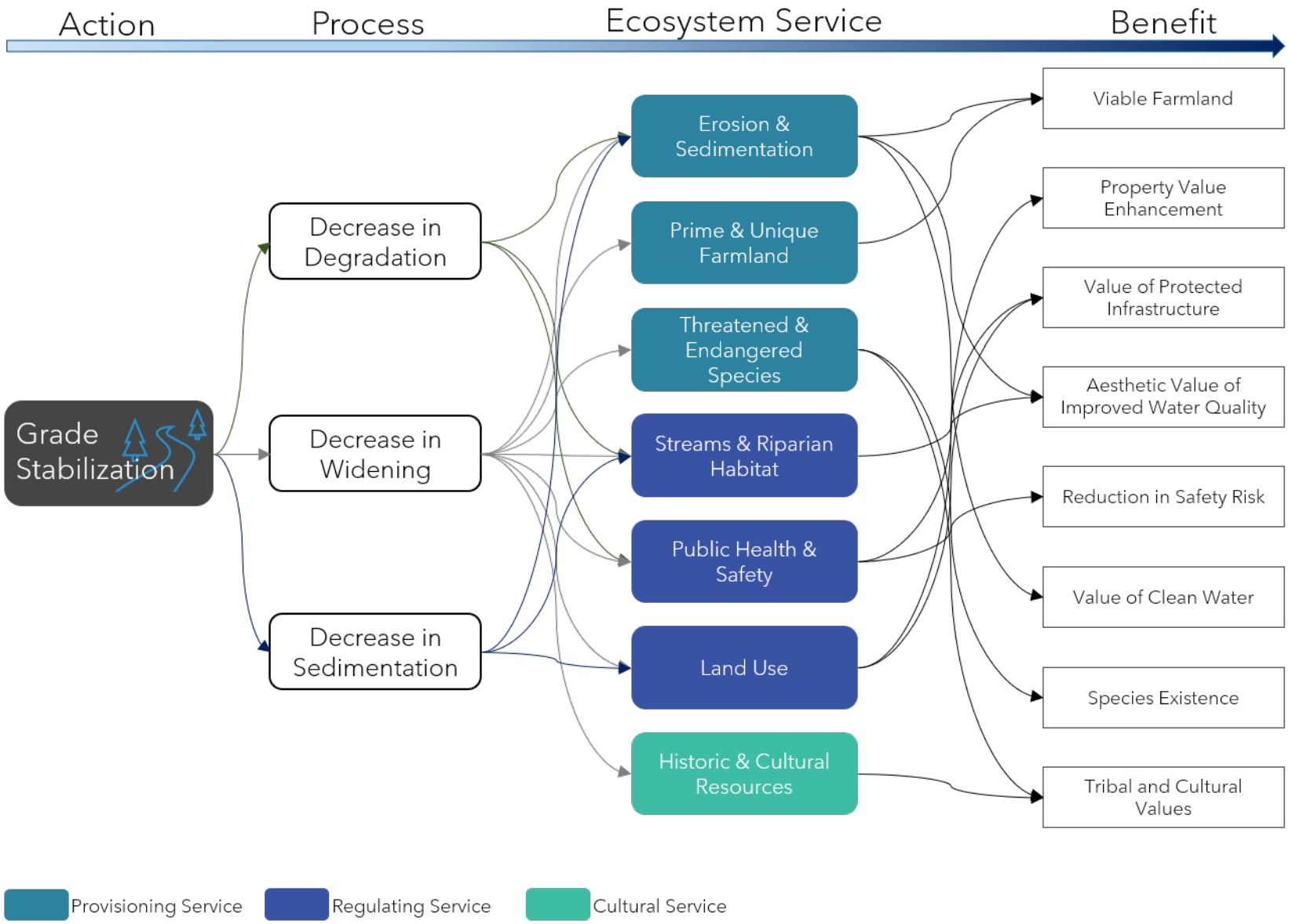
3.21 Ecosystem Services

An ecosystem services framework is required by the PR&G and provides for an integrated approach that allows consideration and transparent evaluation of the benefits (both tangible and intangible) and trade-offs of potential alternatives. Four categories of ecosystem services are described in PR&G and are included below for ease of reference.

1. **Provisioning services** are tangible goods provided for direct human use and consumption, such as food, fiber, water, timber, or biomass.
2. **Regulating services** maintain a world in which it is possible for people to live, providing critical benefits that buffer against environmental catastrophe – examples include flood and disease control, water filtration, climate stabilization, or crop pollination.
3. **Supporting services** refer to the underlying processes maintaining conditions for life on Earth, including nutrient cycling, soil formation, and primary production.
4. **Cultural services** make the world a place in which people want to live – recreational use, spiritual, aesthetic viewsheds, or tribal values.

Project scoping (see Chapter 2) led to the determination of the number and variety of resource concerns to be considered in the analysis and the existing conditions of these resources have been described in this chapter. Ecosystem service flows are both monetary and non-monetary and appropriate metrics should be based on current methodology to quantify impacted services over time and project- and regional-specific information and values. A concept diagram included below as Figure 3-12 helps to provide a visual representation of the linkages between actions and social values.

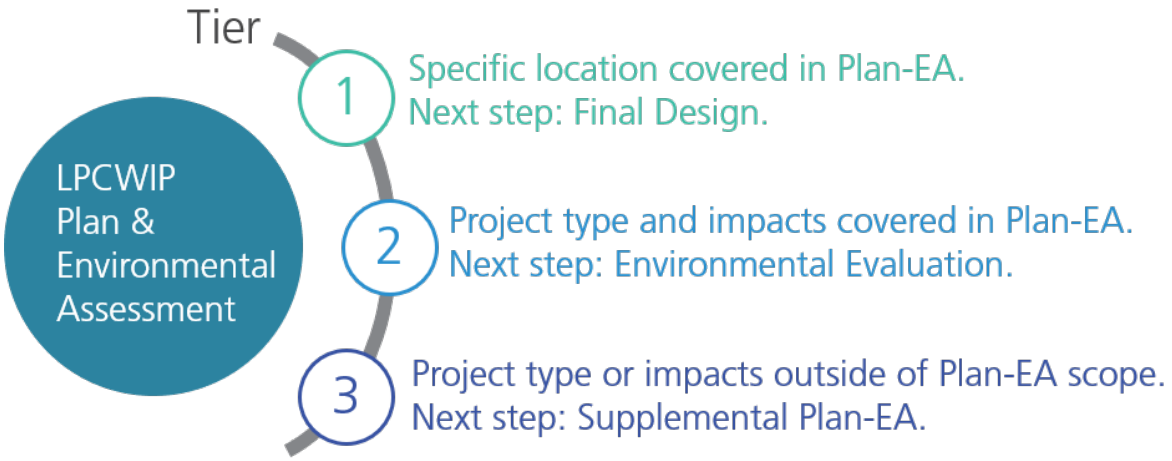
Figure 3-12. Grade Stabilization Ecosystem Services Concept Diagram



4.0 ALTERNATIVES

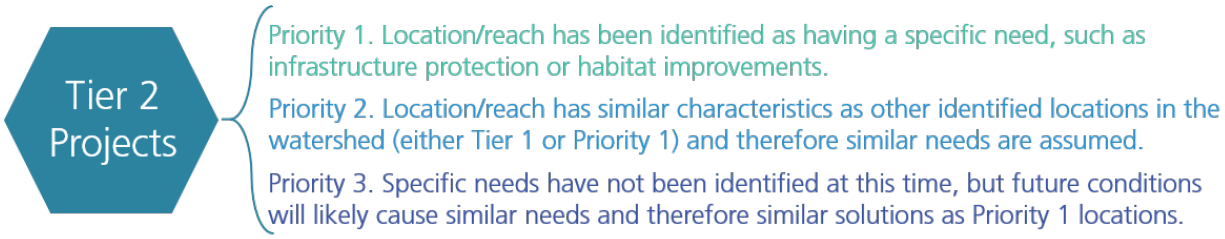
Structural and non-structural alternatives have been considered and analyzed to meet the project purpose of providing watershed protection through grade control, bank stabilization, and aquatic ecosystem restoration and rehabilitation within the Project Area. Structural alternatives range from small-scale habitat improvements to large-scale rock grade stabilization structures and are dependent on the needs within each stream reach. Specific, high-priority locations have been identified through the scoping process and interagency and landowner coordination. This included public and agency meetings to identify areas of concern, phone calls with landowners and other stakeholders, correspondence with local experts, desktop and field investigations, and other methods (additional information provided in Appendix D). Other locations have been identified and ranked as tiered locations, with design and site-specific environmental evaluations (EEs) to be completed in the future. This document intends to serve as both a site-specific and programmatic Plan-EA which will enable tiered projects in the future to be planned and allow for efficiencies in NEPA documentation, enable a more expedient planning process, and allow for adaptive management as specific storms modify the stream locations and geometry. Additional information on site identification is included in Appendix D. This overall approach is shown below in Figure 4-1 and information on the site-specific and programmatic nature of this document is included in Section 5.0 and throughout Chapter 5.

Figure 4-1. Project Tiers



Within Tier 2, there are three priority levels based on coordination with landowners and other agencies, existing conditions, potential to cause future infrastructure damage, and potential to either improve natural habitats or prevent the degradation of habitat. An overview of this is shown below in Figure 4-2 and more detail is provided in the following sections.

Figure 4-2. Tier 2 Projects



Project formulation revolved around the identified project purpose and need as well as existing resource conditions. Plans that could be implemented under the authorities of other Federal agencies, state and local entitles, and nongovernmental interests were also considered. Accordingly, local, state, regional, Federal, and nongovernmental interests participated in the formulation process. Measures considered in the formulation of alternative plans included those measures believed to be effective, efficient, and acceptable in achieving the Plan-EA purpose.

4.1 Formulation Process

The formulation process is the basis for selecting combinations of measures to include as alternatives. The combination of alternatives developed include both structural and non-structural solutions and are based on measures that could meet the project purpose and take into consideration multiple Federal requirements to streamline the planning and decision-making process. This analysis is meant to satisfy the alternative development and screening criteria requirements of NEPA, Clean Water Act (CWA) Section 404(b)(1) guidelines, and Principles, Requirements, and Guidelines (PR&G) for Federal investments in water resources. This means that a wider range of alternatives and a varied screening process was used to satisfy all applicable Federal alternatives analysis requirements to reduce the time, cost, and cumbersome agency reviews that often come with multiple analysis documents. Table 4-1 below gives a description of when each of these regulations are required.

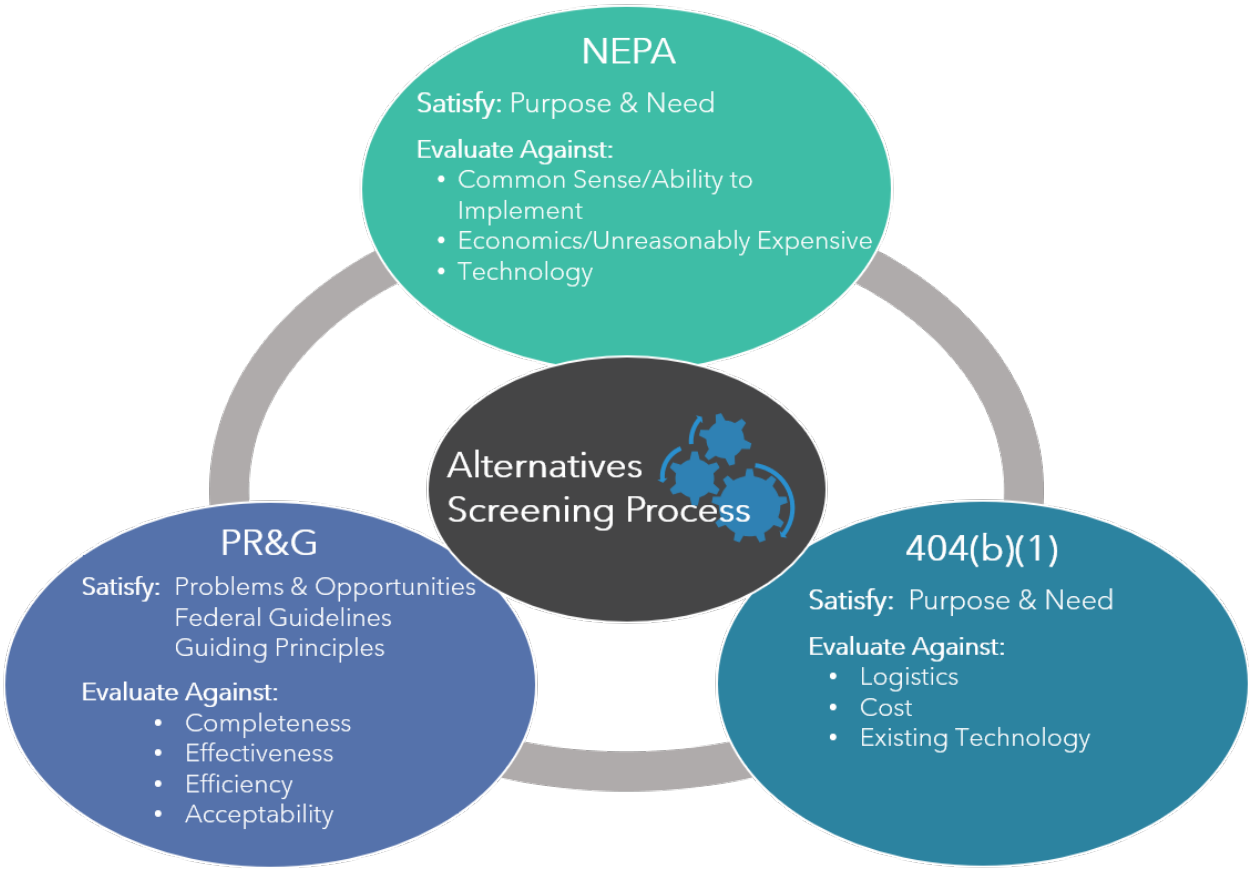
Table 4-1. Federal Requirements for Alternatives Analyses

NEPA	404(b)(1)	PR&G
National Environmental Policy Act requires Federal agencies to assess the environmental effects of proposed major Federal actions prior to making decisions.	Clean Water Act guidelines for an alternative analysis when an Individual Permit for fill in jurisdictional wetlands and/or streams is required from the USACE.	Alternatives analysis requirements when Federal funds are used for water projects. Agencies have specific guidelines, including the USDA (who is funding this Plan-EA).

To efficiently satisfy the future needs of the watershed, care was given to consider and include alternatives that could be implemented for both Tier 1 and Tier 2 projects. Once an appropriate range of alternatives is selected, each alternative is screened to determine if it should be carried forward for a more detailed analysis. Detailed analysis includes a more refined preliminary design, analysis of environmental and social consequences (both beneficial and detrimental), and a detailed analysis of costs. This pre-screening allows for a detailed look at a narrower range of alternatives, which allows for a more efficient decision-making

process. Different Federal requirements and guidelines present different screening criteria based on the overarching goal of the policy. This screening criteria is shown in Figure 4-3 below.

Figure 4-3. Alternative Screening Process



4.2 Alternatives Eliminated from Detailed Study

The alternatives eliminated from detailed study were analyzed both on a watershed-wide and site-by-site basis. The following alternatives were considered during scoping and did not satisfy the purpose and need or were otherwise removed from detailed study due to the factors shown in Figure 4-3.

Non-structural Alternatives. Non-structural alternatives include changes to policy, existing land use, infrastructure, and/or management practices to meet the project purpose and need and potentially minimize adverse changes and impacts to existing hydrologic, geomorphic, and ecological processes. To meet the project purpose, a nonstructural alternative (or combination of nonstructural/structural alternatives) would need to provide grade control, bank stabilization, or aquatic ecosystem restoration and rehabilitation. Stream degradation is a known problem within the watershed and has been amplified by the increase in baseflow due to irrigation water being brought in from outside of the watershed. Policies can help to slow stream degradation or protect future developments from being built too close to a stream, but public and regulatory policies cannot prevent the headcut progression that is common in the area. Changes in land use are equally as ineffective.

One potential nonstructural alternative is to buy the land that is expected to fall within stream limits as the streams continue to degrade and widen and allow the channel banks to become higher and the stream footprint to continue to expand. However, this would continue to cause loss of pastureland and continue to degrade aquatic ecosystem habitat. Risks to infrastructure, including culverts and bridges, also remain in this alternative. Therefore, this alternative does not meet the project purpose and need.

Irrigation water management, or modifying the amount or timing of water brought into the watershed for irrigation, is another potential nonstructural alternative. Stream flow and groundwater levels within the watershed were studied extensively to determine if any water management alternatives could meet the project purpose. Although irrigation water management techniques can help to bring the watershed back to equilibrium, changes would not bring immediate relief to locations identified during scoping that need intervention to prevent massive degradation from moving upstream to the headwaters or protecting existing infrastructure and therefore these were not included within the preferred alternative. Locations and projects to help provide passive grade stabilization through more efficient irrigation techniques were identified through coordination with the AID and are included as Tier 2 (Priority 1) locations. No nonstructural alternatives were brought forward for detailed analysis for Tier 1 projects.

Structural Alternatives. Streams throughout the watershed were evaluated using desktop analysis, previous studies, field assessment, and stakeholder input. Eleven high priority locations were identified for Tier 1 sites using these evaluations and a range of alternatives were analyzed at each if these. Potential alternatives were identified based on NRCS and other Federal, state, and other published guidance, projects that have been successful within the watershed, and engineering judgement. Alternatives that could potentially meet the project purpose and need within the watershed with reasonable success are shown in Table 4-3. These were used to analyze potential solutions at each of the priority locations and the least costly socially and environmentally acceptable alternative that could meet the purpose and need were selected for detailed analysis. Other structural alternatives were removed from further study.

4.3 Final Array of Alternatives

The following section describes the alternatives that were reasonable and satisfied the project's purpose and need. Eleven specific, high-priority locations were identified through the scoping process and interagency and landowner coordination and the alternatives focused on these locations (shown in Figure 4-4).

4.3.1 Alternative 1. No Action Alternative

This alternative is the most likely future condition if none of the action alternatives are selected. This alternative would involve no implementation of any watershed protection structures or measures through the P.L. 83-566 program. Channel instability and aquatic habitat degradation would continue throughout the watershed. This alternative does not meet the purpose and need; however, it is carried forward through the analysis as a benchmark condition.

4.3.2 Alternative 2. Combination 1

Alternative 2 is made up of projects which are divided into Tier 1 and Tier 2 project phases based on implementation timing. Specific high priority locations identified through the scoping process are included

as Tier 1 projects. Additional locations identified and ranked through the scoping process are included as Tier 2 projects, with design and site-specific environmental evaluations (EEs) to be completed in the future.

4.3.2.1 Tier 1 Phase

Tier 1 includes a combination of measures at the top 11 identified locations within the watershed and include grade stabilization, streambank protection, a stream crossing, a pond, a sediment basin, critical area planting, and aquatic organism passage. The Affected Resource Areas (ARAs) are shown in Figure 4-4, Table 4-2 below lists the alternative details, and additional details are included in Appendix C and Appendix D. Many potential project sites were identified and named throughout the planning process and some locations were eliminated from final consideration. Therefore, ARAs shown below and included within this document are not sequential but rather represent numbers assigned throughout the process. Individual measures (shown in Table 4-2) are named according to the Nebraska NRCS naming convention with the first letter identifying the type of practice, the first number indicating project purpose (2 = watershed protection), and the first number after the dash indicating the structure number on each reach beginning upstream. The number after the dash is included when similar structures are included near one site.

Figure 4-4. Locations of ARAs included in Alternative 2, Combination 1

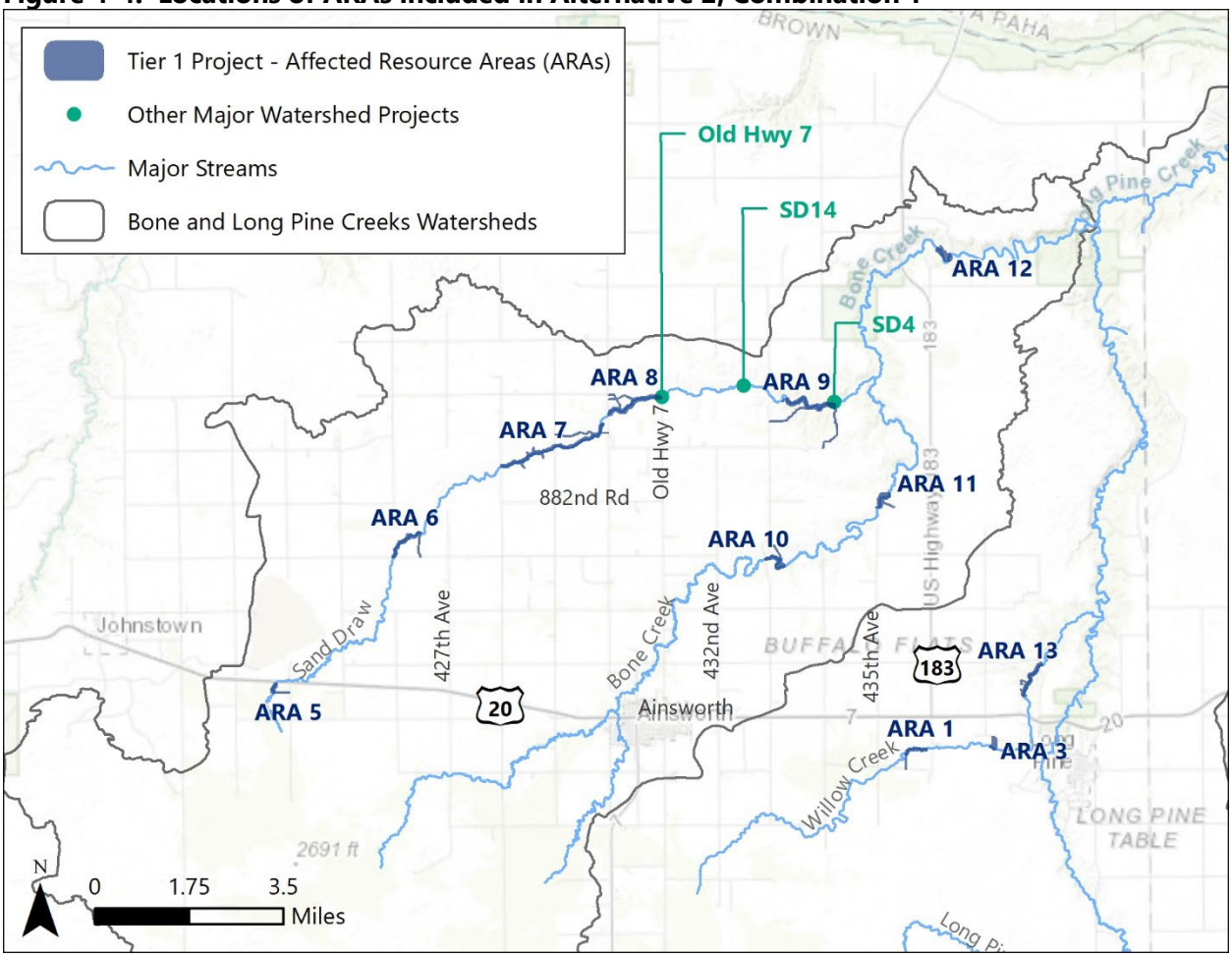


Table 4-2. Alternative 2, Combination 1 – Tier 1 Phase

ARA	Practice Type (NRCS Practice No.)	Description[1]	Name
1	Restoration structure with grade stabilization (410)	Cross vane	G2-41-1
		Cross vane	G2-41-2
		W-Weir	G2-41-3
	Grade stabilization (410)	Sill	G2-42
3	Grade stabilization (410)	Rock ramp	G2-43
	Channel bed stabilization (584)	Zeedyk structure (log and fabric) in gully	G2-44
5	Stream crossing (578)	Flexamat® crossing	SC2-1
6	Channel bed stabilization (584)	Zeedyk structure (rock rundown) in gully	G2-2-1
	Grade stabilization (410) & Aquatic organism passage (396)	Sill with fish passage	G2-2-2
7	Restoration structure with grade stabilization (410)	Cross vane	G2-3-1
		Cross vane	G2-3-2
		W-Weir	G2-3-3
		Cross vane	G2-3-4
	Pond (378)	Pond in gully	P2-4
	Water & sediment control basin (638)	Sediment basin in gully	G2-5
	Restoration structure with grade stabilization (410)	Cross vane	G2-3-5
		Cross vane	G2-3-6
	Restoration structure with streambank & shoreline protection (580)	Bendway weir	BS2-6-1
		Bendway weir	BS2-6-2
		Bendway weir	BS2-6-3
	Grade stabilization (410)	Rock ramp with grout for crossing	G2-7
8	Grade stabilization (410)	Rock ramp	G2-8-1
	Grade stabilization (410)	Rock ramp	G2-8-2
9	Grade stabilization (410)	Sill	G2-9-1
	Grade stabilization (410)	Sill	G2-9-2
	Grade stabilization (410)	Sill	G2-9-3
10	Streambank & shoreline protection (580)	Cedar revetments	BS2-30
	Grade stabilization (410)	Rock ramp	BS2-31
11	Grade stabilization (410)	Rock chute	G2-32
	Grade stabilization (410)	Sill	G2-33
	Critical Area Planting (342) & Obstruction Removal (500)	Debris removal and planting of floodplain bench	CP2-34
12	Grade stabilization (410)	Rock ramp	G2-70
	Streambank & shoreline protection (580)	Streambank protection near home	BS2-71
	Streambank & shoreline protection (580)	Streambank protection near bridge	BS2-72
13	Streambank & shoreline protection (580)	Toe protection near home	BS2-45
	Grade stabilization (410)	Rock ramp	G2-46

[1]*See Section 7.2 and Appendix D for detailed descriptions of measures*

4.3.2.2 Tier 2 Phase

Alternatives for Tier 2 locations (programmatic alternatives) were identified based on published guidance, previously successful watershed projects, input from state and Federal agencies, and engineering judgement. These alternatives and alternative descriptions are provided in Table 4-3. Information on identified locations for Priority 1 and 2 Tier 2 locations is included in Chapter 7.

Table 4-3. Programmatic Alternatives

Practice (NRCS Practice No.)	Description
Habitat improvements	
Oxbow (410, 582)	Restoring and reconnecting remnant oxbows once previously a meander of the stream
Obstruction Removal (500)	Disposal of unwanted, unsightly, or hazardous buildings, structures, vegetation, landscape features, trash, and other material.
Aquatic Organism Passage (396)	Modification of barriers that restrict or impede movement of aquatic organisms
Headwaters Excavation (646, 659)	Excavation of narrowleaf cattails and other invasives that have taken over wetlands and open water
Gravel Enhancement (395)	Gravel added to streambed to enhance fish spawning sites
Pool Construction (395)	Deep water pools constructed above and below other instream structures
Boulder Clusters (395)	Clusters of boulders for additional habitat
Habitat improvements with stream bank protection	
LUNKERS (395, 580)	Hard structures to protect stream banks and create fish habitat
Bank Shaping (580)	Floodplain reconnection, increased sediment capacity for variety of flows, protect bankfull flows
Clearing and Snagging (326)	Removing logs, boulders, drifts, and other obstructions from a channel. However, some debris will be kept in the channels to provide food and cover for aquatic organisms.
Critical Area Planting (342)	Establishes permanent vegetation on sites that have high erosion rates or conditions that prevent the establishment of vegetation with normal practices.
Cedar Revetments (395, 580)	Use of cedars to stabilize banks
Root Wads (395, 580)	Trenching tree trunk into stream bank and roots placed at upstream angle to redirect stream flow and provide overhead and bank cover for fish
Streambank Protection (580)	Immediate way to stabilize eroding channel banks with rock riprap, articulated concrete block, geosynthetics, etc.
Restoration techniques with channel alignment benefits	
Bendway Weir (580)	Controls channel depth and diverts stream energy away from banks using "rock dikes" facing upstream
Engineered Log Jams (580)	Log jams reduce stream energy directed towards banks by deflecting and diffusing energy away from banks
Longitudinal Peaked Stone Toe (LPST) (580)	Provides long term bank stability due to rock mobilizing into scour holes. Unstable conditions during short-term
Stream Barb (580)	Similar to bendway weirs but designed for smaller streams, small dikes facing upstream
J-Hook/Straight Vanes/Boulder Vanes (580)	Maintain scour pool in center of stream with deposition along stream bank due to flow redirection
Vortex Structures, Spur Logs, Hardpoint/Wing Deflectors (580)	Rocks and/or logs to redirect water flow and create deep clean pool habitat
Restoration techniques with grade control	
Free Standing Rock Arch Rapids (410)	Stabilizes abrupt and significant grade changes
Cross Vane (410)	Directs flow towards center of channel, maintaining a deep pool
W-Weir (410)	Similar to cross vanes but can concentrate flow across wider streams
Step pool system (410)	Dissipates energy in steep gradient channel by a series grade control drops
Rock and log riffle (410)	Diversify flow regimes and provide grade control
Grouted Grade Control (410)	Handle significant headcuts where inadequate riprap is easily available

Practice (NRCS Practice No.)	Description
Beaver Dam Analogues (395, 410)	Log structures that mimic beaver dam activity
Zeedyk Structures (584)	Low profile, hand-built treatments made of rock or wood intended to restore hydrologic and ecological function of wet meadows and small streams
Channel Reconstruction, Priority 2 Stream Restoration (580)	Total reconstruction of the stream channel to mimic or promote ''natural'' conditions
Grade control	
Stream Crossings (578)	Stabilized area or structure constructed across a stream to provide controlled access
Flexamat® or approved alternative Crossings (578)	Flexamat® or approved alternative crossings that allow for fish passage
Small pond or check dam (378 or 410)	Help stabilize eroding channels and create pools for increased habitat diversity (intended for smaller drainage areas)
Rock Chutes (410)	Maintain existing headcuts/drops
Rock Ramps (410)	Captures imminent headcut progression
Sills (410)	A series of weirs (sills) that establishes a pool-riffle system and can re-establish grade
'Passive' solutions to grade control	
Irrigation Water Management (449)	Controlling volume, frequency, and application rate of irrigation water
Off-Stream Water Development (614)	Off-stream water for livestock

4.4 Alternatives Summary and Comparison

Project scoping (see Chapter 2) led to the determination of the number and variety of ecosystem services (or resources of concern) to be considered in the analysis. Information on existing conditions of these resources is provided in Chapter 3 and analysis and discussion of environmental consequences for each resource is provided in Chapter 5. Appropriate metrics were defined for each ecosystem service based on current methodology to quantify impacted services over time. Monetary values were used where appropriate.

To assist in evaluating the trade-offs of the ecosystem services relative to each alternative over time, a symbolic system was developed to show the potential effects. This system and the definitions used to quantify the magnitude of the effects are included below in Table 4-4. This symbolic summary of the trade-offs is provided in Table 4-5 with details provided in Table 4-6.

Table 4-4. System for Ecosystem Services Trade-Offs

Symbol	Description
xxx	Alternative will have a major effect on the item or concern. Major impacts include those that are long-term or permanent, result in significant controversy, could result in a loss of life or jeopardize the survival of a sensitive resource, or result in impacts that cannot be mitigated. These also include effects that go directly against the Federal Objective.
xx	Alternative will have a moderate effect on the item or concern. Moderate impacts include those that are short-term or long-term and can be reasonably replaced or restored with mitigation measures.

Symbol	Description
x	Alternative will have a minor effect on the item or concern. Minor impacts include those that are temporary, short-term, or long-term and do not require mitigation.
--	Alternative will have a negligible impact on the item or concern.
+	Alternative will result in a minor improvement on the item or concern. Minor improvements can include those that are temporary or short-term.
++	Alternative will result in a moderate improvement to the item or concern. Moderate improvements include those that are short-term, long-term, or permanent. These include measurable effects that improve services but are not anticipated to result in a major benefit or life- saving measure.
+++	Alternative will result in a major improvement to the item or concern. Major improvements include those that are long-term or permanent. These include measurable effects that improve services resulting in a designation change or life-saving measure. Examples of a designation change include removing a waterbody from the list of 303(d) impaired waters or significantly improving anticipated survival of a listed species.
Duration of Effects	
Temporary	Brief effects lasting less than 1 year
Short-Term	Effects lasting 1 to 5 years
Long-Term	Effects lasting 5 to 10 years
Permanent	Effects lasting over 10 years

Table 4-5. Summary Comparison of Alternative Plans[1]

Item or Concern		Alternative 1. No Action	Alternative 2. Combination 1. Preferred Alternative
Installation Cost	NRCS Contribution	--	$5,493,700
	Sponsor Contribution	--	$1,650,700
	Total	$0	$7,144,400
PR&G Guiding Principles	Healthy and Resilient Ecosystems*		✓
	Sustainable Economic Development*		✓
	Floodplains*	N/A	N/A
	Public Safety		✓
	Environmental Justice	✓	✓
	Watershed Approach		✓
	**Represents the Federal Objective*		
Alternatives			
Locally Preferred			✓
Non-Structural		✓	
Ecosystem Service Trade-Offs			
Erosion and Sedimentation		XX	++
Prime and Unique Farmland		X	--
Threatened and Endangered Species		--	--
Migratory Birds/Bald and Golden Eagles		X	+
Biologically Unique Landscapes (BUL)		--	--
Water Quality		X	++
Water Quantity		--	--
Regional Water Management Plans		--	++
Streams		X	+++
Wetlands		X	+
Riparian Areas		X	++
Public Health and Safety		XX	++

Item or Concern	Alternative 1. No Action	Alternative 2. Combination 1. Preferred Alternative
Climate Change	--	+
Land Use	--	--
Wild and Scenic Rivers	--	--
Natural Areas	--	+
Fish and Wildlife Habitat	X	++
Archeological and Historical Resources	--	Cannot be evaluated at this time
Environmental Justice	--	--
Recreation	--	+
Invasive Species	--	--
Floodplain Management	--	--
Provisioning Services	X	+
Regulating Services	XX	++
Supporting Services	XX	++
Cultural Services	X	+

[1]*See Table 4-4 for a description of the symbols shown in this table.*

Table 4-5a. Summary Comparison of Alternative Plans[1]

Item or Concern		Alternative 1. No Action	Alternative 2. Tier 2 (Priority 1 and 2)
Installation Cost	NRCS Contribution	--	$7,638,700
	Sponsor Contribution	--	$2,152,200
	Total	$0	$9,790,900

Table 4-6. Ecosystem Trade-offs of Alternative Plans

Item or Concern	Alternative 1. No Action	Alternative 2.[1] Combination 1. Preferred Alternative
Ecosystem Service Trade-Offs		
Erosion and Sedimentation	Erosion and sedimentation would continue.	Reduction in annual sedimentation through grade control and bank stability measures Sediment Storage: Will capture and store 15.5 acre-feet of sediment over the design life.
Prime and Unique Farmland	Approximately 51,170-acres of prime farmland and farmland of statewide importance are within the watershed. There will be a continued risk to prime farmland due to stream degradation and widening.	Will decrease prime and unique farmland lost to stream degradation and widening. No Farmland Protection Policy Act (FPPA) significant concerns.
Migratory Birds/Bald and Golden Eagles	Stream degradation and widening would continue, which would impact aquatic habitat and riparian areas. This may impact habitat and feeding grounds of migratory birds and eagles.	No adverse impact. Improving aquatic habitat and reducing stream degradation may improve the habitat and feeding locations of migratory birds and eagles. No habitat destruction would occur from February 1 to July 15 to avoid impacts to nesting birds and raptors. If tree clearing must occur, bird surveys would be conducted.
Threatened and Endangered Species	No direct effect. Indirect effects of continued degradation, especially in headwaters, include decrease in aquatic habitat for sensitive species.	Listed species: projects aim to improve and/or protect habitat. For species that are not a 'no effect' based on range, habitat, etc., consultation during final design and implementation will ensure measures are in-place to reach a NLAA decision prior to implementation.
Biologically Unique Landscapes (BUL)	No change to existing conditions.	Outside of BULs. Will improve water quality to downstream BUL by providing grade stabilization and shoreline protection.
Water Quality	Continued degradation and increased sediment loads downstream.	Reduction in erosion and influx of nutrients from sediment to downstream waterbodies.
Water Quantity	No change to existing conditions.	Minor improvements from decrease in water quantity and resulting stream stability downstream of P2-4 and G2-5.

Item or Concern	Alternative 1. No Action	Alternative 2.[1] Combination 1. Preferred Alternative
Regional Water Management Plans	No effect.	Project at all sites align with the goals and objectives of other water resource plans in the watershed, which include improving water quality with stream stabilization. Potential to leverage Federal funds with other local, regional, and State funding sources to reach watershed goals.
Streams	Streams would continue to degrade and widen, resulting in decrease in stream function.	Overall, stream function will improve with this Alternative. Preventing headcut progression and stream degradation and widening will result in an increase in stream function and habitat. Some fill, inundation, and excavation will result from the implementation of the proposed structures. Total Impacts (fill, excavation, inundation): Intermittent: 2,964 feet Perennial: 8,871 feet See Chapter 5 of the Plan-EA for impact specifics.
Wetlands	Continued degradation may lead to destruction of riverine wetlands.	Net loss of approximately 0.38-acres of wetlands. Wetlands are predicted to establish near G2-2-2 and prevention of future destruction of wetlands due to degradation/widening is anticipated at ARAs 5, 6, 10, and 12.
Riparian Areas	Streams would continue to degrade and widen, resulting in a loss of riparian habitat.	Streams will be stabilized resulting in the protection of riparian areas. Improvement to approximately 5.4 acres of riparian habitat at CP2-34 by re-establishing riparian vegetation.
Public Health and Safety	Continued safety risks due to high and unsafe stream banks and lost bridges and culverts.	Alternative will improve safety and protect infrastructure along stream corridors.

Item or Concern	Alternative 1. No Action	Alternative 2.[1] Combination 1. Preferred Alternative
Climate Change	Climate change in Nebraska could result in an increase in extreme storm events, leading to increased stream degradation rate.	Climate change in Nebraska could result in an increase in extreme storm events, leading to increased stream degradation rate. Alternative would increase climate change resiliency by protecting streams from headcut progression and stream degradation.
Land Use	Ongoing stream degradation and widening would result in a loss of land along the stream corridors.	No effect.
Wild and Scenic Rivers	No effect.	Alternative does not invade or diminish the Wild or Scenic River (Niobrara River).
Natural Areas	No effect.	Features at ARA 12 would provide grade control that would protect upstream natural areas protected by NGPC.
Fish and Wildlife Habitat	Streams would continue to degrade and widen, resulting in minor loss of riparian habitat.	Protection of terrestrial and aquatic habitat due to reduction in stream degradation and widening. Implementation of in-stream habitat improvement measures and fish passage techniques to provide for and improve fish habitat.
Archeological and Historical Resources	No effect.	Cultural resource investigations were completed for Tier I location APE's. It was determined no historic properties will be affected. Effects to historic properties by Tier 2 locations will be analyzed and resolved with the implementation of the Section 106 Programmatic Agreement. A copy of the Programmatic Agreement is included in Appendix E.
Environmental Justice	Alternative would not disproportionately impact minority, Tribal, or low-income populations.	Alternative would not disproportionately impact minority, Tribal, or low-income populations.
Recreation	No effect.	Improved in-stream fish habitat resulting in improved fishing within the watershed.
Invasive Species	No effect.	Negligible effect

[1]*Site specific design and EEs will be completed for the Tier 2 phase in the future and therefore specific ecosystem services trade-offs are included only for the Tier 1 phase.*

5.0 ENVIRONMENTAL CONSEQUENCES

Potentially affected resources within the watershed were identified during project scoping, as shown in Chapter 2. An Environmental Evaluation (EE) using NRCS form number NE-CPA-52 was completed during this process. Chapter 3, 'Affected Environment', describes the resources as they currently exist within the watershed. This chapter describes the environmental consequences and impacts of the alternatives described in Chapter 4. Each resource of concern (or ecosystem service) is grouped into four service categories, described in Section 3.21. Appropriate metrics were defined for each ecosystem service based on current methodology to quantify impacted services over time. Monetary values were used where appropriate. Definitions of impact types (duration and extent) are provided above in Table 4-4.

Alternatives brought forward for detailed study include the No Action/Future without Federal Investment alternative (Alternative 1) and a combination of alternatives referred to as Alternative 2. Alternative 2 is detailed in Table 4-2. Prior to field work and other analyses performed on each resource concern, Affected Resource Area (ARA) boundaries were drawn for each alternative listed in Table 4-2. These boundaries include the physical, ecological, economic, and social characteristic of the project area that would be impacted by construction if selected as the preferred alternative. Impacts described in this chapter for each resource concern revolve around the ARAs rather than the entire watershed boundary. See Appendix C for ARA maps associated with each alternative outlined in Table 4-2.

Measures for Tier 2 projects (programmatic measures) were also analyzed for potential environmental consequences within the applicable stream reaches for each suite of measures. These measures, applicable stream reaches, and measure descriptions are provided in Table 5-1. In addition to the effects analysis conducted during the development of this Plan-EA, additional site-specific reviews will be conducted for locations outside of the established ARAs to ensure compliance with NEPA, NRCS regulations, and other requirements for protecting the environment as outlined in the National Environmental Compliance Handbook (NRCS 2016). The site-specific review must be initiated by the Sponsor or the Nebraska NRCS State office prior to final design and includes conducting an EE documented on the NRCS CPA-52 to determine if there are significant issues or impacts that have not been adequately evaluated in this Plan-EA or other existing NRCS programmatic EAs. The Responsible Federal Official (RFO) will utilize the results of the EE to ensure that the NEPA analysis is sufficient or if an additional EA or Environmental Impact Statement (EIS) is necessary to comply with NEPA and other regulations. To ensure compliance with the National Historic Preservation Act and associated authorities, the procedures outlined in the Programmatic Agreement found in Appendix E will be followed.

Table 5-1. Tier 2 Measures

Practice	Applicable Reaches/Sites	Description
Habitat improvements		
Oxbow	All	Restoring and reconnecting remnant oxbows once previously a meander of the stream
Obstruction Removal	All	Disposal of unwanted, unsightly, or hazardous buildings, structures, vegetation, landscape features, trash, and other material.
Aquatic Organism Passage	All	Modification of barriers that restrict or impede movement of aquatic organisms
Headwaters Excavation	Mid to Upper	Excavation of narrowleaf cattails and other invasives that have taken over wetlands and open water
Gravel Enhancement	In conjunction with other practices	Gravel added to streambed to enhance fish spawning sites
Pool Construction	In conjunction with other practices	Deep water pools constructed above and below other instream structures
Boulder Clusters	All, with special considerations	Clusters of boulders for additional habitat
Habitat improvements with stream bank protection		
LUNKERS	Upper	Hard structures to protect stream banks and create fish habitat
Bank Shaping	All	Floodplain reconnection, increased sediment capacity for variety of flows, protect bankfull flows
Clearing and Snagging	All, with special considerations[1]	Removing logs, boulders, drifts, and other obstructions from a channel. However, some debris will be kept in the channels to provide food and cover for aquatic organisms.
Critical Area Planting	All	Establishes permanent vegetation on sites that have high erosion rates or conditions that prevent the establishment of vegetation with normal practices
Cedar Revetments	Mid to Upper	Use of cedars to stabilize banks
Root Wads	Mid to Upper	Trenching tree trunk into stream bank and roots placed at upstream angle to redirect stream flow and provide overhead and bank cover for fish
Streambank Protection	All	Immediate way to stabilize eroding channel banks with rock riprap, articulated concrete block, geosynthetics, etc.
Restoration techniques with channel alignment benefits		
Bendway Weir	Mid to Upper	Controls channel depth and diverts stream energy away from banks using “rock dikes” facing upstream
Engineered Log Jams	Upper, with special considerations	Log jams reduce stream energy directed towards banks by deflecting and diffusing energy away from banks
Longitudinal Peaked Stone Toe (LPST)	Mid to Upper	Provides long term bank stability due to rock mobilizing into scour holes. Unstable conditions during short-term
Stream Barb	Upper	Similar to bendway weirs but designed for smaller streams, small dikes facing upstream

Practice	Applicable Reaches/Sites	Description
J-Hook/Straight Vanes/Boulder Vanes	Mid to Upper	Maintain scour pool in center of stream with deposition along stream bank due to flow redirection
Vortex Structures, Spur Logs, Hardpoint/Wing Deflectors	Mid to Upper	Rocks and/or logs to redirect water flow and create deep clean pool habitat
Restoration techniques with grade control		
Free Standing Rock Arch Rapids	Mid to Upper, with special considerations	Stabilizes abrupt and significant grade changes
Cross Vane	Mid to Upper	Directs flow towards center of channel, maintaining a deep pool
W-Weir	Mid to Upper	Similar to cross vanes but can concentrate flow across wider streams
Step pool system	Upper	Dissipates energy in steep gradient channel by a series grade control drops
Rock and log riffle	Upper	Diversify flow regimes and provide grade control
Grouted Grade Control	All	Handle significant headcuts where inadequate riprap is easily available
Beaver Dam Analogues	Upper	Log structures that mimic beaver dam activity
Zeedyk Structures	Gullies	Low profile, hand-built treatments made of rock or wood intended to restore hydrologic and ecological function of wet meadows and small streams
Channel Reconstruction, Priority 2 Stream Restoration	Mid to Upper	Total reconstruction of the stream channel to mimic or promote 'natural' conditions
Grade control		
Stream Crossings	All	Stabilized area or structure constructed across a stream to provide controlled access
Flexamat® Crossings	Mid to Upper	Flexamat® crossings that allow for fish passage
Small pond or check dam	Gullies, Mid to Upper	Help stabilize eroding channels and create pools for increased habitat diversity (intended for smaller drainage areas)
Rock Chutes	Mid to Lower	Maintain existing headcuts/drops
Rock Ramps	Mid to Lower	Captures imminent headcut progression
Sills	All	A series of weirs (sills) that establishes a pool-riffle system and can re-establish grade
'Passive' solutions to grade control		
Irrigation Water Management	All	Controlling volume, frequency, and application rate of irrigation water
Off-Stream Water Development	All	Off-stream water for livestock

[1] The word "All" is used to imply that debris will be removed from within each of the project ARAs. However, they remainder of the channel will maintain current amount of debris that can be utilized by different species as suitable habitat.

5.1 Erosion and Sedimentation

No Action Alternative. This alternative would not protect streams from degradation and erosion or prevent sediment from entering streams and water bodies. This alternative would continue to allow the influx of nutrients to enter downstream waters, compromise water quality within and downstream of the watershed, and continue to negatively impact fish habitat.

Alternative 2, Tier 1 Projects. Overall, this alternative provides a moderate, long-term to permanent benefit to reducing erosion and sedimentation. This alternative involves channel stabilization at ARAs 1, 3, 6, 7, 8, 9, 10, 11, 12, and 13; gully stabilization at ARAs 3 and 6; and a pond and sediment basin at ARA 7. The channel and gully stabilization alternatives will protect the upstream channels and gullies from erosion at the proposed stabilization measure locations. The sill structures, pond, and sediment basin will capture and store accumulated sediment. Due to the pond and sediment basin's trapping of sediment, the floodwater that flows downstream of these structures may be sediment deprived. It is possible this could increase erosion downstream, but the effects are expected to be minimal given the existing conditions of the stream and soil types and sufficient downstream erosion protection has been included. This alternative would reduce the influx of nutrients from sediment to downstream water bodies, which harms water quality and degrades fish habitat. Projects within this alternative will capture 15.5 acre-feet of sediment throughout the project life, with 5.3 acre-feet behind sills at ARAs 1, 9, and 11 that are expected to fill quickly based on past projects within the watershed. However, some sedimentation will still occur, continuing to provide habitat for endangered and threatened species downstream. Temporary, minor negative impacts to soil erosion may occur during construction and general erosion control measures will be implemented to minimize these as much as possible.

Alternative 2, Tier 2 Projects. These alternatives are designed to improve habitat and stream stability and therefore largely reduce potential erosion and resulting sedimentation from rills, gullies, and streambanks. They will have a moderate, short-term to permanent beneficial impact on sediment and erosion. Some minor, temporary negative impacts to soil erosion may occur. These temporary impacts will be analyzed during the site-specific Environmental Evaluation (EE) and general erosion control measures to counteract these impacts will be defined prior to implementation of obstruction removal, headwater excavation, bank shaping, clearing and snagging, and Priority 2 Stream Restoration due to the amount of bare soil potentially present during and immediately after construction.

5.2 Prime and Unique Farmland

No Action Alternative. This alternative would not convert any prime or unique farmland or farmland of statewide importance. Continued land loss due to stream degradation and widening would threaten existing farmland.

Alternative 2, Tier 1 Projects. The Nebraska NRCS natural resources inventory specialist completed land evaluation analyses using the Form CPA-106 Farmland Conversion Impact Rating for Corridor Type Projects for each ARA. Form CPA-106 is based on a point system that has 160 points set as a minimum number of 'total points' that triggers in-depth site reviews. Implementation of this alternative results in each site having a 'total points' score of less than 160 and therefore this alternative is clear of Farmland Protection Policy Act (FPPA) significant concerns.

Alternative 2, Tier 2 Projects. No direct impacts (FPPA significant concerns) are anticipated with the implementation of programmatic alternatives, either as single projects in specific locations or as a

combination of various practices along a stream reach. This is because of both the relatively small footprint of the alternatives and the location of classified unique farmland within the watershed.

5.3 Water Quality

No Action Alternative. This alternative would allow the existing level of sediment and associated nutrients to enter streams and downstream waterbodies. Streams would continue to degrade and erode, and the associated sediment loads would decrease water quality.

Alternative 2, Tier 1 Projects. Implementation of this alternative would provide grade control and stream stabilization and would consequently reduce stream erosion and the influx of nutrients from sediment to downstream waterbodies. Additionally, the construction of the sills, pond, and sediment basin will protect the downstream water quality by detaining sediment that would otherwise enter the downstream water bodies. Tier 1 project sites are located outside of established wellhead protection zones. This alternative provides a moderate, permanent benefit to water quality.

Alternative 2, Tier 2 Projects. Habitat improvement alternatives are anticipated to have a negligible impact on water quality. Alternatives that offer stream bank protection, alignment benefits, grade control, and 'passive grade control' will provide a minor to moderate, short-term to permanent improvement to water quality by reducing erosion and therefore the influx of nutrients into downstream water bodies. Off-stream water development can provide a moderate, permanent benefit to water quality by reducing the impacts of cattle stream access. Stream reaches within wellhead protection zones will utilize best management practices and follow any established regulations. Individual site-specific analysis could be required to quantify water quality benefits during the EE evaluation if designing in conjunction with other funding sources, such as NDEE 319 funds.

5.4 Water Quantity

No Action Alternative. This alternative would not alter water quantity or timing of water within the watershed and will therefore have no impact on water quantity.

Alternative 2, Tier 1 Projects. Tier 1 proposed measures within this combination of alternatives will have negligible impacts on water quantity. Overall, this alternative provides minor improvements to water quantity. AID's canal has crossings over the watershed streams and would be significantly impacted by the impending headcuts migrating through the system. Construction of grade control projects on this stream will offer protection to AID's canal and save significant costs should this crossing fail in the future. However, in order to construct any in-stream measures, water management actions (i.e. dewatering, moving water, water displacement, etc.) will need to be taken. During implementation, coordination with both USFWS and NGPC will take place to ensure minimal negative effects to the stream system conveyance. There will be no impacts to water quantity and the AID other than infrastructure protection.

Alternative 2, Tier 2 Projects. Most of these alternatives will have a negligible impact on water quantity. Oxbow reconnection can provide minor, short-term beneficial impacts and small ponds, check dams, and bank shaping can provide moderate, long-term beneficial impacts. Irrigation water management can provide major, permanent improvements to water quantity by tracking, identifying, and reducing excess irrigation water brought into the watershed during or immediately following precipitation events. These

practices can decrease excess flows and velocities in the streams and reduce stream instability. No programmatic alternatives are anticipated to have negative effects on water quantity.

5.5 Regional Water Management Plans

No Action Alternative. This alternative would have no impact on regional watershed management plans.

Alternative 2, Tier 1 Projects. Implementation of this alternative will support the 2016 WQMP implementation strategy by implementing stream restoration projects within the 2016 WQMP Priority 1 watersheds for stream rehabilitation and improved water quality. Three project sites (ARAs 10, 11, and 12) are located along the Bone Creek segment (NI3-12220), identified as a 'Special Priority Area' "with specific, limited, and urgent needs" (2016 WQMP). This alternative would implement stream rehabilitation projects in the Special Priority Areas identified for needing bed and bank stabilization measures in the 2016 WQMP. Portions of this alternative are eligible for additional funding through NDEE, Nebraska Environmental Trust (NET), Nebraska Water Sustainability Fund (WSF), NGPC, Sandhills Taskforce, and USFWS. Leveraging Federal construction dollars with these other funding sources will help to achieve the purpose of this project throughout the watershed.

Alternative 2, Tier 2 Projects. Alternatives that provide channel alignment benefits, bank protection, and grade control support the 2016 WQMP implementation strategy. Many of the programmatic alternatives were identified by the NGPC and will be eligible for additional implementation funding through NGPG, USFWS, and Sandhills Taskforce due to their benefits to aquatic habitat.

5.6 Wetlands

The extents and types of existing wetlands within each ARA are shown in figures included in Appendix C.

No Action Alternative. Continued degradation and widening of watershed streams would threaten existing wetlands along stream corridors, resulting in long-term adverse impacts. Additional long-term adverse wetland impacts would be seen in the headwaters of the watershed as headcuts would continue to progress upstream and threaten large areas of existing wetlands.

Alternative 2, Tier 1 Projects. Wetland impacts of the alternative are shown below in Table 5-2. A total of 0.38 acres of wetlands will be impacted from this alternative. Compensatory wetland mitigation will not be required as this alternative's components will likely fall under a Nationwide Permit 27. Wetlands are predicted to establish approximately 2 feet vertically above and below the permanent pool elevation at the sill at ARA 6. Implementation of stream stability measures, especially in the headwaters of the watershed, are expected to facilitate wetland creation. Features at ARAs 5, 6, 10, and 12 will protect the destruction of existing wetlands by halting existing stream degradation. Overall, this alternative is expected to provide a moderate, long-term improvement to wetlands within the watershed.

Table 5-2. Wetland Impacts, Alternative 2

ARA	Cowardin Wetland Classification	Hydrogeomorphic Classification	Impacts (ac)
5	PEMC	Riverine	0.03
6	PEMC	Riverine	0.17
9	PEMC	Riverine	0.02
10	PEMC	Riverine	0.01
12	PEMC	Riverine	0.14
13	PEMC	Riverine	0.01
		Total	0.38

[1]*PEMC = Palustrine emergent seasonally flooded*

Alternative 2, Tier 2 Projects. It is anticipated that these alternatives will cause negligible impacts to moderate improvements to wetlands, depending on the location within the watershed. If there are impacts to wetlands or other waters of the U.S., impacts will be kept to the minimum necessary and all alternatives will need to comply with the Clean Water Act regulations and permitting prior to initiation of construction. A site-specific EE will analyze potential impacts to wetlands to determine potential significance and any project that would cause significant impacts will require a Supplemental EA.

5.7 Streams

The extents and types of streams within the ARAs are shown in Appendix C. The NeSCAP and SVAPV2 were performed for existing conditions within each ARA and the results are included in Appendix E.

No Action Alternative. This alternative would not place fill in or inundate any streams. However, the streams within the ARAs and throughout the watershed are experiencing continual degradation, widening, and erosion. All streams within the watershed will continue to degrade and widen and stream erosion will continue with this alternative.

Alternative 2, Tier 1 Projects. A summary of the stream impacts at each site is shown below in Table 5-3. This alternative would provide grade stabilization, headcut progression prevention, and stream restoration measures in the streams and therefore improve overall stream function, improving aquatic and terrestrial habitat and human safety. NeSCAP scores were developed and recorded for existing conditions and consideration was given during selection of measures to ensure an increase in stream function, as will be determined in future conditions NeSCAP scores during final design. Coordination with NGPC and USACE during the planning phase and extensive local experience has verified that implementing the measures outlined in the Tier 1 preferred alternative will induce improved stream function and improved habitat. Exact stream length impacts will change with final design and the projects will need to comply with Clean Water Act regulations and permitting prior to initiation of construction. Following the final designs, a post-project NeSCAP will be run to ensure a net gain in function. If a net gain function cannot be reached, a mitigation plan will be required for stream impacts. However, in order to construct any in-stream measures, water management actions (i.e. dewatering, moving water, water displacement, etc.) will need to be taken. During implementation, coordination with both USFWS and NGPC will take place to ensure minimal negative effects to the stream system conveyance. Collectively this alternative provides a major, long-term improvement to streams within the watershed.

Table 5-3. Stream Impacts, Alternative 2

ARA	Length of Stream Impacts (feet)			
	Intermittent		Perennial	
	Fill/Excavation	Inundation	Fill/Excavation	Inundation
1	-	-	465	501
3	-	-	228	-
5	-	-	59	-
6	-	248	3,595	315
7	419	-	88	-
8	586	-	-	-
9	230	1,481	-	1,248
10	-	-	482	-
11	-	-	468	-
12	-	-	1,065	-
13	-	-	157	200
Total	**1,235**	**1,729**	**6,607**	**2,264**

Alternative 2, Tier 2 Projects. It is anticipated that these alternatives will result in moderate, long-term improvements to stream function. Minor, temporary impacts will occur during and immediately after construction including some fill and inundation of streams. If there are impacts to streams or other waters of the U.S., impacts will be kept to the minimum necessary and all alternatives will need to comply with the Clean Water Act regulations and permitting prior to initiation of construction. A site-specific EE will analyze potential impacts to stream to determine potential significance and any project that decreases overall stream function will require a Supplemental EA.

5.8 Wild and Scenic Rivers

No Action Alternative. This alternative would have no direct impact to any wild and scenic rivers. It would still allow the existing level of sediment and associated nutrients to enter the wild and scenic river (Niobrara) located at the downstream end of the watershed.

Alternative 2, Tier 1 Projects. Implementation of this alternative would provide grade control to streams within the watershed and would consequently reduce stream erosion and the influx of sediment to the downstream wild and scenic river (Niobrara). Although the projects are not within the designated river corridor, they are on tributaries to the Niobrara River and would therefore require a Section 7(a) determination. Section 7(a) of the Act provides a specific standard for review of developments on a stream tributary to the designated river. Such developments may occur as long as the project "will not invade the area or unreasonably diminish the scenic, recreational, fish, and wildlife values present in the area. This standard applies to projects outside of the river corridor but on a tributary. This alternative does not invade

the designated river. This alternative does not cause diminution of the scenic, recreational, and/or fish and wildlife values of the designated river as analyzed in this document.

Alternative 2, Tier 2 Projects. Implementation of these alternatives would provide grade control to streams within the watershed and would consequently reduce stream erosion and the influx of sediment to the downstream wild and scenic river (Niobrara River). Alternatives that will be implemented along the National Rivers Inventory reach of Long Pine Creek will need to be assessed during the site-specific EE to ensure adverse effects to fish (the listed Outstandingly Remarkable Value) are avoided. These alternatives will improve stream stability, water quality, and aquatic habitat so it is not anticipated that there will be any negative impacts to Long Pine Creek. Although the projects are not within the designated river corridor, they are on tributaries to the Niobrara River and would therefore require a Section 7(a) determination. Section 7(a) of the Act provides a specific standard for review of developments on a stream tributary to the designated river. Such developments may occur as long as the project "will not invade the area or unreasonably diminish the scenic, recreational, fish, and wildlife values present in the area. This standard applies to projects outside of the river corridor but on a tributary. The site-specific EEs will ensure that the project does not invade the designated river or cause unreasonable diminution of the scenic, recreational, and/or fish and wildlife values of the designated river.

5.9 Threatened and Endangered Species

Coordination with both NRCS, USFWS, and NGPC was conducted to obtain feedback on the impacts that any of the alternatives had on streams or other bodies of water and what recommendations were offered to minimize impacts (allowing fish passage, de-watering preventatives, etc.) in order to comply with the Fish and Wildlife Coordination Act.

On October 23, 2023, both the USFWS IPaC and the NGPC CERT were run again, using the ARA boundaries created for each proposed alternative in Tier 1, to determine the list of species with habitat ranges that intersect the boundaries of the ARAs. Out of the 14 species identified in Chapter 3 (using the entire watershed as the boundary), three of those species (Interior Least Tern, Eastern Black Rail, and the Rufa Red Knot) did not appear on either report generated. These three species do not have suitable habitat that intersect the boundaries of any ARA, and result in a no effect finding.

The reports did list the remaining eleven species, and suitable habitat could exist within the boundaries of any one of the ARAs. Each species is listed below with a description of how impacts were identified, and what the initial determinations were based off of those findings. Please note that these findings are only associated with determining any significant impacts that would otherwise prevent the creation and signature of a FONSI. Consultation will need to occur with both USFWS and NGPC, through the creation of a Biological Assessment, for the preferred alternative selected, and any associated Operation and Maintenance that may be necessary, prior to any construction efforts to ensure impacts are properly avoided, minimized, or mitigated.

Eastern Black Rail

No Action Alternative. This alternative would have no effect on the Eastern black rail.

Alternative 2, Tier 1 Projects and Tier 2 Projects. This is a transient migrant that only uses Nebraska as a stopover site during its spring and fall migrations. Because of this, any proposed alternatives selected as the preferred would not significantly impact the species, and thus have no effect on the Eastern black rail.

Rufa Red Knot

No Action Alternative. This alternative would have no effect on the rufa red knot.

Alternative 2, Tier 1 Projects and Tier 2 Projects. Similar to the Eastern black rail, this species is a transient migrant that would only use Nebraska during its bi-annual migration periods. Because of this, any proposed alternatives selected as the preferred would not significantly impact the species, and thus have no effect on the rufa red knot.

Northern Long-Eared Bat

No Action Alternative. This alternative would have no effect on the Northern long-eared bat.

Alternative 2, Tier 1 Projects and Tier 2 Projects. The Northern long-eared bat range is within the ARA limits; however, there are no known hibernacula or maternity roosting sites within the ARAs or within 0.25 miles of one. Northern long-eared bats could conceivably roost underneath bark, in cavities, or in crevices in both live and dead trees that will be cleared.

As of March 31, 2023, the re-classification of this species was finalized, listing it as a federally and state endangered species. Currently, updated conservation conditions and other requirements are being discussed and have not been finalized. Because construction efforts are not anticipated prior to April 1, 2024, the Interim Consultation Framework does not apply. New guidance to avoid adverse impacts to NLEB will be issued in April of 2024. Once known, the newest conservation conditions will be implemented as necessary to avoid adverse impacts to the species. Current field observations, IPaC report, and CERT reports have identified there is suitable habitat, in the form of roosting trees, within the ARAs and no tree removal will occur during the active season or prior to new guidance scheduled to be released April 2024. The initial determination is that any proposed alternatives selected as the preferred may affect- but are not likely to adversely affect the NLEB. However, due to the guidance changes associated with this species, additional coordination and consultation will be required prior to implementation of any alternatives.

Piping Plover

No Action Alternative. This alternative would have no effect on the piping plover.

Alternative 2, Tier 1 Projects. The piping plover has a potential range along the Niobrara River at the downstream portion of the watershed. Impacts are expected to be discountable to the Niobrara River, seeing that all ARAs are located outside of the known range. Analysis of the sites concluded that not all sediment will be captured by the alternatives. Some sediment will be able to continue downstream and provide suitable habitat, such as sand blowouts and dunes, for the species. However, no official presence/absence surveys were conducted to determine if species populations were present. Because of this, a presence/absence survey will be conducted by a qualified biologist during the breeding season prior to any construction activities, If the species is found, additional consultation with both USFWS and NGPC will be required prior to commencement of project activities. The initial determination is that any proposed alternatives selected as the preferred "may affect- but are not likely to adversely affect" finding for the piping plover.

Alternative 2, Tier 2 Projects. The piping plover has a potential range along the Niobrara River at the downstream portion of the watershed. If these alternatives are to be implemented within the known range, the site-specific EE will assess the potential habitat within the project limits and any potential impacts will

be avoided, minimized, or mitigated. Consultation with USFWS will ensure that the proposed alternatives are NLAA the piping plover.

Interior Least Tern

No Action Alternative. This alternative would have no effect on the interior least tern.

Alternative 2, Tier 1 Projects. The interior least tern has a potential range along the Niobrara River at the downstream portion of the watershed. Impacts are expected to be discountable to the Niobrara River, seeing that all ARAs are located outside of the known range. Analysis of the sites concluded that not all sediment will be captured by the alternatives. Some sediment will be able to continue downstream and provide suitable habitat, such as sand blowouts and dunes, for the species. However, no official presence/absence surveys were conducted to determine if species populations were present. Because of this, a presence/absence survey will be conducted by a qualified biologist during the breeding season prior to any construction activities, If the species is found, additional consultation with both USFWS and NGPC will be required prior to commencement of project activities. The initial determination is that any proposed alternatives selected as the preferred "may affect- but are not likely to adversely affect" finding for the least interior tern.

Alternative 2, Tier 2 Projects. The species has a potential range along the Niobrara River at the downstream portion of the watershed. If these alternatives are to be implemented within the known range, the site-specific EE will assess the potential habitat within the project limits and any potential impacts will be avoided, minimized, or mitigated. Consultation with USFWS will ensure that the proposed alternatives are NLAA the interior least tern.

Western Prairie Fringed Orchid

No Action Alternative. This alternative would have no effect on the Western prairie fringed orchid.

Alternative 2, Tier 1 Projects and Tier 2 Projects. The Western prairie fringed orchid range includes the entire watershed. There is the potential for the Western prairie fringed orchid to grow within the ARAs on wet meadows and on lower stream terraces or floodplains with no cropping history and sub-irrigated soils. However, no official surveys have been conducted in any of the ARAs. A presence/absence survey will be conducted by a qualified biologist during the flowering period (June 1 – July 15) prior to any ground disturbing activities. If the species is found, additional consultation with USFWS and NGPC will be required prior to commencement of project activities. The initial determination is that any proposed alternatives selected as the preferred "may affect- but are not likely to adversely affect" finding for the Western prairie fringed orchid.

American Burying Beetle

No Action Alternative. This alternative would have no effect on the American burying beetle.

Alternative 2, Tier 1 Projects and Tier 2 Projects. The American burying beetle range includes the entire watershed. Initial site investigations suggest that suitable habitat for the species may exist in the form of prairies, open woodlands, or scrublands within any one of the ARAs. There is also the potential for ground disturbing activities to occur in these areas. However, no official surveys specific for these projects have been conducted in any of the ARAs. Because of this, additional consultation with USFWS and NGPC will be

required prior to any construction efforts. Under the 4(d) classification, this consultation will determine whether individual preferred projects are covered by the USFWS Programmatic Biological Opinion or must be assessed for impacts caused by ground disturbance not considered to be for the purpose of wildlife habitat. The initial determination is that any proposed alternatives selected as the preferred "may affect- but are not likely to adversely affect" the American burying beetle.

Blowout Penstemon

No Action Alternative. This alternative would have no effect on the blowout penstemon.

Alternative 2, Tier 1 Projects. The blowout penstemon range is within ARA 5 and 6 limits. There are no well-developed open sand blow-outs within these ARAs based off of initial site observations, which suggests that impacts to the species or any suitable habitat will be minimal. However, no official surveys have been conducted in any of the ARAs. A presence/absence survey will be conducted by a qualified biologist during the flowering period prior to any ground disturbing activities. If the species is found, additional consultation with USFWS and NGPC will be required prior to commencement of project activities. The initial determination is that any proposed alternatives selected as the preferred "may affect- but are not likely to adversely affect" finding for the blowout penstemon.

Alternative 2, Tier 2 Projects. The blowout penstemon range includes the headwaters of Sand Creek, Bone Creek, and Long Pine Creek. If these alternatives are to be implemented within the known range, the site-specific EE will assess the potential habitat within the project limits and any potential impacts will be avoided, minimized, or mitigated. Consultation with USFWS will ensure that the proposed alternatives are NLAA the blowout penstemon prior to implementation.

Whooping Crane

No Action Alternative. This alternative would have no effect on the whooping crane.

Alternative 2, Tier 1 Projects and Tier 2 Projects. The whooping crane range is within ARA limits. All alternatives are outside of densely populated residential, commercial, or industrial areas and near suitable habitat for the whooping crane such as meadows, shallow wetlands, and farm ponds. To avoid any adverse impacts, proposed work will not be implemented during the whooping crane migration periods between March 6 – April 29 and October 9 – November 15. If activities must occur during the migration period, a survey will be conducted according to the standard protocol. There will also be no work within the Niobrara River. Additional coordination efforts will take place with both USFWs and NGPC prior to implementation to identify any additional requirements. The initial determination is that any proposed alternatives selected as the preferred may affect- but are not likely to adversely affect the whooping crane.

Pallid Sturgeon

No Action Alternative. This alternative would have no effect on the interior pallid sturgeon.

Alternative 2, Tier 1 Projects and Tier 2 Projects. The species has a potential range along the Niobrara River and Missouri River, but those ranges are both located downstream of the entire watershed. Initial desktop and field analyses indicate that there will be no impacts to either rivers from either construction efforts, depletion concerns, or sediment deposition. However, because the proposed action is expected to improve stream function, additional analysis will be required to determine if proposed action improves habitat for

species downstream. Because of this, additional coordination and consultation efforts will be required with both USFWS and NGPC, using a BA as documentation, prior to any construction efforts. The initial determination is that any proposed alternatives selected as the preferred may affect- but are not likely to adversely affect the pallid sturgeon.

Finescale Dace and Northern Redbelly Dace

No Action Alternative. This alternative would have no direct effect on the finescale and northern redbelly daces.

Alternative 2, Tier 1 Projects and Tier 2 Projects. The finescale and northern redbelly daces ranges include all major streams within the watershed, including all the ARAs. Short-term adverse impacts are likely due to structure implementation. Refer to Section 5.12 below for additional information. Long- term impacts from the alternatives will be beneficial, improving water quality within streams, improving aquatic species habitat, and accommodating for fish passage. Additional consultation with NGPC will be required prior to any project or management actions/activities to ensure proper implementation of conservation measures that adequately address stream flows, sedimentation, and similar factors. The initial determination is that any proposed alternatives selected as the preferred may affect- but not likely to adversely affect determination for both the finescale dace and the Northern redbelly dace.

Small White Lady's Slipper

No Action Alternative. This alternative would have no effect on the small white lady's slipper.

Alternative 2, Tier 1 Projects. This species could have suitable habitat within any one of the ARAs, with ARA 12 being the most suitable. This includes areas adjacent to native, sub-irrigated wet meadows with sandy loam soils. Because of this, a presence/absence survey will be conducted by a qualified biologist during the flowering period (May 15th- June 7th) will be required prior to any ground disturbing activities. If the species is not found during the survey, work may proceed. If the species is found during the survey, further consultation with the NGPC will be required prior to commencement of project activities. The conservation measure will be abided by to reach a "may affect – not likely to adversely affect" finding for this species.

Alternative 2, Tier 2 Projects. Range within the watershed includes the downstream reaches of Bone and Long Pine Creeks. There is the potential for small white lady's slipper to grow within project limits of programmatic alternatives. If these alternatives are to be implemented within the known range, the site-specific EE will assess the potential habitat within the project limits and any potential impacts will be avoided, minimized, or mitigated. Consultation with NGPC will ensure that the proposed alternatives have a NLAA determination.

Monarch Butterfly

No Action Alternative. This alternative would have no effect on the monarch butterfly.

Alternative 2, Tier 1 Projects. The monarch butterfly range is within ARA limits. There is the potential for milkweed species to inhabit many areas with the ARA limits and therefore, there is the potential for suitable habitat for the monarch butterfly. The monarch butterfly is currently a candidate species. If the monarch butterfly becomes listed prior to construction, consultation with USFWS would occur and avoidance measures would be followed. Conservation measures will be taken to include milkweed species into any seeding plan to increase forage availability for the species.

Alternative 2, Tier 2 Projects. Milkweed species could inhabit multiple areas across the watershed. If these alternatives are to be implemented within the known range, the site-specific EE will assess the potential habitat within the project limits and any potential impacts. The monarch butterfly is currently a candidate species. If the monarch butterfly becomes listed prior to construction, consultation with USFWS would occur and avoidance measures would be followed. Conservation measures will be taken to include milkweed species into any seeding plan to increase forage availability for the species.

Tier 1 and Tier 2 At-Risk Fish Species

(Plains Topminnow, Western Silvery Minnow, Plains Minnow, Flathead Chub, Western Blacknose Dace, Common Shiner, & Pearl Dace)

No Action Alternative. This alternative would have no direct effect on Tier 1 and Tier 2 at-risk fish species. Continued stream degradation would decrease habitat over time.

Alternative 2, Tier 1 Projects and Tier 2 Projects. These species have potential ranges within streams in the upper reaches of the watershed. Alternatives within the upper reaches are designed to improve habitat for Tier 1 and Tier 2 species and allow for fish passage. Continued coordination with NGPC during final design and implementation will ensure the alternatives have a negligible impact or improvement to habitat for these species.

5.10 Natural Areas

No Action Alternative. No change in existing conditions.

Alternative 2, Tier 1 Projects. This alternative would have no direct impact to natural areas. All project sites are located on streams that have been influenced by human intervention. ARA 12 is located directly downstream of natural areas protected by NGPC and would provide grade control to protect the streams within the upstream natural areas.

Alternative 2, Tier 2 Projects. These alternatives could provide a direct, moderate, long-term improvement to natural areas if implemented on NGPC property or within Long Pine Creek. Alternatives are designed to improve aquatic habitat and improve stream stability, which will improve water quality and stream health within natural areas.

5.11 Riparian Areas

No Action Alternative. The streams within the ARAs are experiencing continual degradation, widening, and erosion. All streams within the ARAs will continue to degrade and widen and threaten riparian habitat.

Alternative 2, Tier 1 Projects. This alternative would provide a long-term, moderate improvement to riparian areas by providing grade control and streambank protection to stabilize streams and protect from further loss of riparian areas within the ARAs. This alternative additionally will improve approximately 5.4 acres of riparian area at ARA 11 by re-establishing vegetation in riparian areas that currently consist of deposited sand. Some minor, temporary impacts are expected to occur during construction. All areas impacted by construction will be re-seeded with native vegetation.

Alternative 2, Tier 2 Projects. This alternative would provide a long-term, moderate improvement to riparian areas by providing grade control and streambank protection to stabilize streams and protect from further

loss of riparian areas within the watershed. Some minor, temporary impacts could occur during construction. All areas impacted by construction practices will be re-seeded with native vegetation.

5.12 Fish & Wildlife Habitat

No Action Alternative. No change in existing conditions.

Alternative 2, Tier 1 Projects and Tier 2 Projects. These alternatives would improve in-stream fish habitat by implementing in-stream habitat improvement measures such as cross-vanes, w-weirs, and cedar revetments. The combination of these in-stream habitat projects reduces drop heights to accommodate fish passage and creates favorable habitat for fish species through creation of pools and habitat cover. This alternative would additionally provide grade control along streams, enhancing overall stream function and consequently improve in-stream fish habitat. There will be minor tree impacts from tree removal for access, however, most trees are invasive cedar trees and will result in negligible impacts. There will also be minor, temporary impacts to aquatic species due to construction of in-stream projects. Measures to reduce adverse impacts will be implemented during construction, including the use of industry-accepted best management practices to minimize and contain erosion during construction, vegetating areas of disturbance with native species, ensuring designs accommodate aquatic species passage where needed, and timing of construction to avoid critical reproductive periods as described in Sections 5.9 and 5.14. Overall, this alternative provides a moderate, long-term improvement to fish habitat and results in minor, temporary adverse impact to woodland and agricultural wildlife habitats.

5.13 Biologically Unique Landscapes

No Action Alternative. No change in existing conditions.

Alternative 2, Tier 1 Projects. This alternative is located outside of biologically unique landscapes and would therefore have no direct effect on biologically unique landscapes.

Alternative 2, Tier 2 Projects. Programmatic alternatives could occur along Long Pine Creek, within the Middle Niobrara BUL. Site-specific EEs will ensure that alternatives do not result in any negative impacts to this landscape besides potential minor, temporary impacts during construction. Overall, these alternatives are designed to improve aquatic habitat and improve stream stability and will provide a negligible to moderate improvement.

5.14 Migratory Birds and Eagles

No Action Alternative. This alternative would have no impact on migratory birds or eagles.

Alternative 2, Tier 1 Projects. Based off of the IPaC report ran on the ARAs, 9 total species of migratory birds can potentially nest in this area and are listed below.

- Black-billed Cuckoo (*Coccyzus erythropthalmus*)
- Bobolink (*Dolichonyx oryzirorus*)
- Chimney Swift (*Chaetura pelagica*)
- Lark Bunting (*Calamospiza melanocorys*)
- Lesser Yellowlegs (*Tringa flavipes*)

- Pectoral Sandpiper (*Calidris melanotos*)
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)

Because of the species listed above, any alternative selected as the preferred would have to avoid any habitat destruction during the nesting and breeding season for the species present. If any type of habitat destruction must occur during these times, bird surveys would be conducted (5 days prior to scheduled construction activities) to ensure compliance with the Migratory Bird Treaty Act. Conservation measures will also be implemented during the construction phase to limit impacts to habitat such as re-establishing vegetation cover, use of erosion blankets, watering down soil to prevent erosion, manage artificial lighting, etc.

Based off of results gathered from the IPaC report, bald eagles and golden eagles are known to occur within any one of the ARAs. Eagle surveys will be conducted within 0.5 miles of each alternative selected as the preferred during the leaf-off (dormant season), prior to construction. If any eagles are nesting in the area, consultation with USFWS and NGPC will take place prior to any construction efforts. These alternatives are not likely to adversely impact migratory birds or bald eagles.

Alternative 2, Tier 2 Projects. Suitable habitat for both migratory birds and eagles can be observed across the watershed. Site-specific EEs will ensure that alternatives do not result in any negative impacts to this landscape besides potential minor, temporary impacts during construction.

5.15 Archaeological and Historic Properties

Section 106 of the NHPA [54 U.S.C. § 306108] and its implementing regulations, "Protection of Historic Properties" [36 CFR part 800] requires Federal agencies to determine whether their undertakings will have an adverse impact on historic properties that are listed on or are eligible for listing on the National Register of Historic Places and to afford the Advisory Council on Historic Preservation a reasonable opportunity to provide comment. In compliance with Section 106 of the NHPA, consulting parties were identified including Indian tribes that might attach religious and cultural significance to historic properties within the area of potential effect (APE). For a list of Tribes contacted during original scoping, see Section 6.1 in this document. Seven additional Tribes were contacted after the original consultation was complete. These include the following: Apache Tribe of Oklahoma, Cheyenne & Arapaho Tribes of Oklahoma, Cheyenne River Sioux Tribe, Crow Creek Sioux Tribe of the Crow Creek Reservation, Lower Brule Sioux Tribe, Oglala Sioux Tribe, and Standing Rock Sioux Tribe of North and South Dakota. The public was afforded an opportunity to provide input on cultural resources during the February 18th and August 6th, 2020, and the April 28th, 2021, public meetings. The APE for each Tier 1 project location was surveyed for the presence of historic properties by a professional consultant who meets the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44739). Cultural resource investigations were completed in late November and early December 2020.

No Action Alternative. There would be no Federal Action, and no immediate change to the surrounding lands. No further NHPA compliance would be required. Because human habitation on the Plains is greatly influenced by access to water resources, it can be inferred that cultural resources within the study area could be impacted by untreated streambank erosion.

Alternative 2, Tier 1 Projects. A cultural resource inventory of the 11 Tier 1 project locations identified two windmills, two farmsteads, and one Native American occupation site with the APE. Only one of these resources, the Native American occupation site, has been determined eligible for inclusion in the NRHP. This historic property is not located in the immediate vicinity of any of the proposed streambank restoration structures or access roads and will be avoided during construction. NRCS determined that no historic properties would be affected by the proposed Tier 1 projects and consulted on the findings of the cultural resource inventory report with the Nebraska State Historic Preservation Office (SHPO) and the Tribes listed in Section 10.0. The Nebraska SHPO concurred with NRCS's determination of effect in a letter received June 28, 2021. The Pawnee Nation of Oklahoma responded in a letter dated June 15, 2021, stating that the Native American site recorded during the survey was considered to be ancestral Pawnee, but the project should not affect the cultural landscape of the Pawnee Nation so long as that site was protected from disturbance during construction. No other responses were received.

It is possible that construction activities could result in disturbance to unknown cultural resources through accidental discovery depending on the extent of the resources and their proximity to structures and access roads. If cultural resources are inadvertently discovered during construction, a stop work order will be issued until the resources can be evaluated by a professional archeologist. NRCS will notify the State Historic Preservation Officer, consulting tribal governments, and the Advisory Council on the Historic Preservation. NRCS will act as prescribed in NRCS GM 420, Part 401, to protect or recover any significant cultural resources discovered during construction.

Alternative 2, Tier 2 Projects. As there is not sufficient information regarding the location and types of structures that will be built under the Tier 2 alternatives, NRCS cannot make a determination of effect regarding the impacts of the Tier 2 alternatives on historic properties. In accordance with 36 CFR 800.14(b)(1)(ii), NRCS and the Nebraska SHPO have entered into a Programmatic Agreement to govern the implementation of the Tier 2 alternatives and the Pawnee Nation of Oklahoma has signed as a concurring party. A copy of the Programmatic Agreement outlining the procedures NRCS and MNNRD must follow to ensure no adverse effects to archeological and historic properties can be found in Appendix E.

5.16 Environmental Justice

No Action Alternative. This alternative would not adversely impact minority groups.

Alternative 2, Tier 1 Projects and Tier 2 Projects. These alternatives will not adversely impact any known minority groups or individuals living in poverty. No private property will be taken without just compensation and no relocations are anticipated for this alternative. The community and landowners will benefit from stream stabilization.

5.17 Public Health and Safety

No Action Alternative. Risks to public safety from high and eroding stream banks will continue and likely worsen as stream banks continue to degrade and widen. High and steep stream banks, especially near public infrastructure and roads, pose a risk to human safety. This watershed has a history of loss of bridges and culverts due to large storm events and inadequate protection. This alternative leaves the watershed vulnerable to more infrastructure loss and risk to human health and safety.

Alternative 2, Tier 1 Projects. This alternative would stabilize the stream banks and gullies within the ARAs to minimize degradation and erosion and therefore provide a moderate, permanent improvement to public safety in and near the streams within and upstream of the project areas. This will also prevent Bone Creek from encroaching on a local residence and infrastructure at ARA 12, lowering the risk to loss of life and damage to infrastructure.

Alternative 2, Tier 2 Projects. Alternatives that do not provide grade control or bank stabilization have a negligible effect on public health and safety. Alternatives that include grade control and bank stabilization features have the potential to result in negligible to major, permanent improvements to public health and safety.

5.18 Recreation

No Action Alternative. This alternative would not provide any recreation to the ARAs or improve recreation within the watershed.

Alternative 2, Tier 1 Projects. This alternative would improve in-stream fish habitat within streams, resulting in improved fishing within surrounding waterbodies. This alternative would additionally provide an approximately 6-acre pool upstream of the proposed sill at ARA 6 that will provide passive recreational benefits for fishing.

Alternative 2, Tier 2 Projects. Alternatives improve in-stream fish habitat within streams, resulting in improved fishing within surrounding waterbodies.

5.19 Invasive Species

No Action Alternative. This alternative would have no impact on invasive species.

Alternative 2, Tier 1 and Tier 2 Projects. This alternative will include measures to limit the spread and introduction of invasive species. Measures will include limiting disturbed areas to only what is necessary for the design footprint and construction and use of native seed mixtures to seed disturbed. This alternative would have an overall negligible impact on invasive species.

5.20 Floodplain Management

No Action Alternative. This alternative would have no impact on floodplain management.

Alternative 2, Tier 1 and Tier 2 Projects. There are no FEMA mapped floodplains (flood insurance rate maps) within the watershed. Projects are for watershed protection and are intended to maintain floodplain connectivity and will provide erosion protection, flow direction, bank stabilization, and aquatic habitat improvement. By maintaining natural floodplain connectivity, potential future impacts downstream due to channel degradation are reduced. Measures like ponds and sediment and water control basins will induce minor flooding in the immediate vicinity of the structures. These are designed to ensure floodplain impacts are not transferred to adjacent landowners. This alternative would have an overall negligible impact on floodplain management.

5.21 Ecosystem Services

The sections below describe impacts to ecosystem services for each alternative.

5.21.1 Provisioning Services

Provisioning services include tangible goods provided for direct human use and consumption. Within this watershed, these include resources directly related to food production (prime and unique farmland) as well as those that indirectly impact food production (erosion and sedimentation, water quality and quantity, streams, riparian areas, and fish and wildlife habitat) and other human uses, such as genetic resources (threatened and endangered species, migratory birds, and biologically unique landscapes).

No Action Alternative. This alternative would have a minor, long-term impact to provisioning services. Continued stream degradation and widening would lead to the direct loss of prime and unique farmland that is used for food production (crop and pasture). Erosion and sedimentation would continue to increase, impacting production and water quality. Degradation of riparian areas, streams, and fish and wildlife habitat could also lead to decreased food production (fish, game).

Alternative 2, Tier 1 and 2 Projects. This alternative would provide a minor improvement to provisioning services. Arresting the existing degradation and widening will ensure productive land is not lost. Fish and wildlife habitat, including streams and riparian areas, will be improved and lead to a more productive landscape. Protecting the biologically unique landscapes will also secure sensitive genetic resources for future human use.

5.21.2 Regulating Services

Regulating services maintain a world in which it is possible for people to live and provide critical benefits that buffer against environmental catastrophe. For the scope of this analysis, these include resources related to land loss/gain (erosion and sedimentation, public health and safety) and control of disease, nutrients, and protection against excess water/drought (water quality, water quantity, wetlands, streams, and riparian areas).

No Action Alternative. This alternative would have a moderate, long-term effect on regulating services. Continued stream erosion would lead to a direct loss of land, causing increased concerns for public health and safety and less protection against future storm events. Loss of wetlands and degradation of streams would reduce water filtration and could leave the watershed susceptible to drought due to the lowering of the water table.

Alternative 2, Tier 1 and 2 Projects. This alternative would provide a moderate, long-term benefit to regulating services. Stream stability will lead to major improvements to public health and safety. Improvements to riparian areas, protection of wetlands, and protection of stream grade will all provide resiliency to flooding, drought, and impacts to water quality.

5.21.3 Supporting Services

Supporting services refer to the underlying processes that maintain conditions for life. In this watershed, resources include biologically unique landscapes, fish and wildlife habitat, and streams (nutrient and sediment cycling).

No Action Alternative. This alternative would have a moderate, long-term impact on supporting services. Stream degradation and widening lead to major impacts to fish and wildlife habitat and leave streams in disequilibrium.

Alternative 2, Tier 1 and 2 Projects. This alternative would provide a moderate, long-term improvement to supporting services. Measures that promote stream stability will enable streams and sediment cycling to move toward quasi-equilibrium and provide improvements to fish and wildlife habitat.

5.21.4 Cultural Services

Cultural services make the world a place in which people want to live. Recreation and natural landscapes are important aspects of this watershed and include fishing, water recreation, hiking, hunting, and appreciation of wildlife. Resources such as wetlands, streams, birds, fish, wildlife, and natural areas all have aspects related to cultural services.

No Action Alternative. This alternative would have a minor, long-term impact to cultural services. Continued degradation of streams and to existing fish and wildlife habitat would decrease aesthetics and recreational use.

Alternative 2, Tier 1 and 2 Projects. This alternative would provide a minor, long-term benefit to cultural services. Measures that improve aquatic habitat will improve esthetics, recreation, and provide social value. Measures that address stream stability will improve habitat and provide protection to recreation and aesthetic resources for the future.

5.22 Indirect Effects

Indirect effects are those that are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable (40 CFR 1508.8). These can be positive or negative and can include effects to the human socioeconomic environment and/or the natural environment. An indirect effect of the no action alternative would be continued stream degradation, resulting in increased bank instability and channel widening. This would also result in loss of land, loss of production, and increased maintenance costs for producers. A major, long-term negative indirect effect of continued stream degradation as a result of Alternative 1 is a loss of habitat to sensitive species in the watershed headwaters, specifically impacting the Finescale Dace and Northern Redbelly Dace. Alternative 2 and programmatic alternatives will provide grade control, bank protection, and reduced future channel degradation and widening and will therefore provide an indirect moderate, long-term benefit to prime farmland and any natural areas adjacent to streams as well as the Middle Niobrara BUL.

5.23 Cumulative Impacts

Cumulative impacts are defined by the Council on Environmental Quality (CEQ) as:

> the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (40 CFR 1508.7).

These impacts include both the direct and indirect impacts of the proposed project with any other projects that have happened in the past or could reasonably happen in the future. Reasonably foreseeable actions must have progressed far enough through planning or design so that they are likely to be carried out. The

framework provided in CEQ's "Considering Cumulative Effects under the National Environmental Policy Act" was consulted for this analysis. As is discussed in the aforementioned framework, a method to discern cumulative impacts is to assess potential resources affected by the proposed action, to look at other past or future projects that could also impact those resources, and to analyze the locations and timeframes of those actions to determine if cumulative impacts are present.

Actions occurring within the watershed were considered for this analysis. Specific actions occurring within the watershed include culvert and bridge replacements, stream stability projects funded through other agencies and sources, and habitat improvement projects. Impacts to stream stability, wetlands, and streams were identified as the primary resources to consider. Stream functionality and aquatic and riparian habitat in the watershed is highly impaired and therefore stream stabilization and aquatic habitat improvement projects in this region generally provide an improvement to ecological function, habitat, and biological diversity. Any additional stream stabilization projects will provide an overall benefit to watershed streams and surrounding land.

No cumulative impacts are anticipated to historic properties.

5.24 Compliance with Federal, State, and Local Laws

The following permit and compliance requirements must be met for construction of the Project to occur. As mentioned above, in order to construct any in-stream measures, water management actions (i.e. dewatering, moving water, water displacement, etc.) will need to be taken. During implementation, coordination with both USFWS and NGPC will take place to ensure minimal negative effects to the stream system conveyance.

- **Clean Water Act Section 404.** CWA Section 404 permits must be obtained from the USACE to account for fills within jurisdictional waters of the United States prior to construction. The Sponsor will obtain a 404 permit for each project prior to construction. It is anticipated that a Nationwide Permit (NWP) 27 will be sufficient to permit the measures at each site. A pre-construction (PCN) notification will be required. The NWP 27 requires a 5-year monitoring plan, per USACE Regulatory. If the projects do not meet the intended functional lift, monitoring will be required for a longer period of time. Monitoring status reports (led by the Sponsor) will be available for any agency upon request. Following the final designs, a post-project NeSCAP will be run to ensure a net gain in function. If a net gain function cannot be reached, a mitigation plan will be required for stream impacts. Additionally, CWA Section 401 compliance may require additional coordination and consultation with EPA through NDEE on state resource waters.
- **Migratory Bird Treaty and Bald/Golden Eagle Acts.** To avoid migratory bird nesting impacts, construction activities will be avoided nesting and breeding seasons (refer to Chapter 3). Additionally, conservation measures will be implemented during the construction phase to limit impacts to habitat such as re-establishing vegetation cover, use of erosion blankets, watering down soil to prevent erosion, manage artificial lighting, etc. If any construction measures must occur during this time, a field survey will be conducted 5 days before any construction activities occur to ensure compliance with the Migratory Bird Treaty Act. If migratory bird species are found, additional consultation with both USFWS and NGPC will be required prior to construction. Additionally, because bald eagles are known to occur within any one of the ARAs, eagle surveys

will be conducted within 0.5 miles of each alternative selected as the preferred during the leaf-off (dormant season), prior to construction. If bald eagles are nesting in the area, consultation with USFWS and NGPC will take place prior to any construction efforts. Initial coordination and consultation efforts with USFWS suggested that new rules and permitting regulations are being proposed for both the Migratory Bird Treaty Act and Bald/Golden Eagle Act. Changes are expected to take affect prior to implementation of any one project. NRCS acknowledges that additional coordination and consultation will be required with USFWS, with a BA as documentation, to determine if a take permit will be required.

- **Endangered Species Act, Nongame and Endangered Species Conservation Act, and Fish and Wildlife Coordination Act.** Though conferences have been held with both USFWS and NGPC regarding impacts and initial determinations to listed species, no official concurrence will be awarded until the next phase of the project, when the designs are 100% completed. At that time, consultation with both agencies will be required to further analyze impacts to listed or proposed species. A Biological Assessment will be required to compile and document any impacts, determinations, surveys, or additional information required for each alternative selected as the preferred prior to any concurrence.

  Additionally, coordination with both USFWS and NGPC has indicated that the Plan-EA complies with the Fish and Wildlife Coordination Act by reducing impacts to stream channels and improving the system as a whole through restoration and stabilization efforts.

- **Wild and Scenic Rivers Act.** Although the projects are not within the designated river corridor, they are on tributaries to the Niobrara River and would therefore require a Section 7(a) determination. Section 7(a) of the Act provides a specific standard for review of developments on a stream tributary to the designated river. Such developments may occur as long as the project "will not invade the area or unreasonably diminish the scenic, recreational, fish, and wildlife values present in the area".

- **NDEE.** A National Pollutant Discharge Elimination System (NPDES) construction storm water permit from the Nebraska Department of Environment and Energy (NDEE) will be required at each site if more than 1-acre of land is disturbed for construction.

- **Dust Regulations.** Nebraska Title 129, Chapter 15 Section 003 fugitive dust regulations shall apply to all excavation and construction activities.

- **Excavation.** All applicable regulations in Nebraska Title 128 and Title 132 must be followed. Any solid or hazardous wastes generated or discovered during project operations must be properly handled, contained, disposed, and (if necessary) characterized. No waste permit required.

- **National Historic Preservation Act.** Section 106 of the NHPA [54 U.S.C. § 306108] and its implementing regulations, "Protection of Historic Properties" [36 CFR part 800] requires Federal agencies to determine whether their undertakings will have an adverse impact on historic properties that are listed on or are eligible for listing on the National Register of Historic Places and to afford the Advisory Council on Historic Preservation a reasonable opportunity to provide comment In compliance with Section 106 of the NHPA, the Nebraska SHPO and Indian Tribes with ancestral ties to the project area were contacted early in the planning process to identify the presence of

properties of historic, religious, and cultural significance within the study area and to participate in agency scoping meetings. For a list of Tribes contacted see Section 6.1. The public was afforded an opportunity to provide input during the February 18 and August 06, 2020, and the April 28, 2021, public meetings. The APE for each Tier 1 project location was identified and surveyed for the presence of historic properties by professional archeologists who meet the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44739). Cultural resource investigations were completed in late November and early December 2020 (Bevitt and Bevitt 2021). One historic property was identified within the APE but is located away from all areas of proposed ground disturbance and access roads. In accordance with 36 CFR 800.4(4)(d)(1), NRCS determined that no historic properties would be affected by Tier 1 project construction. Because the Tier 2 phase projects have not yet been surveyed for cultural resources, NRCS could not make a determination of effect regarding the construction of the Tier 2 phase of this undertaking and identified the necessity to develop a programmatic agreement in accordance with 36 CFR 800.14(b)(1)(ii). NRCS consulted on its determination of effect with the Nebraska SHPO and the Tribes listed in Section 6.1 and invited the consulting parties to participate in the development of a programmatic agreement in letters sent in May 2021. Nebraska SHPO concurred with the determination of effect and accepted the invitation to develop a programmatic agreement in a letter received June 28, 2021. The Pawnee Nation of Oklahoma responded in a letter dated June 15, 2021, stating that the Native American site recorded during the survey was considered to be ancestral Pawnee, but the project should not affect the cultural landscape of the Pawnee Nation so long as that site was protected from disturbance during construction. No other responses were received. A copy of the programmatic agreement is available in Appendix E. The agreement document outlines the NHPA Section 106 process that will be followed for Tier 2 phase projects including the completion of additional cultural resource inventories and future consultation requirements.

- **Operation and Maintenance.** An O&M Plan will be prepared using the NRCS National Operation and Maintenance Manual.
- **National Environmental Policy Act.** This document was prepared to comply with the National Environmental Policy Act and the Principles, Requirements, and Guidelines for Water and Related Land Resources Implementation Studies.

5.25 Possible Conflicts with Plans and Policies

No potential conflicts between land use plans, regional water resource management plans, policies, or controls for the area were identified.

5.26 Risk and Uncertainty

Each alternative contains risk factors and uncertainty values that could involve changes in costs and benefits. Costs, including operations and maintenance, were based on a design life of 20 years. Significant events, like those that occurred in 2019, can impact project life and maintenance costs. Sedimentation rates were calculated using existing land use and conditions. Land use could change and therefore increase or decrease these rates and urbanization can cause a rapid influx of sediment into the basin. Costs, including land values, were determined by engineer estimates for project implementation and were based on local

experience and engineering judgement. Potential mitigation costs for Tier 2 projects were considered based on Tier 1 analysis and local knowledge. All estimated costs and benefits are subject to change due to local, regional, or world economics. These uncertainties were not considered for this analysis.

5.26.1 Climate Change

Climate change in Nebraska could result in an increase in extreme storm events (UNL, 2014), leading to increased flooding and an increase in stream degradation rates. All regulations were followed in the design of the pond and sediment basin. In addition, stream banks at the grade stabilization and sill structures are protected up to the 100-year flood event. Overall, Alternative 2 and programmatic alternatives increase climate change resiliency within the watershed by protecting streams from headcut progression and stream degradation.

5.26.2 Land Use

Land use is projected to continue to remain predominantly agricultural and pastureland in most of the watershed. All alternatives brought forward for detailed analysis support both existing and projected future land use and therefore will have a negligible effect.

5.26.3 Adaptive Management

Adaptive management can be a useful tool to reduce uncertainty and maximize goals. Stream grades, meanders, and geometry can change and headcuts can form and migrate quickly, especially with extreme events or in response to a human-induced change. The watershed protection alternatives were analyzed with an understanding that these changes could occur between the planning process and final design and implementation. ARAs were determined and kept broad enough for individual grade stabilization structure locations to adjust to potential changes and resource impacts were determined and analyzed conservatively. Uncontrollable changes to stream profile and banks during the implementation timeline as well as survey completed during the final design phase may modify the planned design and footprint at grade stabilization sites. Sill protection into the banks of the grade control and sill structures may need to be adjusted based on the predicted future meanders of the channel. These changes are expected due to the fluid nature of stream dynamics and are not anticipated to impact the outcome of the included environmental assessment or economic analysis.

5.27 Precedent for Future Actions with Significant Impacts

Implementation of the proposed action does not set a precedent for future actions with significant impacts. Future projects would be analyzed by their own circumstances and evaluated for effects based on resources of concern identified during the scoping process.

5.28 Controversy

There have been no areas of controversy identified. The planning process included public meetings, coordination with interested agencies and groups, and printed public information to raise issues, resolve conflicts, and recommend the most desirable plan features. Comments were generally in-favor at all project sites and landowner recommendations and preferences were considered and utilized when possible. Landowners were individually consulted with the preferred alternative components on their property to ensure they were no controversies with local landowners. The Plan-EA's preferred alternative is also the locally preferred alternative.

6.0 CONSULTATION, COORDINATION, AND PUBLIC PARTICIPATION

The following section details agency and public participation efforts throughout the planning process. Additional internal consultation and coordination took place between the Sponsor, NRCS, and NGPC throughout the planning process. See Appendix D for a summary of information received from NGPC and considered throughout the planning process. A cooperating agency letter from USACE is included in Appendix A. Consultation letters from SHPO and the Pawnee Nation of Oklahoma are also included in Appendix A. An online website with the primary project contact information, project meeting information, and relevant project information was additionally made available to keep the public informed and address any concerns they may have had throughout the planning process.

6.1 Scoping Meeting

The Sponsor held agency and public scoping meetings on February 18, 2020, to provide information to the public about the Project and to gather comments that may be relevant to the scoping process. Summaries of the meetings are included in Sections 6.1.1 and 6.1.2 below. The Sponsor also held a scoping meeting with, local and state NRCS, Brown County, National Park Service, and the Ainsworth Irrigation District in November 2019 to discuss problems and opportunities within the watershed and to identify potential resource concerns.

6.1.1 Agency Scoping Meeting (February 18, 2020)

An agency scoping meeting for the Plan-EA was held on February 18, 2020, from 3:30pm – 4:30pm at the Ainsworth Community Building in Ainsworth, Nebraska. This meeting was held during business hours to accommodate agency staff. Letters and a project location figure were sent to members of the following agencies.

- Ainsworth Irrigation District
- Brown County
- Bureau of Reclamation
- Cherry County
- City of Ainsworth
- Federal Emergency Management Agency
- MNNRD
- National Park Service
- Nebraska Department of Environment and Energy
- Nebraska Department of Natural Resources
- Nebraska Department of Transportation
- Nebraska Game and Parks Commission
- Nebraska State Historic Preservation Office
- NRCS
- Office of the Governor
- Omaha Tribe of Nebraska
- Pawnee Nation of Oklahoma
- Ponca Tribe of Indians of Oklahoma
- Ponca Tribe of Nebraska
- Rock County
- Rosebud Sioux Tribe
- Sandhills Task Force
- Santee Sioux Nation of Nebraska
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Geological Survey - Nebraska Water Science Center
- Yankton Sioux Tribe

The Sponsor, state NRCS staff, engineering consultants, and representatives from NGPC, Sandhills Task Force, Brown County, and the National Park Service, were in attendance. An overview of the project was presented and included information about the project background and the NEPA planning process. Time

was allotted for the public to ask questions and to address concerns from the agencies. Additional Tribes were contacted after the original scoping meeting. The list of these Tribes can be found in Section 5.15.

6.1.2 Public Scoping Meeting (February 18, 2020)

A public scoping meeting was held on February 18, 2020, from 5:30 – 7:30pm at the Ainsworth Community Building in Ainsworth, Nebraska. This meeting was held after business hours to accommodate the public. Letters about the meeting were mailed to landowners adjacent to major streams within the watershed and a notice about the meeting was posted in local newspapers. This public meeting included an open house and presentation to provide an overview of the planning process, discuss any concerns, and begin an open line of communication with the public. An overview of the project was presented and included information about the project background and the NEPA planning process. Time was allotted for the public to ask questions and to address concerns from the public. Posters of the areas within the watershed were provided for the public to physically mark the areas they would like to see addressed within the Plan-EA. A poster with the potential resources of concern was also provided to receive feedback about the resources the public is most concerned about and would like to see the Plan-EA to focus on. An information sheet was also available to provide additional information about the Plan-EA.

6.2 Public and Agency Coordination

The Sponsor had additional coordination with the public and agencies in addition to the scoping meetings to keep them informed and address any concerns they may have throughout the planning process. Additional coordination is described below.

6.2.1 Public and Agency Meeting (August 6, 2020)

The Sponsor planned virtual public meeting for August 6, 2020. Adhering to the Centers for Disease Control Prevention (CDC) recommendation to cancel large gatherings due to the Coronavirus Disease 2019 (COVID-19), the public meeting held on August 6, 2020, was held via conference call. An overview of the project was presented and included information about the project background, purpose, field data collection and analysis, and potential alternatives and practices. The presentation from the meeting was posted on the project website for the public to view. The public was notified of the presentation and paper copies of the information as well as additional project information was made available upon request.

6.2.2 Landowner Letters (February 23, 2021)

The Sponsor mailed out letters to each landowner with proposed projects located on their property on February 23, 2021. The letters provided an overview of the project and an overview of the proposed project components located within their property. The letters included contact information to schedule a call to discuss the proposed project, answer any questions or concerns, and to discuss any potential project modifications. Projects were adjusted based on the conversations with landowners to ensure that they were in favor of the preferred alternative.

6.2.3 Public and Agency Meeting (April 28, 2021)

The Sponsor planned online and in-person public and agency meetings for April 28, 2021, at the Ainsworth Community Building in Ainsworth, Nebraska. The meetings provided an overview of the preferred alternative, environmental consequences, and the planning process. The public was notified of the online

presentation and paper copies of the information as well as additional project information was made available upon request.

6.2.4 Informal Conference with USFWS and NGPC (November 1, 2023)

An informal conference was held in early November 2023 to gather a list of species that needed to be analyzed for impacts and to discuss the potential adverse impacts that any of the proposed alternatives have on any of the listed, candidate, or proposed species provided by either agency.

7.0 THE PREFERRED ALTERNATIVE

7.1 Rationale for the Preferred Alternative

Two alternatives were analyzed in detail during project formulation and Alternative 2 provides the most ecosystem service benefits, best meets the Federal Objective, is the locally preferred alternative, and is the least costly socially and environmentally acceptable method of achieving the project purpose. Therefore, Alternative 2 has been agreed upon as the Preferred Alternative. Determination of measures within Alternative 2 included an economic and cost effectiveness analysis utilizing an interdisciplinary team to determine economic and resource trade-offs, including the human consideration. The nature and scope of the problem, including the threshold for analysis, was determined at each location/reach and measures were identified and analyzed to identify the measures to be included within the Preferred Alternative. Ecosystem trade-offs for the alternatives analyzed in detail are shown in Tables 4-5 and 4-6, economic tables for the preferred alternative are provided at the end of this chapter, and additional information on the alternatives analysis can be found in Chapter 4.0. See Appendix D and E for additional information about the investigation and analysis of the preferred alternative, including the cost-effectiveness analysis.

7.2 Measures to be Installed

The preferred alternative is made up of projects which are divided into Tier 1 and Tier 2 project phases based on implementation timing. Both are described below.

7.2.1 Tier 1 Projects

Tier 1 of the proposed action includes grade stabilization structures, a stream crossing, a pond, a sediment control basin, streambank protection, and critical area planting. Grade stabilization and stream crossing structures were chosen with special consideration to aquatic organism passage and improved aquatic habitat. The Tier 1 phase of the preferred alternative is shown in Table 7-1 and described below. Additional information about the investigation and analysis of the preferred alternative is included in Appendix D. Due to availability of quality riprap and watershed location, South Dakota Department of Transportation (SDDOT) gradation specifications (SDDOT, 2015) were used to perform stability calculations and therefore all riprap described below is assumed to follow these specifications.

Table 7-1. The Preferred Alternative, Tier 1 Projects

ARA	Practice Type	Description	Name
1	Restoration structure with grade stabilization (410)	Cross vane	G2-41-1
		Cross vane	G2-41-2
		W-Weir	G2-41-3
	Grade stabilization (410)	Sill	G2-42
3	Grade stabilization (410)	Rock ramp	G2-43
	Grade stabilization (410)	Zeedyk structure (log and fabric) in gully	G2-44
5	Stream crossing (578)	Flexamat® crossing (or approved alternative)	SC2-1
6	Grade stabilization (410)	Zeedyk structure (rock rundown) in gully	G2-2-1
	Grade stabilization (410) & Aquatic organism passage (396)	Sill with fish passage	G2-2-2
7	Restoration structure with grade stabilization (410)	Cross vane	G2-3-1
		Cross vane	G2-3-2

ARA	Practice Type	Description	Name
		W-Weir	G2-3-3
		Cross vane	G2-3-4
	Pond (378)	Pond in gully	P2-4
	Water & sediment control basin (638)	Sediment basin in gully	G2-5
	Restoration structure with grade stabilization (410)	Cross vane	G2-3-5
		Cross vane	G2-3-6
	Restoration structure with streambank & shoreline protection (580)	Bendway weir	BS2-6-1
		Bendway weir	BS2-6-2
		Bendway weir	BS2-6-3
	Grade stabilization (410)	Rock ramp with grout for crossing	G2-7
8	Grade stabilization (410)	Rock ramp	G2-8-1
	Grade stabilization (410)	Rock ramp	G2-8-2
9	Grade stabilization (410)	Sill	G2-9-1
	Grade stabilization (410)	Sill	G2-9-2
	Grade stabilization (410)	Sill	G2-9-3
10	Streambank & shoreline protection (580)	Cedar revetments	BS2-30
	Grade stabilization (410)	Rock ramp	BS2-31
11	Grade stabilization (410)	Rock chute	G2-32
	Grade stabilization (410)	Sill	G2-33
	Critical Area Planting (342) & Obstruction Removal (500)	Debris removal and planting of floodplain bench	CP2-34
12	Grade stabilization (410)	Rock ramp	G2-70
	Streambank & shoreline protection (580)	Streambank protection near home	BS2-71
	Streambank & shoreline protection (580)	Streambank protection near bridge	BS2-72
13	Streambank & shoreline protection (580)	Toe protection near home	BS2-45
	Grade stabilization (410)	Rock ramp	G2-46

Restoration structures include cross-vanes, w-weirs, and bendway weirs and are designed to provide channel stability and improved aquatic habitat. The cross-vanes and w-weirs are both in-stream grade stabilization structures designed to provide grade stabilization and also redirect flows toward the center of the channel to protect from streambank erosion. These structures improve aquatic habitat by providing smoother drops and creating pools for aquatic species. Bendway weirs are channel defining structures designed to redirect water from the channel banks. Typical sections and design details are provided in Appendices C and D.

Sill structures were designed to reclaim lost streambed grade and provide grade stabilization benefits. The sill heights vary at each location and are based on desired grade reclamation, approximate existing and future stream slopes, and potential to impact flooding upstream of each structure. The sill has an upstream slope of 3H:1V, 15-foot top width, and 3-foot-thick Class C riprap. The sill's side slopes, depth of side slope riprap protection, and back slope were determined based on riprap stability calculations to ensure stable slopes for SDDOT Class C riprap. The discharge of the 100-year flood event or top of bank, whichever is lower, was used for the riprap stability analysis. Stream banks are to be graded back at a 3:1 ratio upstream of the rock structure to allow stream flow to naturally expand without hitting the channel banks and transitioned back towards the existing channel downstream of the structures at a 1:1 ratio based on stream flow's typical contraction ratio. The locations of the sills were selected to fit within natural floodplains when

applicable to reduce excavation quantities. Field measurements and 2016 LiDAR were used for the preliminary design costs. The proposed design details are provided in Appendix C.

Rock ramps are designed for long term stability, low maintenance, and resilience of future infrequent runoff events and are designed to deform to "catch" future headcuts and maintain future drops as they progress upstream. The structures include SDDOT Class C rock riprap that will be placed along the stream channel bottom and partially up the banks to a height of half the top of bank elevation for the upstream portion of the structure. Riprap will be placed up to the top of bank at the downstream sill. The width of the structure was set to ensure a stable slope with SDDOT Class C riprap with the discharge of the 100-year flood event or at the top of bank, whichever is lower. The structures vary in length based on the projected impending headcut depth and excavation along channel banks will occur throughout the structure to achieve a 2H:1V channel bank slope. Channel banks will be graded back at a 3:1 ratio upstream of the rock structure to allow stream flow to naturally expand without hitting the channel banks and transitioned back towards the existing channel downstream of the structures at a 1:1 ratio based on stream flow's typical contraction ratio. See Appendix C for a plan and profile view of the rock ramps and plan views at each site.

Zeedyk structures are smaller hand-built structures designed to manage gully erosion and channel incision. These consist largely of natural material such as trees and rocks. The proposed Zeedyk structures consist of a log and fabric structure and rock rundown. Both structures are proposed in small, eroding gullies to protect the gully from eroding further upstream. Typical sections and design details are provided in Appendices C and D.

A **Flexamat® (or approved alternative) crossing** (SC2-1) is proposed near the headwaters of Sand Draw Creek within ARA 5 to provide a stream crossing, to prevent the migration of an existing headcut, to help maintain floodplain connectivity, and to provide aquatic habitat improvements. The proposed crossing uses a vegetated tied concrete block mat (Flexamat® or an approved alternative) and is designed to allow for vehicles to cross the stream while still allowing for fish passage. Typical sections and design details are provided in Appendices C and D.

A sill with fish passage (structure G2-2-2) is proposed to provide grade stabilization benefits, create an approximate 6-acre permanent pool with a minimum pool depth of 2-feet, improve floodplain connectivity and aquatic habitat, and provide passage for aquatic organisms. A spillway with a 5-foot-wide channel along the center is designed at the permanent pool elevation to go around the embankment and designed to accommodate fish and other aquatic organism passage. Burst speeds of target species (those that are listed as threatened or endangered as well as Tier 1 and Tier 2 at-risk fish species) were considered to avoid creating an impediment to fish travel. The weakest target species have a burst speed of approximately 2 feet/second and therefore the spillway was graded to account for this. Any modifications during final design will ensure fish passage is accounted for. The sill includes a 4-foot-tall earthen embankment with turf reinforcement matting to protect the embankment from erosion during the 100-year storm event. The preliminary design details are provided in Appendix C and more detailed information is provided in Appendix D.

A **pond** (structure P2-4) is proposed on a gully that flows to Sand Draw Creek to provide grade control and water quality benefits. The pond was designed in accordance with NRCS Conservation Practice Standard (CPS) Code 378. The permanent pool was set to store approximately 50-years of sediment. A 20-foot-wide

auxiliary spillway is set at the 10-year, 24-hour storm elevation and the top of dam was set to detain a 50-year, 24-hour storm. The pond embankment will be a 10-foot-tall earthen embankment with a 10H:1V backslope to reduce erosion potential and associated maintenance. Typical sections and design details are provided in Appendices C and D.

A **water and sediment control basin** (structure G2-5) is proposed on a gully to provide grade control to protect the gully from further degradation. The storage pool elevation was set to retain approximately 20-years of sediment. The storage pool is designed to drain continuously and not contain permanent inundation. The sediment basin does not include an auxiliary spillway and the top of the embankment was with the 25-year, 24-hour storm event. The proposed sediment basin consists of a seeded earthen embankment with a maximum height of 5-feet at the lowest point along the centerline. A 10H:1V backslope on the embankment is proposed to protect the embankment from erosion and reduce required maintenance. Typical sections and design details are provided in Appendices C and D.

Cedar revetments (structure BS2-30) are proposed for the primary purpose of providing streambank stabilization. The location of the cedar revetment was selected within ARA 10 to protect the adjacent wetland and associated habitat features and to also protect the adjacent steep channel banks from eroding and causing further pastureland loss. Cedar revetments include wiring together two rows of cedar trees and anchoring the trees into the channel bank. See Appendix C for plan views and details of the proposed structure. Cedar revetments provide secondary benefits by providing a variety of aquatic habitat benefits and are recommended due to the high success of previously implemented cedar revetment projects in the area, as detailed in the 1991 RCWP.

A **rock chute** (G2-32) is proposed to provide grade control and protection at an existing headcut and steep slope within ARA 12. Excavation along channel banks will occur throughout the structure to achieve 3H:1V channel bank slopes and riprap will be placed up to the design discharge elevation. To protect against future stream meanders, the structures are toed-in on the upstream side with rock that is buried 25 feet perpendicular to the bank on each side. The length of these will be adjusted in final design according to more detailed analysis of the probability of future stream meanders. See Appendix C for a cross-sectional and plan and profile view of the rock chute design and Appendix D for additional information.

Large flood events in 2019 caused massive degradation and widening throughout the watershed and caused the transition of pastureland to large areas of deposited sand and large woody debris. One of these areas along Bone Creek is the proposed location for **debris removal and critical area planting** (CP2-34) to restore approximately 5.3 acres of floodplain to provide bank stabilization, improved habitat, and improved downstream water quality. This alternative includes removing debris and obstructions, bringing in suitable organic material for plant growth, and seeding the area. Appendix D includes additional information.

Streambank protection is proposed along the toe in ARA 13, adjacent to a home on the top of a steep bank (BS2-45). The home will be threatened if streambank erosion and widening continues. Riprap is currently being used along portions of the slope and the toe protection is proposed to provide additional stability to protect the streambank from eroding closer to the home. The toe protection consists of Class C riprap buried into the streambank above the stream's ordinary high-water mark and halfway up the bank. See Appendix C for a plan and profile view of the proposed toe protection.

The 2019 flood events cut off a meander in Bone Creek at ARA 12, shifting the stream nearly 600-feet north and eroding the streambank to within 150-feet of a home and within 70-feet of other infrastructure. The events also caused the destruction of an existing bridge and the progression of a 5-foot deep headcut. **Streambank protection** is proposed, including a 5-foot tall, 1,000-foot-long earthen fill and Class C rock riprap sill (BS2-71) that runs parallel to the degrading channel bank to protect the bankline from further degradation and loss of land. The sill is designed to deform and maintain protection if the stream continues to migrate towards the property and extends past the southern bend to protect the bank on the downstream end. This protection was designed to adequately protect during the 100-year event. A **rock ramp** is also proposed at ARA 12 (G2-70) to provide upstream protection from the impending headcut. The destroyed bridge was replaced by the landowner in 2020 and buried flank protection (BS2-72) is proposed just upstream of the bridge to protect the right pier. Class C riprap will be buried in the uplands and will launch if channel migration approaches the bridge. Plan and profile details and locations of the proposed structures are included in Appendix D.

7.2.2 Tier 2 Projects

Tier 2 locations were determined based on desktop and field analysis and input from stakeholders. Costs of Tier 2 locations were based on detailed analysis of Tier 1 locations. Identified Priority 1 and 2 Tier 2 locations are listed below in Table 7-2.

Table 7-2. Preferred Alternative, Tier 2 Projects (Priority 1 and 2)

Site or Reach	Name	Description	Priority	Anticipated NRCS Codes
Site	Tier2-BS2-3	Bank stabilization with cedars that were removed	1	580
Reach	Tier2-BS2-43	Grade control, bank stability, bank stability at house. NDOT has project upstream.	1	410, 580
Reach	Tier2-BS2-51	Bank stability	1	580
Site	Tier2-BS2-60	Bridge out, bank instability (within ARA 14)	1	580
Site	Tier2-BS-32	Oxbow restoration/habitat improvements, bank stability	1	395, 580, 582
Site	Tier2-BS-35	Bank stabilization near house	1	580
Reach	Tier2-G2-33	Restoration with grade control, oxbow restoration (within ARA 10)	1	410, 582
Site	Tier2-G2-40	Protect road and cowboy trail, grade control, habitat improvements	1	410, 584
Site	Tier2-G2-41	Grade control for Willow Creek and northern tributary	1	410, 580
Site	Tier2-G2-42	Protect AID crossing	1	410
Site	Tier2-G2-45	Grade control, headcut moving up tributary	1	410
Site	Tier2-H2-2	Headwater excavation, improve habitat	1	646, 659
Site	Tier2-IW2-90A	Weather Station	1	449
Site	Tier2-IW2-90B	Weather Station	1	449
Site	Tier2-IW2-90C	Weather Station	1	449
Site	Tier2-IW2-90D	Weather Station	1	449
Site	Tier2-IW2-90E	Weather Station	1	449
Site	Tier2-IW2-90F	Weather Station	1	449
Site	Tier2-IW2-91A	Automated Gate	1	587

Site or Reach	Name	Description	Priority	Anticipated NRCS Codes
Site	Tier2-IW2-91B	Automated Gate	1	587
Site	Tier2-S2-44	Grade control in gully (prefer permanent water)	1	638
Site	Tier2-SC2-31	Stream crossing out	1	578
Reach	Tier2-G2-1	Grade control, habitat improvements	2	410, 584
Reach	Tier2-G2-10	Restoration with grade control, habitat improvements	2	410, 584
Reach	Tier2-G2-20	Restoration with grade control, habitat improvements	2	410, 584
Reach	Tier2-G2-30	Habitat improvements, grade control, bank stability	2	395, 410, 580, 584
Reach	Tier2-G2-34	Grade control (large) to protect upstream	2	410
Reach	Tier2-G2-50	Watershed BMPs to reduce erosion, Restoration with grade control, habitat improvements	2	395, 410, 580, 584
Reach	Tier2-G2-80	Grade control, bank stability, infrastructure protection (bridge)	2	410
Reach	Tier2-H2-52	Habitat improvements, grade control, bank stability	2	410, 582, 584, 395

Priority 1 and 2 Tier 2 locations are shown below in Figures 7-1 and 7-2.

Figure 7-1. Tier 2 Locations

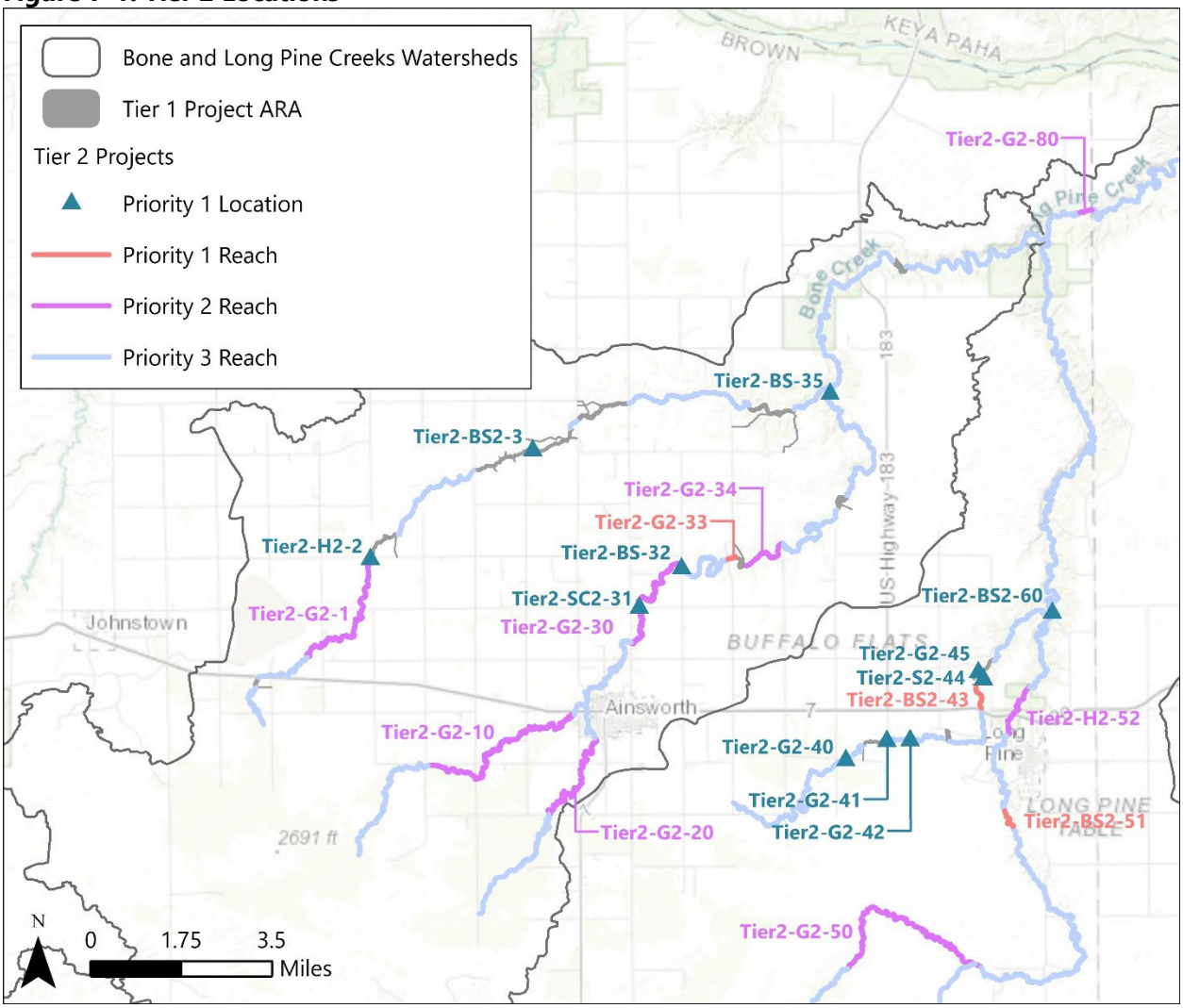
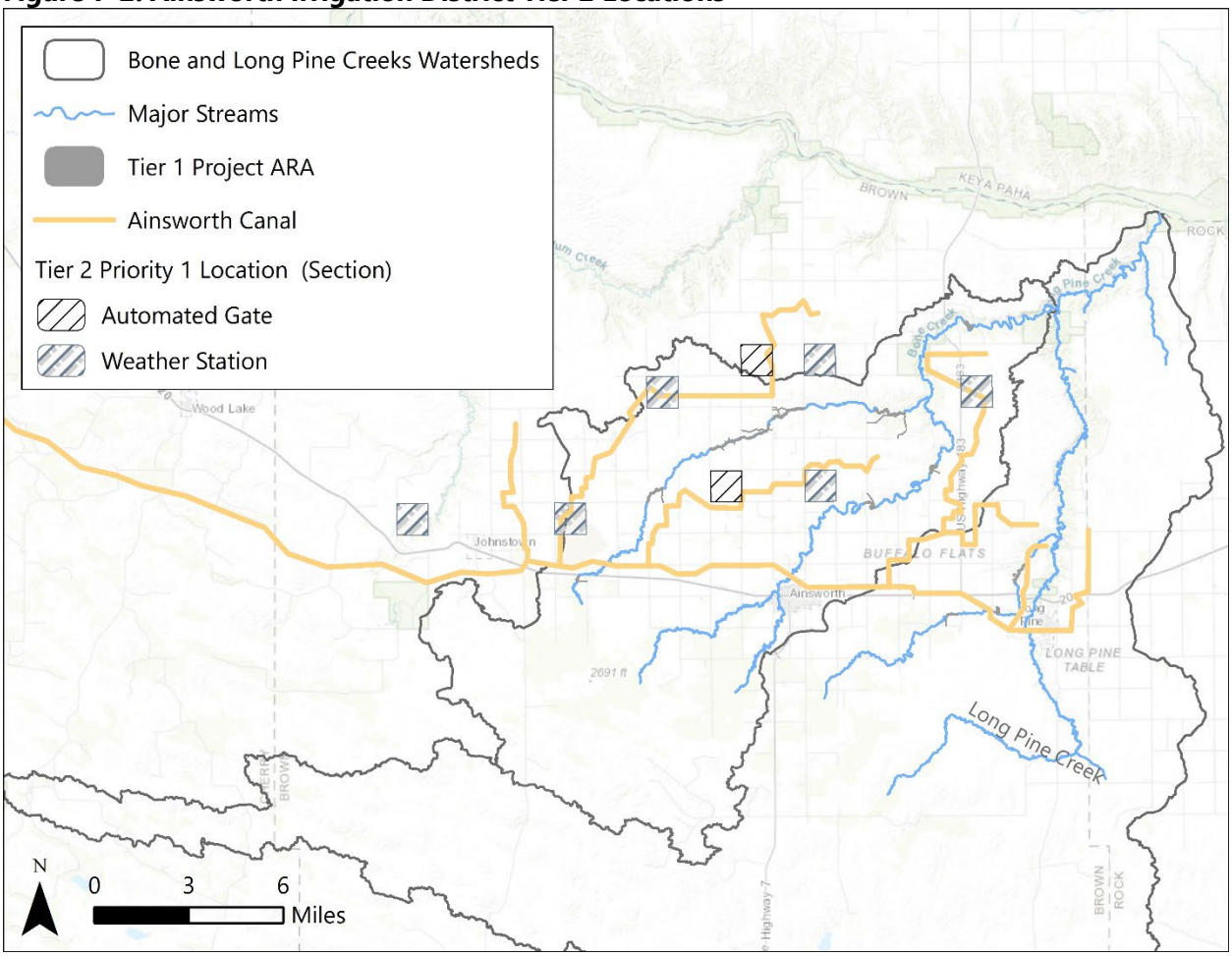


Figure 7-2. Ainsworth Irrigation District Tier 2 Locations



7.3 Mitigation

There will be minor adverse impacts to some wildlife habitat and other sensitive resources during project installation. Impacts to wildlife habitats include streams and wetlands expected to be permanently lost to construction within project extents. Field surveys were conducted within the ARAs to determine the quantities of wetlands and streams that will be impacted by implementation of the Plan.

Every effort was made to minimize and avoid impacts to sensitive resources. Locations were chosen to help minimize impacts to wetlands and to provide protection to wetlands when possible. Disturbance limits were limited to those necessary for structure placement and access roads are planned to avoid disturbing riparian habitat as much as possible. Creation of open water habitat, improved stream function, and protected wetlands will all be a result of the proposed action.

Mitigation requirements were determined in conjunction with NRCS specialists and based on USACE Regulatory requirements of similar, recent projects within Nebraska. Any land needed for mitigation measures (if required) will be located at or near the sites and the designated mitigation areas will be fenced to manage or prevent livestock grazing. All required mitigation will be the responsibility of the Sponsor.

Any mitigation associated with the Tier 2 phase would be identified through the EE process and become part of the implementation requirements. The Programmatic Agreement found in Appendix E will direct investigations and mitigation for cultural resources.

7.3.1 Wetland Mitigation, Tier 1

The preferred alternative would result in a loss of 0.38-acres of wetlands. Compensatory wetland mitigation is not anticipated due to individual site loss limits and overall improvements to stream function and aquatic habitat. USACE Individual Permits (IPs) are not anticipated for any structure or project location with the Plan. Mitigation bank credits are not available in the service area where impacts would occur and therefore on-site compensatory mitigation is proposed if compensatory mitigation is required. Wetlands are predicted to establish approximately 2-feet vertically above and below the permanent pool elevation at G2-2-2 and wetlands will be protected throughout the watershed due to the proposed measures.

7.3.2 Stream Mitigation, Tier 1

The preferred alternative would result in stream improvements throughout the watershed. It will provide grade stabilization and streambank protection benefits, which will result in increased stream function and habitat. There will be some stream impacts from earthen and riprap fill, earthen excavation, and inundation from in-stream structures. Approximately 2,810-feet of intermittent stream and 8,608-feet of perennial stream is expected be impacted due to fill, excavation, and inundation for the preferred alternative. However, the projects are expected to provide a functional lift after implementation of the proposed action.

Total fill impacts consisting of earthen fill, rock riprap, and Flexamat® is estimated at 1,020-feet of intermittent stream and 2,610-feet of perennial stream. Inundation impacts from the sills is estimated at 1,730-feet of intermittent stream and 5,540-feet of perennial stream. These streams are generally low functioning and highly degraded or in danger of becoming degraded due to impending headcuts. These features have a purpose to maintain or restore functional integrity to the stream reaches they impact.

The Nebraska Stream Condition Assessment Procedure (NeSCAP) was performed for streams for existing conditions within each ARA and the NeSCAP results are included in Appendix E. This procedure will also be followed for future, proposed conditions as part of final design to ensure a functional lift at each project site and therefore no stream mitigation is anticipated.

7.4 Permits and Compliance

The following permit and compliance requirements must be met for construction of the Project to occur.

- **Clean Water Act Section 404.** CWA Section 404 permits must be obtained from the USACE to account for fills within jurisdictional waters of the United States prior to construction. The Sponsor will obtain a 404 permit for each project prior to construction. It is anticipated that a Nationwide Permit (NWP) 27 will be sufficient to permit the measures at each site for both Tier 1 and Tier 2 projects. A pre-construction (PCN) notification will be required. The NWP 27 requires a 5-year monitoring plan, per USACE Regulatory. If the projects do not meet the intended functional lift, monitoring will be required for a longer period of time. Monitoring status reports (led by the Sponsor), will be available for any agency upon request. Following the final designs, a post-project NeSCAP will be run to ensure a net gain in function. If a net gain function cannot be reached, a

mitigation plan will be required for stream impacts. Additionally, CWA Section 401 compliance may require additional coordination and consultation with EPA through NDEE on state resource waters.

- **Migratory Bird Treaty and Bald/Golden Eagle Acts.** To avoid migratory bird nesting impacts, construction activities will be avoided nesting and breeding seasons (refer to Chapter 3). Additionally, conservation measures will be implemented during the construction phase to limit impacts to habitat such as re-establishing vegetation cover, use of erosion blankets, watering down soil to prevent erosion, manage artificial lighting, etc. If any construction measures must occur during this time, a field survey will be conducted 5 days before any construction activities occur to ensure compliance with the Migratory Bird Treaty Act. If migratory bird species are found, additional consultation with both USFWS and NGPC will be required prior to construction. Additionally, because bald eagles are known to occur within any one of the ARAs, eagle surveys will be conducted within 0.5 miles of each alternative selected as the preferred during the leaf-off (dormant season), prior to construction. If bald eagles are nesting in the area, consultation with USFWS and NGPC will take place prior to any construction efforts. Initial coordination and consultation efforts with USFWS suggested that new rules and permitting regulations are being proposed for both the Migratory Bird Treaty Act and Bald/Golden Eagle Act. Changes are expected to take affect prior to implementation of any one project. NRCS acknowledges that additional coordination and consultation will be required with USFWS, with a BA as documentation, to determine if a take permit will be required.

- **Endangered Species Act, Nongame and Endangered Species Conservation Act, and Fish and Wildlife Coordination Act.** Though conferences have been held with both USFWS and NGPC regarding impacts and initial determinations to listed species, no official concurrence will be awarded until the next phase of the project, when the designs are 100% completed. At that time, consultation with both agencies will be required to further analyze impacts to listed or proposed species. A Biological Assessment will be required to compile and document any impacts, determinations, surveys, or additional information required for each alternative selected as the preferred prior to any concurrence.

  Additionally, coordination with both USFWS and NGPC has indicated that the Plan-EA complies with the Fish and Wildlife Coordination Act by reducing impacts to stream channels and improving the system as a whole through restoration and stabilization efforts.

- **Wild and Scenic Rivers Act.** Although the projects are not within the designated river corridor, they are on tributaries to the Niobrara River and would therefore require a Section 7(a) determination. Section 7(a) of the Act provides a specific standard for review of developments on a stream tributary to the designated river. Such developments may occur as long as the project "will not invade the area or unreasonably diminish the scenic, recreational, fish, and wildlife values present in the area".

- **NDEE.** A National Pollutant Discharge Elimination System (NPDES) construction storm water permit from the Nebraska Department of Environment and Energy (NDEE) will be required at each site if more than 1-acre of land is disturbed for construction.

- **Dust Regulations.** Nebraska Title 129, Chapter 32 fugitive dust regulations shall apply to all excavation and construction activities.
- **Excavation.** All applicable regulations in Nebraska Title 128 and Title 132 must be followed. Any solid or hazardous wastes generated or discovered during project operations must be properly handled, contained, disposed, and (if necessary) characterized. No waste permit required.
- **National Historic Preservation Act.** Section 106 of the NHPA [54 U.S.C. § 306108] and its implementing regulations, "Protection of Historic Properties" [36 CFR part 800] requires Federal agencies to determine whether their undertakings will have an adverse impact on historic properties that are listed on or are eligible for listing on the National Register of Historic Places and to afford the Advisory Council on Historic Preservation a reasonable opportunity to provide comment In compliance with Section 106 of the NHPA, the Nebraska SHPO and Indian Tribes with ancestral ties to the project area were contacted early in the planning process to identify the presence of properties of historic, religious, and cultural significance within the study area and to participate in agency scoping meetings. For a list of Tribes contacted see Section 6.1. The public was afforded an opportunity to provide input during the February 18 and August 06, 2020, and the April 28, 2021, public meetings. The APE for each Tier 1 project location was identified and surveyed for the presence of historic properties by professional archeologists who meet the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (48 FR 44739). Cultural resource investigations were completed in late November and early December 2020 (Bevitt and Bevitt 2021). One historic property was identified within the APE but is located away from all areas of proposed ground disturbance and access roads. In accordance with 36 CFR 800.4(4)(d)(1), NRCS determined that no historic properties would be affected by Tier 1 project construction. Because the Tier 2 phase projects have not yet been surveyed for cultural resources, NRCS could not make a determination of effect regarding the construction of the Tier 2 phase of this undertaking and identified the necessity to develop a programmatic agreement in accordance with 36 CFR 800.14(b)(1)(ii). NRCS consulted on its determination of effect with the Nebraska SHPO and the Tribes listed in Section 6.1 and invited the consulting parties to participate in the development of a programmatic agreement in letters sent in May 2021. Nebraska SHPO concurred with the determination of effect and accepted the invitation to develop a programmatic agreement in a letter received June 28, 2021. The Pawnee Nation of Oklahoma responded in a letter dated June 15, 2021, stating that the Native American site recorded during the survey was considered to be ancestral Pawnee, but the project should not affect the cultural landscape of the Pawnee Nation so long as that site was protected from disturbance during construction. No other responses were received. A copy of the programmatic agreement is available in Appendix E. The agreement document outlines the NHPA Section 106 process that will be followed regarding Tier 2 phase projects including the completion of additional cultural resource inventories and future consultation requirements.
- **Operation and Maintenance.** An O&M Plan will be prepared using the NRCS National Operation and Maintenance Manual.

- **National Environmental Policy Act.** This document was prepared to comply with the National Environmental Policy Act and the Principles and Guidelines for Water and Related Land Resources Implementation Studies.

7.5 Costs and Cost Sharing

This Project received 100 percent funding for planning through the P.L. 83-566 Watershed and Flood Prevention Operations (WFPO) program. It is anticipated that 100 percent of design costs and approximately 75 percent of total construction costs will also be funded by the WFPO program for all Tier 1 and 2 projects. The Sponsor will be responsible for all permitting costs. The availability of Federal funds is contingent upon appropriations available for this purpose.

A description of the costs and cost sharing for the preferred alternative and tiered projects are included below. Economic Tables 1, 2, and 4 are included at the end of this chapter.

7.5.1 Construction

Construction costs include all costs to build the preferred alternative and tiered projects, including mitigation. Major components include mobilization, riprap, excavation, and fill. Economic Tables 1, 2, and 4 provided at the end of this chapter summarize construction costs and cost share and Tier 1 project costs are included in Appendix D. NRCS P.L. 83-566 funds would pay 75 percent of the total construction costs based on current rates of assistance for similar practices under other existing NRCS conservation programs.

7.5.2 Engineering

Engineering costs include final design of the preferred alternative and tiered projects, surveys, geotechnical investigations, construction observation, and permit acquisition. The Sponsor is responsible for 100 percent of the permit acquisition costs. Engineering costs are based on engineering judgement and similar projects within the state. Construction observation costs are estimated at 10 percent of the construction cost. NRCS would provide 88 percent of funding for costs of engineering, which is 100 percent of engineering costs minus permitting. See economic Tables 1, 2, and 4 at the end of this chapter and Appendix D for a summary of engineering costs and cost share.

7.5.3 Real Property Acquisition and Easements

The Sponsor is responsible for 100 percent of real property acquisition and easements. Easements for construction and maintenance access will be required for project implementation. Similar projects within the watershed have obtained easements for construction and maintenance access at no cost due to the landowner benefits and limited footprints. Close coordination during the planning process with landowners throughout the watershed, including those within the identified ARAs, revealed they are also willing to provide construction and maintenance easements at no cost due to the benefits and limited footprints. Therefore, it is assumed that there are no costs for real property rights associated with this project. No relocations are anticipated.

7.5.4 Operation and Maintenance

Costs of operation and maintenance of the measures is based on experience from similar structures and is included at 0.75 percent of the construction cost. Replacement costs are included for structures that have a design life less than the project life. The Sponsor is responsible for 100 percent of the operation and maintenance costs for the planned life of the structures. Maintenance costs include items such as seeding,

repair of riprap after large events, minimal grading, and other maintenance requirements. Additionally, any associated Operation and Maintenance that will be necessary following construction of the proposed action to ensure any additional impacts are properly avoided, minimized, or mitigated. See Economic Tables at the end of this chapter and Appendix D for a summary of operations and maintenance costs and cost share.

7.5.5 Project Administration

Project administration is estimated based on local experience. Project administration includes project oversight and review, contract administration and supervision, and checking installation measures to ensure the proposed and installed works meet NRCS criteria. The Sponsor would be required to provide 100 percent of funding for its own administrative costs. See economic Table 2 at the end of this chapter and Appendix D for a summary of project administration cost and cost share.

7.6 Installation and Financing

7.6.1 Framework for Carrying out the Plan

Final design for all Tier 1 sites would occur in the year 2022 and 2023. Construction would occur over a 5-year period for Tier 1 sites. Environmental evaluations (EE) for Tier 2 sites would follow the framework outlined in Chapter 5 of this document. EEs and final design for Priority 1 and 2 Tier 2 sites would occur in the first 5 years and construction would occur over a 9-year period. Priority 3 Tier 2 sites would be completed as funding allows and needs are identified.

Table 7-3a and 7-3b show the distribution of estimated total project costs for Tier 1 and Priority 1 and 2 Tier 2 sites.

Table 7-3a. Distribution of Total Project Costs, Installation of Preferred Alternative (Tier 1)

Project Costs	P.L. 83-566 Funds	Other Funds	Total
Construction[1]	$3,630,400	$1,239,700	$4,870,100
	75%	25%	100%
Engineering[2,3]	$1,694,200	$ 241,900	$1,936,100
	88%	12%	100%
Real Property Rights	$0	$0	$0
	0%	100%	100%
Project Administration	$169,100	$169,100	$338,200
	50%	50%	100%
Total Project	$5,493,700	$1,650,700	$7,144,400
	77%	23%	100%

[1]Includes mitigation and replacement costs *[2]Includes construction observation*
[3]Includes permit acquisition

Table 7-3b. Distribution of Total Project Costs, Installation of Preferred Alternative (Tier 2, Priority 1 and 2)

Project Costs	P.L. 83-566 Funds	Other Funds	Total
Construction[1]	$4,834,300	$1,611,200	$6,445,500
	75%	25%	100%
Engineering[2,3]	$2,578,500	$315,100	$2,893,600

	89%	11%	100%
Real Property Rights	$0	$0	$0
	0%	100%	100%
Project Administration	$225,900	$225,900	$451,800
	50%	50%	100%
Total Project	$7,638,700	$2,152,200	$9,790,900
	78%	22%	100%

[1]*Includes mitigation*

[2]*Includes construction observation*

[3]*Includes permit acquisition*

7.6.2 Planned Sequence of Installation

Table 7-4 depicts the timeline for Tier 1 projects within the preferred alternative. The Sponsor has taxing authority for project funding and the power of imminent domain if needed.

Table 7-4. Preferred Alternative Timeline (Tier 1)

Action	Timeframe
Final Design, all sites	2023
Construction at ARAs 5, 8, 11 & 12	2023-2024
Construction at ARAs 9, 10, 13	2024
Construction at ARAs 1, 3, 7	2025
Construction at ARA 6	2026

Presumed sequence of final design and installation of Tier 2 projects (Priority 1 and 2) are included in Table 7-5.

Table 7-5. Preferred Alternative Timeline (Tier 2, Priority 1 and 2)

Final Design	Construction	Name
2023	2023 – 2024	Tier2-BS2-51
	2023 – 2024	Tier2-IW2-90A
	2023 – 2024	Tier2-IW2-90B
	2023 – 2024	Tier2-IW2-91A
	2023 – 2024	Tier2-IW2-90E
	2023 – 2024	Tier2-IW2-90C
	2023 – 2024	Tier2-IW2-90F
	2023 – 2024	Tier2-IW2-90D
	2023 – 2024	Tier2-IW2-91B
2023	2024	Tier2-G2-33
	2025	Tier2-BS2-43
	2026	Tier2-G2-42
	2026	Tier2-G2-40
	2026	Tier2-SC2-31
	2026	Tier2-G2-45

Final Design	Construction	Name
	2025	Tier2-BS2-3
	2024	Tier2-BS-35
2024	2026	Tier2-BS2-60
	2026	Tier2-H2-2
	2026	Tier2-BS-32
	2025	Tier2-G2-41
	2026	Tier2-S2-44
2026	2028	Tier2-G2-20
	2029 - 2030	Tier2-G2-50
	2028	Tier2-G2-10
	2028	Tier2-G2-1
	2030 -2031	Tier2-G2-34
	2029 - 2030	Tier2-G2-30
	2027	Tier2-H2-52
	2027	Tier2-G2-80

7.6.3 Responsibilities

The Sponsor is responsible for obtaining all permits and ensuring compliance as identified in Section 7.4, Permits and Compliance. In addition, the Sponsor is responsible for obtaining all easements required for project implementation. The Sponsor has analyzed their financial needs and is able to make funds available when needed. Federal funds are to be provided by NRCS for 100 percent of final design and a portion of construction through the Watershed and Flood Prevention Operations program. Federal funds are to be provided for project administration, technical assistance, and construction observation as well. The availability of Federal funds is contingent upon appropriations available for this purpose. Prior to entering into agreements that obligate funds of NRCS, the Sponsor will have a financial management system for control, accountability, and disclosure of P.L. 83-566 funds received and for control and accountability for property and other assets purchased with P.L. 83-566 funds.

7.6.4 Contracting

Each site will be constructed through project agreements between the NRCS and the Sponsor by means of Federal contract procedures and resultant contracts. The Sponsor intends to facilitate contracting.

7.6.5 Financing

The Sponsor has the power and authority to levy taxes, issue revenue bonds for the purpose of financing authorized construction facilities, and to exercise the power of eminent domain. Any costs for easements, permits, and mitigation are the responsibility of the Sponsor.

7.6.6 Conditions for Providing Assistance

The estimated cost of installing Tier 1 and Priority 1 and 2 Tier 2 sites is $16,935,300. The NRCS, under authority of the Watershed Protection and Flood Prevention Act, Public Law 566, as amended, will provide

$7,052,600. The Sponsor, using other authorities and private funds, will provide approximately $4,871,300. Federal financial assistance for construction is contingent upon appropriations for this purpose.

7.7 Operation, Maintenance, and Replacement

Operation includes the administration, management, and performance of non-maintenance actions needed to keep the structures safe and functioning as planned. Maintenance includes performance of work to prevent deterioration of practices and repair damage of the structures if one or more of their components fail. Damages to a completed structure caused by normal deterioration, droughts, or flooding caused by rainfall in excess of design rainfall, or vandalism are considered maintenance. Replacement and dredging costs are included for structures with a design life less than the project life (G2-1, G2-2-2, G2-44).

Structures in this Plan-EA will be operated and maintained by the Sponsor with technical assistance from Federal, state, and local agencies in accordance with their delegated authority. A specific Operations and Maintenance (O&M) plan would be prepared using the NRCS National Operation and Maintenance Manual for each site. The Sponsor obligation for Federal O&M on a work of improvement is complete when the measure reaches its evaluated life. However, the Sponsor may have continued O&M responsibilities in order to remain in compliance with applicable Federal, State, and local laws, regulations, and ordinances and a separate O&M agreement would be developed before construction of each site in this case. The agreement would provide for inspections, reports, and procedures for performing the maintenance items. The agreement would include specific provisions for retention, use, and disposal of property acquired or improved with federal assistance. The term of this new O&M agreement would be for a period equivalent to the life expectancy of each project.

The structures are to be inspected by the Sponsor on a regularly scheduled basis; during or immediately following major storms or other occurrences that may adversely affect the structure and appurtenant works. A vigorous stand of vegetation shall be maintained on the vegetated banks at the grade stabilization structures. All gullies in the bank shall be filled and reseeded as necessary. Rock riprap that is displaced shall be replaced and woody debris deposited on the toe rock shall be removed. Problems that may occur affecting the project area shall be repaired in a timely manner.

The estimated average annual operation and maintenance costs are included in Table 4.

TABLE 1
Estimated Installation Costs
Bone and Long Pine Creeks Watershed, NE
(Dollars) 1/

Works of Improvement	Non-Federal land 2/	Estimated cost (dollars) 1/		
		Public Law 83-566 Funds	Other Funds	Total
Tier 1 Projects	All	5,493,700	1,650,700	7,144,400
Tier 2 Projects (Priority 1 and 2)	All	7,638,700	2,152,200	9,790,900
Total		13,132,400	3,802,900	16,935,300

1/ Price base: 2022 Prepared: 06/2022

2/ Only nonfederal land is involved in this project

TABLE 2 – Tier 1 Sites

Estimated Cost Distribution

Structural Measures

Bone and Long Pine Creeks Watershed, NE

(Dollars) 1/

Works of Improv.	ARA	Structure Name	Installation Cost-Public Law 83-566					Installation Cost - Other funds					Total
			Construction	Engineering 2/	Real Property Rights	Project Admin	Total Public Law 566	Construction 3/	Engineering 2/4/	Real Property Rights	Project Admin	Total Other	Installation Costs
Tier 1 Sites	1	G2-41-1	28,500	13,300	0	1,300	43,100	9,500	1,900	0	1,300	12,700	55,800
		G2-41-2	28,500	13,300	0	1,300	43,100	9,500	1,900	0	1,300	12,700	55,800
		G2-41-3	33,200	15,500	0	1,600	50,300	11,100	2,200	0	1,600	14,900	65,200
		G2-42	85,700	40,000	0	4,000	129,700	28,600	5,700	0	4,000	38,300	168,000
	3	G2-43	128,600	60,000	0	6,000	194,600	42,900	8,600	0	6,000	57,500	252,100
		G2-44	3,200	1,500	0	200	4,900	7,500	200	0	200	7,900	12,800
	5	SC2-2	43,000	20,100	0	2,000	65,100	14,300	2,900	0	2,000	19,200	84,300
	6	G2-2-1	1,500	700	0	100	2,300	3,500	100	0	100	3,700	6,000
		G2-2-2	59,600	27,800	0	2,800	90,200	39,900	4,000	0	2,800	46,700	136,900
	7	G2-3-1	34,000	15,900	0	1,600	51,500	11,300	2,300	0	1,600	15,200	66,700
		G2-3-2	34,000	15,900	0	1,600	51,500	11,300	2,300	0	1,600	15,200	66,700
		G2-3-3	39,700	18,500	0	1,900	60,100	13,200	2,600	0	1,900	17,700	77,800
		G2-3-4	20,200	9,400	0	900	30,500	6,700	1,300	0	900	8,900	39,400
		P2-4	24,400	11,400	0	1,100	36,900	8,100	1,600	0	1,100	10,800	47,700
		G2-5	5,200	2,400	0	200	7,800	1,700	300	0	200	2,200	10,000
		G2-3-5	20,200	9,400	0	900	30,500	6,700	1,300	0	900	8,900	39,400
		G2-3-6	20,200	9,400	0	900	30,500	6,700	1,300	0	900	8,900	39,400
		BS2-6-1	5,000	2,300	0	200	7,500	1,700	300	0	200	2,200	9,700
		BS2-6-2	5,000	2,300	0	200	7,500	1,700	300	0	200	2,200	9,700
		BS2-6-3	5,000	2,300	0	200	7,500	1,700	300	0	200	2,200	9,700
		G2-7	91,400	42,700	0	4,300	138,400	30,500	6,100	0	4,300	40,900	179,300

Works of Improv.	ARA	Structure Name	Installation Cost-Public Law 83-566					Installation Cost - Other funds					Total
			Construction	Engineering 2/	Real Property Rights	Project Admin	Total Public Law 566	Construction 3/	Engineering 2/4/	Real Property Rights	Project Admin	Total Other	Installation Costs
	8	G2-8-1	212,700	99,200	0	9,900	321,800	70,900	14,200	0	9,900	95,000	416,800
		G2-8-2	212,700	99,200	0	9,900	321,800	70,900	14,200	0	9,900	95,000	416,800
	9	G2-9-1	283,700	132,400	0	13,200	429,300	94,600	18,900	0	13,200	126,700	556,000
		G2-9-2	309,400	144,400	0	14,400	468,200	103,200	20,600	0	14,400	138,200	606,400
		G2-9-3	387,900	181,000	0	18,100	587,000	129,300	25,900	0	18,100	173,300	760,300
	10	BS2-30	15,800	7,400	0	700	23,900	5,300	1,100	0	700	7,100	31,000
		BS2-31	94,000	43,900	0	4,400	142,300	31,300	6,300	0	4,400	42,000	184,300
	11	G2-32	251,100	117,200	0	11,700	380,000	83,700	16,700	0	11,700	112,100	492,100
		G2-33	101,900	47,600	0	4,800	154,300	34,000	6,800	0	4,800	45,600	199,900
		CP2-34	47,900	22,400	0	2,200	72,500	16,000	3,200	0	2,200	21,400	93,900
	12	G2-70	372,300	173,800	0	17,400	563,500	124,100	24,800	0	17,400	166,300	729,800
		BS2-71	369,000	172,200	0	17,200	558,400	123,000	24,600	0	17,200	164,800	723,200
		BS2-72	34,300	16,000	0	1,600	51,900	11,400	2,300	0	1,600	15,300	67,200
	13	BS2-45	28,400	13,300	0	1,300	43,000	9,500	1,900	0	1,300	12,700	55,700
		G2-46	193,200	90,100	0	9,000	292,300	64,400	12,900	0	9,000	86,300	378,600
Total			3,630,400	1,694,200	0	169,100	5,493,700	1,239,700	241,900	0	169,100	1,650,700	7,144,400

Prepared: 06/2022

1/ Price base: 2022
2/ Includes construction observation
3/ Includes mitigation
4/ Includes permit acquisition

TABLE 2 – Tier 2 Sites (Priority 1 and 2)

Estimated Cost Distribution

Structural Measures

Bone and Long Pine Creeks Watershed, NE

(Dollars) 1/

Works of Improv.	Structure Name	Installation Cost-Public Law 83-566					Installation Cost - Other funds					Total
		Construction	Engineering 2/	Real Property Rights	Project Admin	Total Public Law 566	Construction 3/	Engineering 2/4/	Real Property Rights	Project Admin	Total Other	Installation Costs
Tier 2 Sites	Tier2-BS2-51	92,300	49,300	0	4,300	145,900	30,800	6,200	0	4,300	41,300	187,200
	Tier2-G2-33	131,300	70,100	0	6,100	207,500	43,800	8,800	0	6,100	58,700	266,200
	Tier2-G2-20	343,400	183,200	0	16,000	542,600	114,400	22,900	0	16,000	153,300	695,900
	Tier2-G2-50	343,400	183,200	0	16,000	542,600	114,400	22,900	0	16,000	153,300	695,900
	Tier2-G2-10	343,400	183,200	0	16,000	542,600	114,400	22,900	0	16,000	153,300	695,900
	Tier2-G2-1	343,400	183,200	0	16,000	542,600	114,400	22,900	0	16,000	153,300	695,900
	Tier2-G2-34	425,400	226,900	0	19,900	672,200	141,800	28,400	0	19,900	190,100	862,300
	Tier2-G2-30	412,500	220,000	0	19,300	651,800	137,500	27,500	0	19,300	184,300	836,100
	Tier2-H2-52	150,000	80,000	0	7,000	237,000	50,000	10,000	0	7,000	67,000	304,000
	Tier2-BS2-43	292,500	156,000	0	13,700	462,200	97,500	19,500	0	13,700	130,700	592,900
	Tier2-G2-80	292,500	156,000	0	13,700	462,200	97,500	19,500	0	13,700	130,700	592,900
	Tier2-G2-42	60,000	32,000	0	2,800	94,800	20,000	4,000	0	2,800	26,800	121,600
	Tier2-BS2-60	131,300	70,100	0	6,100	207,500	43,800	8,800	0	6,100	58,700	266,200
	Tier2-H2-2	112,500	60,000	0	5,300	177,800	37,500	7,500	0	5,300	50,300	228,100
	Tier2-G2-40	262,500	140,000	0	12,300	414,800	87,500	17,500	0	12,300	117,300	532,100
	Tier2-BS-32	168,800	90,100	0	7,900	266,800	56,300	11,300	0	7,900	75,500	342,300
	Tier2-SC2-31	375,000	200,000	0	17,500	592,500	125,000	25,000	0	17,500	167,500	760,000
	Tier2-G2-41	85,700	45,700	0	4,000	135,400	28,600	5,700	0	4,000	38,300	173,700
	Tier2-G2-45	128,600	68,600	0	6,000	203,200	42,900	8,600	0	6,000	57,500	260,700
	Tier2-S2-44	5200	2,700	0	200	8,100	1,700	300	0	200	2,200	10,300
	Tier2-BS2-3	15,800	8,500	0	700	25,000	5,300	1,100	0	700	7,100	32,100

Works of Improv.	Structure Name	Installation Cost-Public Law 83-566					Installation Cost - Other funds					Total
		Construction	Engineering 2/	Real Property Rights	Project Admin	Total Public Law 566	Construction 3/	Engineering 2/4/	Real Property Rights	Project Admin	Total Other	Installation Costs
	Tier2-BS-35	207,200	110,500	0	9,700	327,400	69,100	13,800	0	9,700	92,600	420,000
	Tier2-IW2-90A	6,100	3,200	0	300	9,600	2,000	0	0	300	2,300	11,900
	Tier2-IW2-90B	6,100	3,200	0	300	9,600	2,000	0	0	300	2,300	11,900
	Tier2-IW2-91A	37,500	20,000	0	1,800	59,300	12,500	0	0	1,800	14,300	73,600
	Tier2-IW2-90E	6,100	3,200	0	300	9,600	2,000	0	0	300	2,300	11,900
	Tier2-IW2-90C	6,100	3,200	0	300	9,600	2,000	0	0	300	2,300	11,900
	Tier2-IW2-90F	6,100	3,200	0	300	9,600	2,000	0	0	300	2,300	11,900
	Tier2-IW2-90D	6,100	3,200	0	300	9,600	2,000	0	0	300	2,300	11,900
	Tier2-IW2-91B	37,500	20,000	0	1,800	59,300	12,500	0	0	1,800	14,300	73,600
Total		4,834,300	2,578,500	0	225,900	7,638,700	1,611,200	315,100	0	225,900	2,152,200	9,790,900

1/ Price base: 2022

Prepared: 06/2022

2/ Includes construction observation

3/ Includes mitigation

4/ Includes permit acquisition

TABLE 4
Estimated Average Annual Costs
Bone and Long Pine Creeks Watershed, NE
(Dollars) 1/

Works of Improvement	Amortization of Installation Cost	Operation and Maintenance Cost	Total
Tier 1 Projects	318,800	26,800	345,600
Tier 2 Projects (Priority 1 and 2)	409,800	32,000	441,800
Total	728,600	58,800	787,400

Prepared: 06/2022

1/Price base: 2022, amortized over 29 years at a discount rate of 2.25%

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9.0 LIST OF PREPARERS

The document was prepared by those listed in Table 9-1 with review and guidance throughout the development of this document from those listed in Table 9-2.

Table 9-1. List of Preparers

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Table 9-2. List of Reviewers

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10.0 DISTRIBUTION LIST

The Draft Plan-EA has been submitted to the NWMC and National Headquarters (NRCS) for review and comments have been addressed. The Draft Plan-EA was distributed to the list of agencies listed below. A public notice was issued stating that the Draft EA was available for public comment and a 30-day comment period was provided. Agency comments were evaluated, and a letter was sent to each agency in response. All documentation is available in Appendix A.

- Ainsworth Irrigation District
- Brown County
- Bureau of Reclamation
- Cherry County
- City of Ainsworth
- Federal Emergency Management Agency
- National Park Service
- Nebraska Department of Environment and Energy
- Nebraska Department of Natural Resources
- Nebraska Department of Transportation
- Nebraska Game and Parks Commission
- Nebraska State Historic Preservation Office
- Office of the Governor
- Rock County
- Sandhills Task Force
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- United States Geological Survey - Nebraska Water Science Center

11.0 INDEX

Table 11-1 includes topics and associated page numbers that may be of interest to the reader.

Table 11-1. Index

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Installation Cost	3,4,18,58,59,82,87,91,97-99,101-107
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11.1 List of Acronyms

AID	Ainsworth Irrigation Unit
ARA	Affected Resource Area
APE	Area of Potential Effect
BGEPA	Bald and Golden Eagle Protection Act
BMP	Best Management Practice
BUL	Biologically Unique Landscape
CDC	Centers for Disease Control and Prevention
CEM	Channel Evolution Model
CEQ	Council on Environmental Quality
COVID-19	Coronavirus Disease 2019
CFR	Code of Federal Regulation
CFS	Cubic Feet Per Second
CPS	Conservation Practice Standard
CWA	Clean Water Act
EA	Environmental Assessment
EE	Environmental Evaluation
EIS	Environmental Impact Statement
EJ Screen	Environmental Justice Screening and Mapping Tool
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
GWMP	Groundwater Management Plan
HDPE	High-Density Polyethylene
HUC	Hydrologic Unit Code
IDNR	Iowa Department of Natural Resources
IMP	Integrated Management Plan
IP	Individual Permit
IR	Integrated Report
IRRT	Iowa River Restoration Toolbox

LiDAR	Light Detection and Ranging
MBTA	Migratory Bird Treaty Act
MNNRD	Middle Niobrara Natural Resources District
MSL	Mean Sea Level
NDEE	Nebraska Department of Environment and Energy
NDEQ	Nebraska Department of Environmental Quality
NDNR	Nebraska Department of Natural Resources
NDOT	Nebraska Department of Transportation
NEH	National Engineering Handbook
NEPA	National Environmental Policy Act
NeSCAP	Nebraska Stream Conditions Assessment Protocol
NET	Nebraska Environmental Trust
NFIP	National Flood Insurance Program
NGPC	Nebraska Game and Parks Commission
NHD	National Hydrography Dataset
NHQ	National Headquarters (NRCS)
NHPA	National Historic Preservation Act
NLAA	Not likely to Adversely Affect
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRD	Natural Resources District
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NWI	National Wetland Inventory
NWMC	National Water Management Center (NRCS)
NWSRS	National Wild and Scenic Rivers System
O&M	Operation and Maintenance
OHWM	Ordinary High-Water Mark
PDSI	Palmer Drought Severity Index
PEMC	Palustrine emergent seasonally flooded
Plan-EA	Watershed Plan-Environmental Assessment
PR&G	Principles, Requirements, and Guidelines for Water and Related Land Resources Implementation Studies
PVC	Polyvinyl Chloride
RCWP	Rural Clean Water Project
RFO	Responsible Federal Official
SAIPE	Small Area Income and Poverty Estimates
SCS	Soil Conservation Service
SDDOT	South Dakota Department of Transportation
SHPO	State Historic Preservation Office
SRA	State Recreation Area
SRT	Square Root Transform
SSM	Soil Survey Manual
SVAPV2	Stream Visual Assessment Protocol Version 2

THPO	Tribal Historic Preservation Office
TMDL	Total Maximum Daily Load
TRM	Turf Reinforcement Matting
USACE	United States Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	United States Geological Survey
WFPO	Watershed and Flood Prevention Operations
WMA	Wildlife Management Area
WPA	Wellhead Protection Areas
WRE	Wetland Reserve Easement
WQMP	Water Quality Management Plan

APPENDIX A – COMMENTS AND RESPONSES

This section will include comments and responses on the Draft Plan-EA

APPENDIX B – PROJECT MAP

APPENDIX C – SUPPORT MAPS

APPENDIX D – INVESTIGATION AND ANALYSIS

APPENDIX E – OTHER SUPPORTING DOCUMENTATION