Appendix F

Environmental Assessment of the

North Fork Elkhorn River Watershed Improvement Plan

North Fork Elkhorn River Watershed

Antelope, Cedar, Knox, and Pierce Counties, Nebraska

PREPARED BY

USDA Natural Resources Conservation Service

IN COOPERATION WITH

Lower Elkhorn Natural Resources District (LENRD)

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CHAPTER 1. PURPOSE AND NEED FOR ACTION

1.01 PURPOSE AND NEED STATEMENT

The purpose of this project is to reduce flood damages to rural communities in the North Fork Elkhorn River watershed. The PL 83-566 authorized project purpose is flood prevention (flood damage reduction).

The project is needed due to the long history of flooding damage that has occurred throughout the watershed, impacting communities as well as rural areas. Flash flooding from heavy rainfall and riverine flooding from the overtopping of the North Fork of the Elkhorn River and its tributaries, combined with topographic factors in the region, cause damages throughout the watershed. Most recently, extensive flooding events occurred in the watershed in 2019. The 2019 event caused floodwater to reach depths of up to three feet in Osmond, overtopping Highway 20 and damaging buildings and utilities. Pierce experienced extensive street flooding, including overtopping of Highway 13, as well as flood damages to buildings and utilities. Flooding impacts the local economy, makes travel difficult or impossible, threatens lives, and damages structures and property.

The Natural Resources Conservation Service (NRCS) National Watershed Program Manual defines this purpose of flood prevention (or flood damage reduction) as measures installed to prevent or reduce damages caused by floodwater. Flood damage reduction is further defined as the control and disposal of surface water caused by abnormally high direct precipitation, stream overflow, or floods aggravated or caused by wind or tidal effects.

Flood damage reduction and mitigation measures reduce or prevent floodwater damages by reducing runoff, erosion, and sediment; modifying the susceptibility of improvements in the floodplain to damage; removing damageable property from the floodplain; or reducing the frequency, depth, or velocity of flooding. Measures may also include actions that prevent encroachment into the floodplain.

The project needs have been focused into two regions based on concerns, geography, and feasibility:

- Reduce flood damages in the City of Osmond
- Reduce flood damages in the City of Pierce

1.02 PROJECT OVERVIEW

PROJECT BACKGROUND

In 2023, the Watershed and Flood Prevention Operations (WFPO) program planning process began through an agreement between the Lower Elkhorn Natural Resources District (LENRD) and NRCS. The focus of this planning process was on identifying and evaluating alternatives to

reduce the flood hazard risk in the watershed. LENRD is the Sponsoring Local Organization (SLO) for this project.

Established in 1972, Nebraska's Natural Resources Districts are local government units involved in a variety of projects and programs to conserve and protect the state's natural resources. They are locally controlled, tax funded, and watershed based. The LENRD has a responsibility to its constituency to provide guidance on comprehensive natural resources management projects with specific authority, by Nebraska state statute (Neb. Rev. State. Sec. 2-3203), which provides taxing authority, eminent domain ability, and outlines management duties specific to flood control, soil erosion, irrigation runoff, and groundwater quantity and quality.

This Watershed Plan and Environmental Assessment (Plan-EA) is prepared under the authority of WFPO (Public Law 83-566, Stat. 666 as amended) and in accordance with the National Environmental Policy Act (NEPA) (40 CFR parts 1500-1508) and following the guidelines of NRCS Title 390 – *National Watershed Program Manual* and *Principles, Requirements, and Guidance for Water and Land Related Resources Implementation Studies* (PR&G) of the Water Resources Development Act of 2007 (PL 100-114).

CHAPTER 2. ALTERNATIVES

2.01 FINAL ARRAY OF ALTERNATIVES

The alternatives described below were selected for inclusion into the Final Array of Alternatives. Further evaluation of these alternatives included site visits, field data collection and a more refined analysis of economics, environmental and social impacts, cultural and social issues, permitting requirements, and refined engineering designs.

NO ACTION

The no action alternative, or FWOFI, is the most likely future condition if none of the action alternatives are selected. In this alternative there would be no implementation of any flood damage reduction measures, and the potential for flood damages in the watershed would continue. The conditions of this alternative were utilized as the baseline to evaluate the effectiveness of the other alternatives.

ALTERNATIVE D – LEVEE IMPROVEMENTS AND DIVERSION CHANNELS

This alternative consists of constructing a northwest diversion channel (C1-10), a southwest diversion channel (C1-30), two stormwater pumping stations, and a variety of levee improvements (L1-20) including seepage berms and height increase. C1-10 runs along 854th Road and 549th Ave to reduce flows entering Pierce from the northwest. C1-30 connects the drainage area north of 853rd Road and west of 549th Ave to Willow Creek, rerouting flows coming from the west into Pierce. The two stormwater pumping stations are located on the land side of the existing Pierce levee, in sump locations north and south of Highway 98 to mitigate flood risk due to localized internal drainage. These measures are all interdependent to provide a complete alternative. Interior drainage issues would not exist had the levee not been built, and therefore the additional measures to mitigate interior flooding are interdependent with the levee improvements which will provide protection from exterior flooding sources.

As previously described in section 3.03, the existing Pierce – North Branch Elkhorn River right bank levee does not meet the current design requirements of 44 CFR 65.10 set by FEMA. Once the proposed improvements to the levee have been made, the levee system will be able to meet the requirements of USACE, FEMA, and NRCS CPS-356.

This alternative successfully reduces flooding within Pierce. This alternative satisfies the project purpose and need in addition to all objectives and constraints. **Therefore, this alternative meets all planning criteria and was carried forward into the final array of alternatives.**

Note that improvements made to the levee upstream of the confluence of the North Fork Elkhorn River and Yankton Slough are eligible for PL 83-566 funding. Improvements made downstream

of the confluence are not eligible for PL 83-566 funding. This division of funding is included in the estimated costs used throughout this plan.

ALTERNATIVE F – ROAD RAISE, BERM, AND NONSTRUCTURAL

This alternative consists of constructing a road raise (F1-1) and berm (F1-2) which work interdependently to prevent floodwater from entering Osmond and making nonstructural improvements to up to a dozen homes to reduce flooding damage. This alternative successfully reduces flooding within Osmond. This alternative satisfies the project purpose and need in addition to all objectives and constraints. **Therefore, this alternative meets all planning criteria and was carried forward into the final array of alternatives.**

2.02 PROPOSED ACTION

The proposed action is to install both Alternatives D and F. Of the alternatives considered, Alternatives D and F meet the project purpose and need, provide the most ecosystem service benefits, best meets the Federal Objective, are the locally preferred alternative, and provide a positive monetary benefit to cost ratio.

POSSIBLE CONFLICTS WITH PLANS AND POLICIES

A review of available regional water management plans, coordination with the Sponsor, and Cities of Osmond and Pierce shows that there are no anticipated conflicts with currently available plans or policies.

PRECEDENT FOR FUTURE ACTIONS WITH SIGNIFICANT IMPACTS

The actions required to implement the preferred alternative do not set a precedent for future actions in the watershed that would cause significant impacts. Any other projects similar in nature and vision would be evaluated under their own standalone study.

MEASURES TO BE INSTALLED

In Pierce, levee improvements consisting of seepage berms and a height increase would be constructed in conjunction with interior drainage improvements consisting of two diversion channels, and two stormwater pumping stations. All these elements are interdependent to provide a complete alternative. Interior drainage issues would not exist had the levee not been built, and therefore the additional measures to mitigate interior flooding are interdependent with the levee improvements which will provide protection from exterior flooding sources.

In Osmond, a road raise and berm would be constructed, and nonstructural improvements would be made to homes south of Highway 20. The road raise and berm elements are interdependent. The 4th Street road raise prevents floodwater from entering the central portion of Osmond but also results in increases to floodwater depth to the northeast. The berm element of the alternative was therefore included to provide protection to the northeastern portion of Osmond. Nonstructural

improvements would be made to up to a dozen homes identified south of Highway 20 that are prone to frequent flooding damage.

Each of these alternatives would successfully provide flood damage reduction to their respective communities. Summaries of the design details are provided in Structural Tables at the end of Chapter 7 of the Watershed Plan. Additional details, including NRCS Engineering Job Classifications, are provided in Appendix D, with maps and drawings provided in Appendix C. A preliminary level geologic investigation and seismic analysis was performed in support of the planning phase of the preferred alternative, and a summary of this work is provided in Appendix D. During final design, additional geologic investigation will be performed.

Note that technical and financial assistance for the implementation of the preferred alternative is limited and would be provided only when it contributes to achieving the project's objectives. Participation in the WFPO program is voluntary and the Sponsor would make the final decision on what measures would be implemented.

Each of the works of improvement would abide by the design requirements of at least one NRCS Conservation Practice Standard (CPS), as detailed below. For the purposes of planning and environmental review the following Nebraska CPS codes were identified as applicable to each measure; however, final determination would be made during the design phase.

- CPS 342: Critical area planting
- CPS 356: Dike and levee (Class 1)
- CPS 410: Grade stabilization structure
- CPS 472: Access Control
- CPS 500: Obstruction Removal
- CPS 533: Pumping Plant
- CPS 560: Access road
- CPS 572: Spoil disposal
- CPS 580: Streambank and shoreline protection
- CPS 582: Open channel
- CPS 620: Underground Outlet

PIERCE LEVEE IMPROVEMENTS L1-20

The existing Pierce levee is situated between the city and the North Fork Elkhorn River. The improvements would support the original purpose of the levee of reducing the risk of riverine flooding stemming from the North Fork Elkhorn River. Levee improvements were based on the 100-year water surface elevation plus 3.5 feet of freeboard. The improvements consist of adding earth fill to the landward side of the existing levee and raising the top of levee elevation by approximately 2 feet. Seepage berms and toe trench drains would also be implemented. The seepage berms would consist of 4-foot tall, 150-foot wide fill where space permits. Two trench drains would be used where space is not available for seepage berm construction. Levee design would follow FEMA and USACE standards as well as NRCS CPS codes.

Note that improvements made to the levee upstream of the confluence of the North Fork Elkhorn River and Yankton Slough are eligible for PL 83-566 funding. Improvements made downstream of the confluence are not eligible for PL 83-566 funding. This division of funding is included in the estimated costs used throughout this plan.

PIERCE SOUTHWEST DRAINAGE IMPROVEMENTS C1-30

C1-30 works interdependently with C1-10 and the stormwater pumping stations to help mitigate flooding caused by internal sources on the landward side of the Pierce levee. C1-30 consists of a diversion channel running between 853 Rd and 549 Ave. The channel would run for approximately 2,400 ft and have a bottom width of 14 ft. This channel would capture flows entering Pierce from the west and reroute them south around the city to Willow Creek. Additional improvements would include road crossing improvements, a pedestrian bridge to reduce backwater effects at an existing hike/bike trail, and stream stabilization improvements at the downstream end of the channel.

PIERCE NORTHWEST DRAINAGE IMPROVEMENTS C1-10

C1-10 works interdependently with C1-30 and the stormwater pumping stations to help mitigate flooding caused by internal sources on the landward side of the Pierce levee. C1-10 consists of a diversion channel running between 548 Ave and State Highway 13. The channel would run for approximately 1.5 miles parallel to 854 Rd and 549 Ave with a bottom width of 10-12 ft. This channel would capture flows entering Pierce from the northwest and funnel them to the north. Floodwater would exit the channel on the east side of State Highway 13 and be prevented from re-entering Pierce by the improved levee.

PIERCE STORMWATER PUMPING STATIONS

The stormwater pumping stations work interdependently with C1-30 and C1-10 to help mitigate flooding caused by internal sources on the landward side of the Pierce levee. Two locations for pumping stations were identified, consisting of low spots (sumps) along the landward side of the existing levee. The pumping stations would pull floodwater building up within Pierce and reroute it to the river side of the levee, thereby reducing flood risks within the city.

OSMOND 4TH STREET FLOOD REDUCTION F1-1

F1-1 consists of a road raise running for approximately 1,100 ft along 4th Street in Osmond, east of N Hill St. The road elevation will be raised an average of 3 ft, with a maximum raise of 6.25 ft. Additionally, this includes grading of a portion of the surrounding baseball field area to restore high ground and prevent floodwater from backing up into Osmond. To minimize grading impacts to existing infrastructure, a retaining wall running north-south with a maximum height of 6 feet was utilized on the eastern perimeter of the grading area. Baseball field concessions and restroom buildings will also be raised to the new proposed grade, above flood elevations. F1-1 and F1-2 work interdependently to provide flood reduction to Osmond. F1-1 prevents floodwater from

entering the center of the city but causes an increase in flooding depth to the northeastern portion of Osmond. F1-2 provides flood protection to the northeastern portion of the city.

OSMOND NORTHEAST FLOOD REDUCTION F1-2

F1-2 consists of an earthen berm running for approximately 650 ft with a top width of 10 ft and maximum height of 7.6 ft. The berm is located east of the homes built along N Park St, running north-south. This berm ties into existing higher ground at each end. F1-1 and F1-2 work interdependently to provide flood reduction to Osmond. F1-1 prevents floodwater from entering the center of the city but causes an increase in flooding depth to the northeastern portion of Osmond. F1-2 provides flood protection to the northeastern portion of the city.

OSMOND NONSTRUCTURAL

Twelve homes located south of Highway 20 in Osmond were identified for potential implementation of nonstructural floodproofing improvements. While the final nonstructural measures for each structure will ultimately be decided by the homeowner and Sponsor during the design phase, it was assumed that each of these structures would be elevated above the base flood elevation for cost estimating purposes.

BORROW AND SPOIL MATERIAL

Potential borrow sites have been identified, and fieldwork for those sites will be completed during the design phase. If the fieldwork reveals unfavorable conditions, additional borrow sites will need to be investigated at greater cost to the Sponsor. This will include wetland delineations, cultural resources investigations, and geological / geotechnical investigations. A map of the potential sites is included in Appendix C. Spoil materials will be located within the ARA.

CHAPTER 3. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.01 INTRODUCTION

This chapter contains a synopsis of the relevant resource concerns identified through project scoping and the impacts of the proposed project alternatives.

Information is provided at both the watershed perspective and within the affected resource areas (ARA) or area of potential effect (APE). Both the ARA and APE are the geographic area within which an undertaking may directly or indirectly impact the environment, and which form the basis for each alternative to be evaluated for potential impacts. The APE is utilized for evaluating potential effects on cultural and historic properties (including visual effects), while the ARA is utilized for all other environmental resources. Maps of the ARA and APE can be found in Appendix C. Care was taken to properly define the ARA to ensure any possible lateral effects to wetlands due to drainage could be evaluated. These distances were established based on soils, alternative designs, and procedures from the NRCS National Engineering Handbook (NEH Part 650, Chapter 14, Appendix G).

3.02 SOIL RESOURCES

LAND USE

All land use types produce runoff; however, some are greater contributors than others. Farmland has higher runoff rates due to the limited perennial vegetation. Developed and urban regions can produce a disproportionate amount of runoff compared to their size due to the lack of natural vegetation and large areas of impervious materials. Natural areas of grassland and forest have lower rates of runoff due to increased infiltration rates. Land use within the watershed is dominated by agriculture, with 82% (approximately 185,005 acres) of the area used for cropland and 11% (approximately 25,075 acres) of the area used for pasture in 2023 (USDA, 2023). The rest of the watershed consists of smaller amounts of forest, urban, and water/wetlands. Within the ARA, cropland and pasture usage are as follows:

- Pierce ARA
  - Cropland: 35% (215 ac)
  - Pasture: 30% (180 ac)
- Osmond ARA
  - Cropland: 30% (9 ac)
  - Pasture: 26% (8 ac)

No Action Alternative: Impacts would be indirect, permanent, and neutral. Existing land uses in the watershed would not change. The primary land uses in the watershed would continue to be

agricultural. Flood waters would continue to cause scouring and sedimentation in agricultural fields.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, negligible, permanent, and neutral. Construction of the alternative would remove approximately 16 acres of cultivated cropland from production, this amounts to a negligible change on the watershed scale. This change to land use could have an extremely minor impact on the local agricultural economy by reducing overall yield and could have a positive impact on local groundwater quality by reducing the agricultural pollutant loading. Outside of the area directly affected due to construction, the agricultural nature of the watershed would remain unchanged.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, negligible, permanent, and neutral. Construction of the alternative would remove approximately 0.5 acres of cultivated cropland from production, this amounts to a negligible change on the watershed scale. This change to land use could have an extremely minor impact on the local agricultural economy by reducing overall yield and could have a positive impact on local groundwater quality by reducing the agricultural pollutant loading. Outside of the area directly affected due to construction, the agricultural nature of the watershed would remain unchanged.

PRIME AND UNIQUE FARMLAND

The Farmland Protection Policy Act (FPPA) was passed by Congress as part of the Agriculture and Food Act of 1981. The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. For the purposes of FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance (NRCS, 2012):

- **Prime farmland** is land that has the best combination of physical and chemical characteristics for producing agricultural crops and livestock with minimum uses of fuel, chemicals, labor, and tolerable rates of soil erosion.
- **Unique farmland** is non-prime farmland that is used for production of specific high-value crops such as citrus, tree nuts, olives, etc.
- **Farmland that is of statewide or local importance** is used to produce food, feed, fiber, forage, or oilseed crops, as determined by the appropriate State or unit of local government agency, with the approval of the Secretary of Agriculture (NRCS, 2012).

Note that not all areas that have been classified as prime or unique farmland are necessarily actively in use as cropland at any given time. Within the watershed, there are approximately 117,456 acres of prime farmland, 16,541 acres of farmland of statewide importance, and 16,110 acres which would be prime farmland if drained (NRCS, 2023). Prime farmland within the ARA is as follows:

- Pierce ARA
    - Prime Farmland: 42 ac

    - Farmland of Statewide Importance: 128 ac
    - Prime Farmland if Drained: 157 ac
- Osmond ARA
    - Prime Farmland: 29 ac

No Action Alternative: This impact would be indirect, minor, permanent, and adverse. Flooding would continue to threaten prime and unique farmland in the watershed. While not all designated prime and unique farmland is actively used for crop production, the potential for future usage of prime farmland could be reduced due to flooding damages such as scour and debris buildup.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, negligible, permanent, and adverse. In accordance with NEPA and FPPA requirements, anticipated impacts to prime and unique farmland were reviewed by the Nebraska NRCS Assistant State Soil Scientist. Per this consultation, construction of this alternative would result in 20 acres of prime and unique farmland being permanently converted. The FPPA consultation found that no protection or additional evaluation would be necessary for this project. The FPPA consultation letter is included in Appendix A.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, negligible, permanent, and adverse. In accordance with NEPA and FPPA requirements, anticipated impacts to prime and unique farmland were reviewed by the Nebraska NRCS Assistant State Soil Scientist. Per this consultation, construction of this alternative is exempt. Therefore, no protection or additional evaluation would be necessary for this project. The FPPA consultation letter is included in Appendix A.

GEOLOGY

Bedrock within the study area is mapped as the Ogallala Group, which was deposited during the Miocene epoch in Nebraska. The Ogallala Group is composed of deposits originating from eroded Rocky Mountains sediment, and as such, the materials can be complex and varied. However, most sediments of the Ogallala Group generally include sands, gravels, sandstones, siltstones, claystones, and conglomerates (Burchett et al., 1988). Additionally, within the region, the Ogallala Group hosts the important High Plains Aquifer hydrogeologic unit, which is sometimes locally referred to as the Ogallala Aquifer. The landscape of northeastern Nebraska today is essentially the product of glacial ice, flowing water, and wind active during the Pleistocene and Holocene epochs of the Quaternary Period (Joeckel, 2017). During the Pleistocene epoch (about two million to 10,000 years ago), continental glaciers traversed the northern Great Plains multiple times. Glacial ice repeatedly blocked and diverted rivers, formed lakes, and filled valleys with sediment. Rivers carried meltwater from glaciers that contained heavy amounts of sand and silt, which was then deposited along floodplains. These glaciers extended across eastern Nebraska, where they left behind deposits of till primarily consisting of clay, silt, sand, and gravel (Wayne, 2011). Wind eroded these deposits, creating dune fields and leaving a layer of loess on the uplands. These

deposits have since been further modified by climatic, and more recently anthropogenic, conditions.

A preliminary geological and geotechnical exploration was completed within the ARA. This exploration included 14 soil borings (12 in Pierce and 2 in Osmond). All borings were conducted within the geologic floodplain of the North Fork Elkhorn River. Alluvial soils within the floodplain generally consist of silts and clays near the surface, with deeper deposits consisting of fine to coarse sand with interbedded clay layers. The existing soils encountered across the boring sites consist primarily of alluvial deposits ranging in moisture contents, consistency, and plasticity. Primary bedrock within the region is the Ogallala Group, which is largely deeply underlain by Cretaceous or Permian/Pennsylvanian limestones and shales. Groundwater was encountered in all borings at depths ranging from 4 to 19 feet below ground. The soil conditions appear generally suitable for support of the proposed projects (Thiele, 2024). Additional information is included in Appendix D, as well as the full Preliminary Geotechnical Investigation report within Appendix E.

No Action Alternative: Impacts would be indirect, permanent, and neutral. Flooding would neither disturb nor enhance geological units.

Levee Improvements and Diversion Channels Alternative: Impacts would be indirect, permanent, and neutral. This alternative would neither disturb nor enhance geological units. Geologic conditions that may impact the design of this alternative would be thoroughly explored during the design phase. Per the USGS Quaternary Faults map, there are no active faults near the project sites.

Road Raise, Berm, and Nonstructural Alternative: Impacts would be indirect, permanent, and neutral. This alternative would neither disturb nor enhance geological units. Geological / geotechnical conditions that may impact the design of this alternative would be thoroughly explored during the design phase. Per the USGS Quaternary Faults map, there are no active faults near the project sites.

3.03 WATER RESOURCES

WATERS OF THE UNITED STATES

The United States Clean Water Act (CWA) of 1972 establishes the basic structure for regulating discharge of pollutants into the waters of the United States and regulates the quality standards for surface waters. The discharge of dredged or fill material into waters of the United States, including wetlands, is regulated through Section 404 of the CWA. In Nebraska, any discharge of dredged or fill material requires authorization from the Secretary of the Army, acting through the United States Army Corps of Engineers (USACE). Section 402 of the CWA regulates sewer discharges and stormwater discharges from developments, construction sites, or other areas of soil disturbance. In Nebraska, the NDEE is responsible for administering Section 402 through the

National Pollutant Discharge Elimination System (NPDES). The USACE is a cooperating agency for this NEPA document and will use the analysis to assist in project review for meeting requirements for Section 404 of the Clean Water Act.

No Action Alternative: Impacts would be indirect, permanent, and neutral. There would be no placement of fill within any streams or waterbodies due to this alternative. This alternative would not require any review under the Clean Water Act.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, minor, permanent, and adverse. All applicable provisions of the Clean Water Act would be complied with during the permitting and construction of this alternative. The project would be reviewed by USACE under CWA Section 404. It is anticipated that this project would be permitted under an Individual Permit. Final impacts and mitigation requirements would be verified during the design and permitting phases.

Steps were taken to avoid and minimize impacts on aquatic resources to the greatest extent possible. These are permanent impacts involving fill placement, excavation, or lateral drainage and would require mitigation. Further detail is provided in the Surface Water Quantity and Wetlands sections below, and in Appendix E.

Table 1: Summary of Impacts on Aquatic Resources in Pierce

Aquatic Resource Impacted	Classification	Total Impact (ac)
Stream	Ephemeral	0.074
Stream	Intermittent	0.002
Stream	Perennial	0.000
Canal	Canal	0.018
Wetland	PEMA/C	5.615
Wetland	PFOA/C	0.000
Wetland	PUBA/C	0.000

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, minor, permanent, and adverse. All applicable provisions of the Clean Water Act would be complied with during the permitting and construction of this alternative. The project would be reviewed by USACE under CWA Section 404. It is anticipated that this project would be permitted under a Nationwide Permit. Final impacts and mitigation requirements would be verified during the design and permitting phases.

Steps were taken to avoid and minimize impacts on aquatic resources to the greatest extent possible. It is not anticipated that any mitigation actions would be required. Further detail is provided in the Surface Water Quantity and Wetlands sections below, and in Appendix E.

Table 2: Summary of Impacts on Aquatic Resources in Osmond

Aquatic Resource Impacted	Classification	Total Impact (ac)
Stream	Ephemeral	0.011
Stream	Intermittent	0.000

Stream	Perennial	0.000
Canal	Canal	0.000
Wetland	PEMA/C	0.000
Wetland	PFOA/C	0.000
Wetland	PUBA/C	0.000

STREAMS AND WATER QUANTITY

According to the United States Geological Survey (USGS) National Hydrography Dataset (NHD) there are approximately 693 cumulative miles of streams in the watershed. USGS data classifies 92 miles of streams as perennial, which includes the North Fork Elkhorn River, West Branch North Fork Elkhorn River, Dry Creek, and Breslau Creek. The remaining streams in the watershed are classified as intermittent (USGS, 2023). There are no significant lakes or reservoirs within the watershed. NHD streams within the ARA are as follows:

- Pierce ARA
  - Intermittent Streams: 0.7 mi
  - Perennial Streams: 0.8 mi
- Osmond ARA
  - N/A

As the Elkhorn River is a tributary to the Platte River, altering the hydrology in the watershed could impact the hydrology of the Platte River. Due to the cumulative effects of many water depletion projects in the Platte River basin, the Nebraska Game and Parks Commission (NGPC) considers any depletion of flows, direct or indirect, from the Platte River system to be significant. However, the USFWS and NRCS agree that actions which result in annual cumulative depletions of flows to the Platte River that are 25 acre-feet or less in Nebraska have “no adverse effect” on flows in the Platte River and to associated federally or state listed species and designated critical habitat.

No Action Alternative: Impacts would be indirect, permanent, and neutral. This alternative would not directly alter any stream channels or impound any surface water. The hydrology of the watershed would be maintained as it currently exists, and tributaries would continue to flow to the Elkhorn River. There would be no depletion of Platte River flows.

Levee Improvements and Diversion Channels Alternative: Impacts would be direct, permanent, and neutral. This alternative would not impound any water and would only function during flooding events. Under normal flow conditions the hydrology of the watershed would be maintained, and tributaries would continue to flow to the Elkhorn River and eventually the Platte River as normal. This alternative would cause no depletion to existing flows in the Platte River system as no water would be detained. There would be no alteration of surface water quantity.

A jurisdictional determination alongside the Nebraska Stream Condition Assessment Procedure (NeSCAP) would be completed during the design phase. Mitigation requirements are determined by USACE based on the comparison of stream conditions before and after implementation of the project. Existing and proposed stream conditions would be analyzed using NeSCAP to determine

if the overall function of the stream system would be improved following project implementation. If the function of the stream is uplifted, no additional mitigation actions would be required. If mitigation actions are required, they would be completed by improving existing stream channels within the ARA.

Road Raise, Berm, and Nonstructural Alternative: Impacts would be direct, permanent, and neutral. This alternative would not impound any water and would only function during flooding events. Under normal flow conditions the hydrology of the watershed would be maintained, and tributaries would continue to flow to the Elkhorn River and eventually the Platte River as normal. This alternative would cause no depletion to existing flows in the Platte River system as no water would be detained. There would be no alteration of surface water quantity.

The project would be reviewed by USACE under CWA Section 404. It is anticipated that this alternative would be permitted under a Nationwide Permit. The majority of impacts were avoided by limiting grading extents to avoid known stream channels. All impacts are necessary to build these sites to meet current NRCS design standards. No mitigation would be required for this alternative.

WETLANDS

A wetland delineation, conducted in accordance with USACE's 1987 Wetland Delineation Manual and regional supplement to the manual was conducted within the ARA. This included a desktop review conducted using a variety of data sources, as well as in-field work conducted in July 2024. Additional details are included in the wetland delineation reports in Appendix E. The results of the wetland delineations are summarized in Table 3.

Table 3: Summary of Wetland Delineation Results

Type (Cowardin | Nebraska Subclass)	Total Delineated Area (ac)
Pierce ARA	
PEMA/C | Floodplain Depression	16.389
PEMA/C | Lacustrine Fringe	1.446
PEMA/C | N/A	0.113
PEMA/C | Riverine Channel	17.266
PFOA/C | Riverine Channel	1.862
PUBA/C | Riverine Channel	0.128
Osmond ARA	
PEMA/C | Floodplain Depression	0.043

Detailed information and maps of wetland impacts can be found in Appendix E. Wetland delineation reports are available upon request.

No Action Alternative: This impact would be indirect, minor, permanent, and adverse. There would be no direct placement of fill within wetlands due to this alternative. Wetlands would

continue to be threatened by future flooding damage. While inundated during a flood, wetlands can become clogged by debris or scoured due to the erosive forces of floodwaters.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, minor, permanent, and adverse. Construction of this alternative would result in 5.615 acres of wetlands being permanently impacted due to fill placement, excavation, or lateral drainage.

The project would be reviewed by USACE under CWA Section 404. It is anticipated that this alternative would be permitted under an Individual Permit. The majority of impacts were avoided and/or minimized by limiting grading extents and altering alignments to avoid known wetlands. All impacts are necessary to build these sites to meet current NRCS design standards. This project complies with the Food Security Act by not making the wetland areas easier to farm than they currently are or converting any wetlands to farmland. This project complies with Executive Order 11990 by adequately replacing impacted wetlands with new wetlands. Mitigation actions would be required for these wetland impacts. Additional information, including breakdowns by wetland subclass, is included in Appendix E.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, minor, permanent, and adverse. Construction of this alternative would not impact any wetlands. The project would be reviewed by USACE under CWA Section 404. It is anticipated that this alternative would be permitted under a Nationwide Permit. All impacts were avoided. This project complies with the Food Security Act by not making the wetland areas easier to farm than they currently are or converting any wetlands to farmland. This project complies with Executive Order 11990 by adequately replacing impacted wetlands with new wetlands. No mitigation would be required. Additional information, including breakdowns by wetland subclass, is included in Appendix E.

SURFACE WATER QUALITY

The United States Clean Water Act (CWA) of 1972 establishes the basic structure for regulating discharge of pollutants into the waters of the United States and regulates the quality standards for surface waters. These standards are the basis of water quality enforcement in Nebraska. Due to the nature of the project and the requirements set out by the CWA, alternatives will likely require this project to obtain a 404 permit.

The Nebraska Department of Environment and Energy (NDEE) is responsible for implementing the CWA Section 319 Program for the State of Nebraska. This program focuses on the control of nonpoint sources of water pollution for waterbodies, based on meeting water quality standards laid out in Sections 401 and 404 of the CWA, and Nebraska Administrative Code Title 117, which provides numerical water quality standards for all surface waters within Nebraska. NDEE assigns one or more beneficial uses to all designated surface waters within or bordering the State. These beneficial uses are based on the location and characteristics of each stream or lake. Water quality criteria are assigned to each waterbody based on their beneficial use and vary by pollutant. When a waterbody fails to meet its assigned beneficial use, it can be considered impaired and placed on the 303(d) List of Impaired Waters. The watershed contains two impaired waterbodies: the

lower segment of Dry Creek, and a segment of the North Fork Elkhorn River. Both of which are impaired due to elevated levels of *E. coli* bacteria. The ARAs do not contain any impaired streams or waterbodies.

No Action Alternative: This impact would be indirect, minor, permanent, and adverse. This alternative would not cause any changes to the current conditions of surface water quality in the watershed. Surface water quality would continue to be harmed due to flooding. Pollutants carried by floodwaters would continue to move through the watershed, degrading surface water quality.

Levee Improvements and Diversion Channels Alternative: Impacts would be indirect, long-term, and neutral. This alternative is unlikely to impact surface water quality. The alternative would not impound any water. Under normal flow conditions, pollutants in runoff would continue to be transported through the watershed and accumulate in the same locations they do under current conditions.

Road Raise, Berm, and Nonstructural Alternative: Impacts would be indirect, long-term, and neutral. This alternative is unlikely to impact surface water quality. The alternative would not impound any water. Under normal flow conditions, pollutants in runoff would continue to be transported through the watershed and accumulate in the same locations they do under current conditions.

GROUNDWATER QUANTITY

There is no shortage of groundwater in the region and much of the watershed has experienced increases in the water table. Between predevelopment and the spring of 2023, the water table has experienced little change throughout the watershed. The greatest changes are found near Wausa, where the water table has lowered between 5 and 20 feet; and near Pierce the water table has increased between 5 and 10 feet (UNL-CSD, 2024). Predevelopment is generally identified as the early 1950s, prior to the widespread use of irrigation wells in Nebraska. Note that these measurements are broad and meant to be interpreted on a regional scale, therefore no site-specific information is available at the ARA level.

No Action Alternative: Impacts would be indirect, permanent, and neutral. This alternative would not cause any changes to existing groundwater quantity in the watershed. The no action alternative would not create any additional opportunities for groundwater recharge, nor would it cause any depletions of groundwater.

Levee Improvements and Diversion Channels Alternative: Impacts would be indirect, permanent, and neutral. This alternative would not cause any groundwater depletion and is not associated with any pumping of groundwater. As the alternative would not impound any water, there is little to no potential for groundwater recharge to occur.

Road Raise, Berm, and Nonstructural Alternative: Impacts would be indirect, permanent, and neutral. This alternative would not cause any groundwater depletion and is not associated

with any pumping of groundwater. As the alternative would not impound any water, there is little to no potential for groundwater recharge to occur.

GROUNDWATER QUALITY

Groundwater is the sole source of drinking water for approximately 88% of Nebraska residents (NDEE, 2023). In the North Fork Elkhorn River Watershed, 100% of public and private drinking water supply is sourced from groundwater. In Nebraska, the primary pollutant of concern that impacts groundwater quality is nitrate-nitrogen (nitrate). Nitrate leaching into groundwater is common in agricultural areas where it is widely found in fertilizers and is sampled for frequently.

The Nebraska Quality-Assessed Agrichemical Contaminant database (NQAAC) is maintained by NDEE and contains groundwater sample results collected by multiple state and local agencies from thousands of wells throughout the state. Based on information available through NQAAC, wells in Pierce County have a median nitrate concentration of 10.7 mg/L (NDEE, 2024). The United States Environmental Protection Agency's maximum contaminant level is 10 mg/L of nitrate allowable in drinking water. No site-specific information is available at the ARA level.

No Action Alternative: This no effect impact would be indirect, permanent, and neutral. This alternative would have no effect on groundwater quality. Groundwater quality in this region is primarily driven by land use and management decisions such as application of fertilizer to agricultural lands. Leaching and travel of pollutants into and within an aquifer occurs over many years. The no action alternative would not directly lead to any changes in land use or management and therefore would have no impact on existing groundwater quality.

Levee Improvements and Diversion Channels Alternative: This impact would be indirect, negligible, long-term, and beneficial. Groundwater quality in this region is primarily driven by land use and management decisions such as application of fertilizer to agricultural lands. This alternative has the potential to improve groundwater quality by reducing pollutant loading. Construction of this alternative would remove approximately 16 acres of cultivated cropland from production. Nitrate loss to groundwater from an irrigated cornfield in this region is estimated to be approximately 8.2 lbs/acre/year (Potter et al., 2006). Therefore, the overall nitrate load to groundwater in the watershed would be reduced by approximately 131.2 lbs./year under this alternative.

Road Raise, Berm, and Nonstructural Alternative: This impact would be indirect, negligible, long-term, and beneficial. Groundwater quality in this region is primarily driven by land use and management decisions such as application of fertilizer to agricultural lands. This alternative has the potential to improve groundwater quality by reducing pollutant loading. Construction of this alternative would remove approximately 0.5 acres of cultivated cropland from production. Nitrate loss to groundwater from an irrigated cornfield in this region is estimated to be approximately 8.2 lbs/acre/year (Potter et al., 2006). Therefore, the overall nitrate load to groundwater in the watershed would be reduced by approximately 4.1 lbs./year under this alternative.

REGIONAL WATER MANAGEMENT PLANS

The watershed is located within the study area of the following management plans:

- Lower Elkhorn River Basin Water Quality Management Plan (LENRD, 2019)
  - Identifies the most effective and efficient methods of addressing nonpoint source pollution in the Lower Elkhorn River Basin.
- Lower Platte River Basin Coalition Basin Water Management Plan (LPRBC, 2017)
  - Cooperative planning effort between multiple agencies to characterize and sustain the long-term balance between water uses and supplies throughout the Lower Platte River Basin.
- LENRD Voluntary Integrated Management Plan (LENRD, 2018a)
  - Identifies goals and objectives with a purpose of sustaining the balance between water supply and uses in the Lower Platte River Basin.
- LENRD Groundwater Management Plan (LENRD, 2018b)
  - Characterizes groundwater resources and demands within the LENRD and identifies goals and objectives related to groundwater management.
- LENRD Drought Management Plan (LENRD, 2017)
  - Identifies processes in order to respond to and manage the impacts of drought events in the LENRD.

None of the identified regional water management plans above contains goals related to flood prevention and/or flood damage reduction.

No Action Alternative: Impacts would be direct, permanent, and neutral. This alternative is not part of any existing regional water management plans nor any requirement of a regional water management plan. None of the regional water management plans identified above contains goals directly related to flood prevention and/or flood damage reduction. This alternative would be compliant with the Lower Platte River Basin Coalition Basin Water Management Plan (LPRBC, 2017) as it would not result in any depletion of flows to the Platte River.

Levee Improvements and Diversion Channels Alternative: Impacts would be direct, permanent, and neutral. This alternative is not part of any existing regional water management plans nor any requirement of a regional water management plan. None of the regional water management plans identified above contains goals directly related to flood prevention and/or flood damage reduction. This alternative would be compliant with the Lower Platte River Basin Coalition Basin Water Management Plan (LPRBC, 2017) as it would not result in any depletion of flows to the Platte River.

Road Raise, Berm, and Nonstructural Alternative: Impacts would be direct, permanent, and neutral. This alternative is not part of any existing regional water management plans nor any requirement of a regional water management plan. None of the regional water management plans identified above contains goals directly related to flood prevention and/or flood damage reduction. This alternative would be compliant with the Lower Platte River Basin Coalition Basin Water

Management Plan (LPRBC, 2017) as it would not result in any depletion of flows to the Platte River.

FLOODPLAIN MANAGEMENT

The regulatory floodplain is a geographic area delineated by the Federal Emergency Management Agency (FEMA) to determine levels of flood risk and administer the National Flood Insurance Program (NFIP). The extents of the 100-year floodplain have not been made available digitally by FEMA through the National Flood Hazard Layer (NFHL) for the entirety of the watershed at the time of this writing.

Four towns in the watershed (Osmond, Pierce, Plainview, and Wausa) participate in the NFIP. Osmond has zoning in place to prevent any additional homes from being built in the flood-prone area located south of the BNSF railroad tracks. Pierce also has floodplain regulations in their zoning. Three watershed counties (Antelope, Knox, and Pierce Counties) participate in the NFIP. Three counties (Antelope, Cedar, and Knox Counties) have floodplain zoning regulations.

Because of the inconsistent data quality, more specific floodplain zones, such as floodway, were unable to be determined and mapped. Based on the available data, approximately 22,427 acres of the watershed, or 10% of the total area, falls within the 100-year floodplain. Approximately 189 acres of this floodplain fall within the Cities of Osmond and Pierce, putting them at greater risk of flooding. The Pierce ARA contains 116 acres of floodplain, and the Osmond ARA contains 14 acres of floodplain, all of which is classified as Zone A floodplain by FEMA.

No Action Alternative: Impacts would be indirect, permanent, and neutral. This alternative would have no effect on the current regulatory flood hazard areas or on the management of floodplain regions within the watershed. There would be no change to any mapped regulatory floodplains and residents living in the floodplain would continue to be required to purchase flood insurance.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, major, long-term, and beneficial. This alternative would provide significant reductions to the extent and depth of all flooding recurrence intervals up to and including the 100-year event in the North Fork Elkhorn River Watershed within the City of Pierce. Note that flood risk remains during events greater (less frequent) than the 100-year recurrence interval. Figures showing modeled existing and proposed flooding conditions are included in Appendix C.

Project benefits are significant based on flood modeling developed for the purposes of this plan to assess existing and proposed flood risk conditions. Additional information about flood modeling is available in Appendix D. It is anticipated implementation of this alternative will result in a future revision to the regulatory floodplain based on the additional flood risk analysis detail for the watershed developed for this plan. To assure a successful map change and to support floodplain permitting for the project, based on the conceptual alternative presented in this plan it is anticipated a Conditional Letter of Map Revision (CLOMR) would be submitted prior to project

construction, if the project is funded and implemented. Once the project is completed, a Letter of Map Revision (LOMR) would be requested from FEMA to ensure updated regulatory floodplain maps are developed.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, major, long-term, and beneficial. This alternative would provide significant reductions to the extent and depth of all flooding recurrence intervals up to and including the 100-year event in the North Fork Elkhorn River Watershed within the City of Osmond. Note that flood risk remains during events greater (less frequent) than the 100-year recurrence interval. Figures showing modeled existing and proposed flooding conditions are included in Appendix C.

Project benefits are significant based on flood modeling developed for the purposes of this plan to assess existing and proposed flood risk conditions. Additional information about flood modeling is available in Appendix D. It is anticipated implementation of this alternative will result in a future revision to the regulatory floodplain based on the additional flood risk analysis detail for the watershed developed for this plan. To assure a successful map change and to support floodplain permitting for the project, based on the conceptual alternative presented in this plan it is anticipated a Conditional Letter of Map Revision (CLOMR) would be submitted prior to project construction, if the project is funded and implemented. Once the project is completed, a Letter of Map Revision (LOMR) would be requested from FEMA to ensure updated regulatory floodplain maps are developed.

FEDERALLY AUTHORIZED LEVEE SYSTEM

Per the National Levee Database (USACE, 2024), the watershed contains two segments of Federally Authorized Levees, both located in Pierce. These consist of the North Branch Elkhorn right bank (RB) levee and left bank (LB) levee. These levees were originally built to protect Pierce to the 100-year storm standard. The levees were completed in 1964 and provided flood risk reduction benefits for approximately 735 buildings at the time. This levee system falls under the USACE Section 408 program, which means it cannot be altered without permission granted by the Secretary of the Army and any alterations must follow USACE regulations and requirements. Recent inspections of the levees have identified issues which, if left unaddressed, could increase the chance of a levee breach (USACE, 2024).

The Pierce-North Branch Elkhorn RB system is listed as a FEMA Accredited Levee System with a FIRM effective date of September 1985. To remain accredited during the next FEMA remapping process, the levee must meet the design requirements of 44 CFR 65.10 set by FEMA. Upon review of available data, it is apparent the existing levee does not meet the design requirements for minimum freeboard and therefore requires improvements to restore the system to its originally authorized purpose. This levee system would fall under a Class I levee system per NRCS 356-CPS, March 2022.

Additionally, while construction of this levee helped to protect Pierce from riverine flooding, it did not address the residual risk of interior flooding issues. During a flood event, water that would

normally pass through the levee is instead trapped inside Pierce where it builds up against the landside of the levee. Interior flooding has a history of damage. During the spring floods of 2019 the Premier Estates nursing and critical care facility was forced to evacuate 42 residents before the facility was inundated and significantly damaged by rising floodwater. These residents were ultimately displaced from Pierce for more than four months while the facility was repaired (Siouxland Proud, 2019).

No Action Alternative: Impacts would be indirect, permanent, and neutral. This alternative would not alter the existing Federally Authorized Levee System in the watershed. The levee system would continue to exist in its current state.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, major, long-term, and beneficial. This alternative would alter a portion of the Federally Authorized Levee System located within the watershed. The existing North Branch Elkhorn River right bank levee does not meet the design requirements for minimum freeboard and therefore requires improvements to restore the system to its originally authorized purpose. The North Branch Elkhorn right bank levee would be altered to meet current design requirements under the levee improvements portion of this alternative. That alteration would include the installation of seepage berms, increasing the overall height of the levee, modification or replacement of drainage structures, and installing two pump stations to reduce water buildup on the landside of the levee. All levee alterations would follow USACE regulations and requirements and receive USACE Section 408 authorization for construction. Once the improvements to the levee are completed, the levee system will be able to meet the requirements of USACE, FEMA, and NRCS CPS-356.

Road Raise, Berm, and Nonstructural Alternative: Impacts would be indirect, permanent, and neutral. This alternative would not alter the existing Federally Authorized Levee System in the watershed.

3.04 PLANT AND ANIMAL RESOURCES

FISH AND WILDLIFE

The North Fork Elkhorn River Watershed falls into Nebraska's Tallgrass Prairie Ecoregion, which covers roughly the eastern quarter of the state. Once characterized as a sea of grass extending for hundreds of miles, less than 1% of tallgrass prairie remains in the continental United States. In Nebraska, approximately 2% of the state's tallgrass prairie remains. The region is home to over 300 species of resident and migratory birds, 55 mammal species, 53 amphibian and reptile species, and uncounted insects. Vegetation is diverse and includes hundreds of species ranging from deciduous woodlands to saline wetlands. Streams in the region were historically meandering and braided with wide, shallow channels and floodplains composed of wet meadows and freshwater marshes (Schneider et al., 2011).

No Action Alternative: This impact would be indirect, minor, permanent, and adverse. This alternative would allow the current conditions of flooding to continue affecting fish and wildlife

populations and habitat throughout the watershed. Flooding can degrade water quality, aquatic / riparian habitat, and upland habitat by depositing debris and pollutants or scouring away vegetation and soil. Some species can be washed away or drowned by floodwater or become more susceptible to illness due to exposure to contaminants carried by floodwaters.

Levee Improvements and Diversion Channels Alternative: This impact would be indirect, minor, permanent, and adverse. This alternative would not reduce flooding outside of Pierce. This alternative would allow the current conditions of flooding to continue affecting fish and wildlife populations and habitat throughout the watershed. Flooding can degrade water quality, aquatic / riparian habitat, and upland habitat by depositing debris and pollutants or scouring away vegetation and soil. Some species can be washed away or drowned by floodwater or become more susceptible to illness due to exposure to contaminants carried by floodwaters.

Road Raise, Berm, and Nonstructural Alternative: This impact would be indirect, minor, permanent, and adverse. This alternative would not reduce flooding outside of Osmond. This alternative would allow the current conditions of flooding to continue affecting fish and wildlife populations and habitat throughout the watershed. Flooding can degrade water quality, aquatic / riparian habitat, and upland habitat by depositing debris and pollutants or scouring away vegetation and soil. Some species can be washed away or drowned by floodwater or become more susceptible to illness due to exposure to contaminants carried by floodwaters.

THREATENED AND ENDANGERED SPECIES

The Endangered Species Act of 1973 provides a framework to conserve and protect threatened and endangered species, and their habitats. The USFWS maintains and enforces the national list of threatened and endangered species and assists states in developing conservation programs. In Nebraska, the NGPC maintains the state list of threatened and endangered species. The Fish and Wildlife Coordination Act of 1934, as amended through PL 116-188, directs the USFWS to investigate and report on any proposed Federal actions and provide recommendations to minimize impacts on fish and wildlife resources.

Information from the following resources was utilized to compile the initial list of species that may existing within the watershed area:

CERT and IPaC reports are available in Appendix E.

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

The American burying beetle is the largest carrion beetle in North America, reaching lengths of 1.0 – 1.8 inches. The beetles are black with orange-red markings. The species is nocturnal, burying themselves under vegetation litter or burrowing into soil in the daytime. At night, they fly to find carrion and are active from late spring through early fall. The beetles are native to 35 states and three eastern Canadian provinces, and occupy a variety of habitats, burying themselves in soil to hibernate for the winter. Risks such as habitat loss or alteration and artificial lights affect

most populations, as well as impacts due to agricultural land uses. This species may occur within the watershed in locations where perennial vegetation exists on areas with mesic soil conditions.

No Action Alternative: No effect. While no official surveys had been conducted at the time of this writing, this project is outside of the known habitat range of the American burying beetle.

Levee Improvements and Diversion Channels Alternative: May affect, not likely to adversely affect. While no official surveys had been conducted at the time of this writing, this project is outside of the known habitat range of the American burying beetle.

Road Raise, Berm, and Nonstructural Alternative: May affect, not likely to adversely affect. While no official surveys had been conducted at the time of this writing, this project is outside of the known habitat range of the American burying beetle.

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

The Eastern black rail is a sparrow-sized marsh bird, and the smallest rail in North America. Adults have an average length of four to six inches and a wingspan of 8.7 – 11 inches. The birds are gray black in coloration, with white speckled upperparts, and has a grayish crown, chestnut-colored nape of the neck, and a short tail. The birds are secretive and difficult to detect. In some locations, males will sing throughout the day and night, while in others they only sing at night. During breeding and wintering seasons, Eastern black rails fly very little and will flush for only a short distance when pursued, mostly remaining on the ground and running quickly through dense vegetation. This species is unlikely to occur within the watershed due to their transient migrant nature in Nebraska.

No Action Alternative: No effect. The Eastern black rail is a transient migrant species in the state of Nebraska.

Levee Improvements and Diversion Channels Alternative: No effect. The Eastern black rail is a transient migrant species in the state of Nebraska.

Road Raise, Berm, and Nonstructural Alternative: No effect. The Eastern black rail is a transient migrant species in the state of Nebraska.

Northern Long-Eared Bat (*Myotis septentrionalis*) – Federally and State Endangered

The Northern long-eared bat is a medium-sized bat about 3 to 3.7 inches in length with a wingspan of 9 to 10 inches. The species range includes 37 states and much of Canada. The bats spend winter hibernating in caves and mines with constant temperatures, high humidity, and little air movement. During the summer, the bats roost singly or in colonies underneath bark, in cavities or crevices of trees. The greatest threat to Northern long-eared bats is white-nose syndrome, a fungal infection which affects them during hibernation. This species may occupy woodlands and forests, especially in proximity to riparian areas where trees are used as roosting sites and foraging occurs in close proximity.

No Action Alternative: There would be no change in habitat for Northern long-eared bat (NLEB). Flooding would have minimal impacts on habitat for NLEB.

Levee Improvements and Diversion Channels Alternative: May affect, not likely to adversely affect. The NLEB range is within the ARA of this alternative; however, there are no known hibernacula within 5.0 miles, any known maternity roosts within 1.5 miles, or any known swarming/staging areas within the ARAs. NLEB may roost underneath bark, in cavities, or in crevices of both live and dead trees that would be cleared under this alternative. They may also roost under road bridges or in culverts. Conservation measures including dates to avoid disturbance to suitable habitat would be implemented as necessary to avoid adverse impacts.

Road Raise, Berm, and Nonstructural Alternative: May affect, not likely to adversely affect. The NLEB range is within the ARA of this alternative; however, there are no known hibernacula within 5.0 miles, any known maternity roosts within 1.5 miles, or any known swarming/staging areas within the ARAs. NLEB may roost underneath bark, in cavities, or in crevices of both live and dead trees that would be cleared under this alternative. They may also roost under road bridges or in culverts. Conservation measures including dates to avoid disturbance to suitable habitat would be implemented as necessary to avoid adverse impacts.

Pallid Sturgeon (*Scaphirhynchus albus*) – Federally and State Endangered

The pallid sturgeon is a prehistoric fish species, with the sturgeon family having been in existence for about 70 million years. They have a cartilage skeleton, similar to sharks. The fish prefer large, deep turbid river channels, usually in strong current over firm sand or gravel. When young, the fish eat aquatic insects, but after growing larger they primarily eat other fish. The pallid sturgeon can grow up to six feet long and weigh up to 80 lbs. They have a long flat head, and their bodies have rows of hard, bony plates instead of scales. The tail is long and slender, and the mouth contains no teeth. Pallid sturgeon have been known to live as long as 80 years. They are a migratory species, moving throughout the Missouri and Mississippi river systems. This species is not known to occur in the watershed except potentially where the North Fork joins the Elkhorn River and other locations downstream of that point.

No Action Alternative: No effect. The pallid sturgeon is dependent on adequate flows in the Elkhorn and lower Platte River to maintain its habitat. This alternative would not result in any depletion to riverine flows and would therefore not affect the habitat.

Levee Improvements and Diversion Channels Alternative: No effect. The pallid sturgeon is dependent on adequate flows in the Elkhorn and lower Platte River to maintain its habitat. This project would not result in any depletion of riverine flows and would therefore not affect the habitat.

Road Raise, Berm, and Nonstructural Alternative: No effect. The pallid sturgeon is dependent on adequate flows in the Elkhorn and lower Platte River to maintain its habitat. This project would not result in any depletion of riverine flows and would therefore not affect the habitat.

Lake Sturgeon (*Acipenser fulvescens*) – Federally Proposed and State Threatened

Lake sturgeon are benthic fish that occupy bottom habitats of large freshwater lakes and rivers. The fish have a long lifespan with males living around 55 years and females living from 80-150 years. They can grow to be over six feet in length and weigh nearly 200 lbs. They spend the majority of their lives in lake and coastal systems, but migrate into large rivers to reproduce, laying their eggs in rocky, swift flowing portions of the river. Larval lake sturgeon are often found in riverine habitats with fine sediments and slightly slower water velocities. This species is not known to occur in the watershed except potentially where the North Fork joins the Elkhorn River and other locations downstream of that point.

No Action Alternative: No effect. The lake sturgeon is dependent on adequate flows in the Elkhorn and lower Platte River to maintain its habitat. This alternative would not result in any depletion to riverine flows and would therefore not affect the habitat.

Levee Improvements and Diversion Channels Alternative: No effect. The lake sturgeon is dependent on adequate flows in the Elkhorn and lower Platte River to maintain its habitat. This project would not result in any depletion of riverine flows and would therefore not affect the habitat.

Road Raise, Berm, and Nonstructural Alternative: No effect. The lake sturgeon is dependent on adequate flows in the Elkhorn and lower Platte River to maintain its habitat. This project would not result in any depletion of riverine flows and would therefore not affect the habitat.

Interior Least Tern (*Antillarum athalassos*) – State Endangered

The Interior least tern is the smallest North American tern. Adults average 8-10 inches in length, with a 20-inch wingspan. Adults are gray above and white below, with a black cap, black nape and eye stripe, white forehead, yellow bill with a black or grown trip, and yellow to orange legs. They have narrow, pointed wings, and a forked tail. Nesting habitat is typically bare or sparsely vegetated sand, sandbars, and islands. The birds prefer open habitat and tend to avoid thick vegetation. This species may occupy open sandbars, especially in the lower portion of the watershed, near where the North Fork empties into the Elkhorn River and other points downstream.

No Action Alternative: Flooding may cause habitat destruction through erosion, sedimentation, and degraded water quality. Impacts would be indirect, minor, temporary, and adverse.

Levee Improvements and Diversion Channels Alternative: May affect, not likely to adversely affect. The Interior least tern is dependent on open sandbar habitat on large rivers, including the Platte River, and adequate flows help maintain its habitat. This project would not result in any depletion to flows in the lower Platte River. Any suitable nesting habitat in the vicinity of the ARA is unlikely. A survey would be completed by a qualified biologist if construction occurs within sight or sound of suitable habitat between April 15 and August 15.

Road Raise, Berm, and Nonstructural Alternative: May affect, not likely to adversely affect. The Interior least tern is dependent on open sandbar habitat on large rivers, including the Platte River, and adequate flows help maintain its habitat. This project would not result in any depletion to flows in the lower Platte River. Any suitable nesting habitat in the vicinity of the ARA is unlikely. A survey would be completed by a qualified biologist if construction occurs within sight or sound of suitable habitat between April 15 and August 15.

Sturgeon Chub (*Macrhybopsis gelida*) – Federally Proposed and State Endangered

The sturgeon chub is a small minnow species reaching up to four inches in length. It is recognized by its long, flat snout with a barbell at the corner of its mouth. The fish are brown to olive colored on their back and white or silver on their belly with relatively large and clear fins. The sturgeon chub is found in fast, free-flowing rivers with high turbidity and low visibility. It is believed that reproduction occurs in late spring to early summer. Spawning takes place by broadcast in fast-moving water. This species is not known to occur in the watershed except potentially where the North Fork joins the Elkhorn River and other locations downstream of that point.

No Action Alternative: No effect. The sturgeon chub is dependent on adequate flows in the Elkhorn and lower Platte River to maintain its habitat. This alternative would not result in any depletion to riverine flows and would therefore not affect the habitat.

Levee Improvements and Diversion Channels Alternative: No effect. The sturgeon chub is dependent on Platte River flows to maintain its habitat. This project would not result in any depletion of flows in the Platte River and would therefore not affect the habitat.

Road Raise, Berm, and Nonstructural Alternative: No effect. The sturgeon chub is dependent on adequate flows in the Elkhorn and lower Platte River to maintain its habitat. This project would not result in any depletion of riverine flows and would therefore not affect the habitat.

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

Piping plover are small shorebirds with a sand-colored upper body, white underside, and orange legs. During breeding season, adults have a black forehead, black breast band, and orange bill. They are migratory birds, breeding in the Northern Great Plains, Atlantic Coast, and shorelines of the Great Lakes in the spring and summer, and wintering in the Gulf of America. The birds prefer wide, flat, sandy beaches with little vegetation. Nesting territories often include small creeks or wetlands. This species may occupy open sandbars, especially in the lower portion of the watershed, near where the North Fork empties into the Elkhorn River and other points downstream.

No Action Alternative: Flooding may cause habitat destruction through erosion, sedimentation, and degraded water quality. Impacts would be indirect, minor, temporary, and adverse.

Levee Improvements and Diversion Channels Alternative: May affect, not likely to adversely affect. The piping plover is dependent on open sandbar habitat on large rivers, including the Platte

River, and adequate flows help maintain its habitat. This project would not result in any depletion to flows in the lower Platte River. Any suitable nesting habitat in the vicinity of the ARA is unlikely. A survey would be completed by a qualified biologist if construction occurs within sight or sound of suitable habitat between April 15 and August 15.

Road Raise, Berm, and Nonstructural Alternative: May affect, not likely to adversely affect. The piping plover is dependent on open sandbar habitat on large rivers, including the lower Platte River, and adequate flows help maintain its habitat. This project would not result in any depletion to flows in the lower Platte River. Any suitable nesting habitat in the vicinity of the ARA is unlikely. A survey would be completed by a qualified biologist if construction occurs within sight or sound of suitable habitat between April 15 and August 15.

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

The rufa red knot is a stocky, robin-sized shorebird with a 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 the 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. This species is unlikely to occur within the watershed due to their transient migrant nature in Nebraska.

No Action Alternative: No effect. The rufa red knot is a transient migrant species in the state of Nebraska.

Levee Improvements and Diversion Channels Alternative: No effect. The rufa red knot is a transient migrant species in the state of Nebraska.

Road Raise, Berm, and Nonstructural Alternative: No effect. The rufa red knot is a transient migrant species in the state of Nebraska.

Scaleshell Mussel (*Leptodea leptodon*) – Federally and State Endangered

The scaleshell mussel is a small freshwater mussel. It is oval with a thin outer shell that is smooth and yellow green to brown in color with numerous faint green rays. The outer shell is thin and in females looks like scales. The interior is faint pink to purple in color and is iridescent like the inside of an abalone shell. The mussel reaches lengths of up to four inches. They are most likely to be found in clear, fast-moving streams and rivers with gravel or sand bottoms. They burrow into the gravel or sand and require good water quality to thrive. This species is unlikely to occur within the watershed and is primarily found in large turbid rivers such as the Missouri River and in associated backwaters and lower tributaries.

No Action Alternative: Flooding may cause habitat destruction through scouring, sedimentation, and degraded water quality. Impacts would be indirect, minor, temporary, and adverse.

Levee Improvements and Diversion Channels Alternative: May affect, not likely to adversely affect. While no official surveys had been conducted at the time of this writing, the project area is outside of the known habitat range of the scaleshell mussel.

Road Raise, Berm, and Nonstructural Alternative: May affect, not likely to adversely affect. While no official surveys had been conducted at the time of this writing, the project area is outside of the known habitat range of the scaleshell mussel.

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

A native, long-lived perennial orchid, small white lady's slipper grows from a fleshy rhizome. It forms in clumps with as many as 50 single stems coming from a single rhizome. The plant grows to heights of four to 14 inches with two to four leaves forming on the top half of the stem. Leaves are long and slender with parallel veins. One flower forms per stem from mid-May to mid-June. The lower lip of the flower is an inflated white to pale purple pouch. Extending from the sepals on the stem into the pouch is a bright yellow upper lip which is often splashed with red speckles. A single leaf extends over the flower. The plant is found in wet meadows and moist prairies with deep, moist soils and full sun. This species may occur in locations where high quality vegetated wet meadows exist within the watershed.

No Action Alternative: No effect. Most of the project area is outside the known habitat range of the small white lady's slipper.

Levee Improvements and Diversion Channels Alternative: May affect, not likely to adversely affect. While no official surveys had been conducted at the time of this writing, the project area is outside of the known habitat range of the small white lady's slipper.

Road Raise, Berm, and Nonstructural Alternative: May affect, not likely to adversely affect. While no official surveys had been conducted at the time of this writing, the project area is outside of the known habitat range of the small white lady's slipper.

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

The Western prairie fringed orchid grows from a fleshy, tuberous root and has a single stem with alternate leaves. The long leaves come together at the base of the stem and the veins are parallel. The plant can grow up to three feet in height, but an average height is 18 to 30 inches. The flowers form an open arrangement at the top of the stem. Approximately two dozen creamy white or greenish flowers are present on each stalk. The lower lip of the flowers is divided into three feathery and fringed lobes. The flower can be found in the tallgrass prairie landscape. In eastern Nebraska they are found in upland prairies and loess soils. In central and northeast Nebraska, they grow in wet prairies and meadows. This species may occur in locations where high quality vegetated wet meadows exist within the watershed.

No Action Alternative: No effect. The orchid's habitat consists of high quality, mesic prairies which may occur within the ARAs or on the lower Platte River corridor. As this alternative would not disturb and suitable habitat and would not result in any depletion of flows in the lower Platte River, it would not alter the orchid's habitat.

Levee Improvements and Diversion Channels Alternative: May affect, not likely to adversely affect. The orchid's habitat consists of high quality, mesic prairies. No surveys for the species have been conducted in the vicinity of the ARAs. Any suitable habitat will be surveyed during the flowering period by a qualified botanist prior to project implementation. Additionally, this project would not result in any depletion to flows in the lower Platte River and would not alter the orchid's habitat in that location.

Road Raise, Berm, and Nonstructural Alternative: May affect, not likely to adversely affect. The orchid's habitat consists of high quality, mesic prairies. No surveys for the species have been conducted in the vicinity of the ARAs. Any suitable habitat will be surveyed during the flowering period by a qualified botanist prior to project implementaiton. Additionally, this project would not result in any depletion to flows in the lower Platte Riverand would not alter the orchid's habitat in that location.

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

Whooping cranes are one of the rarest birds in North America. Standing nearly five feet tall with a wingspan of 7.5 feet, the birds are white with rust-colored patches on the tops and backs of their heads. They have yellow eyes and long, black legs and bills. Their primary wing feathers are black but are only visible during flight. The birds breed in northern Canada and winter in southern Texas. They begin their fall migration south in mid-September and begin the spring migration north in late March or early April, migrating over 2,000 miles each year. This species may occur occasionally during migratory periods in the spring and fall and use open channel streams and associated wetlands on the eastern edge of the migratory range in Nebraska.

No Action Alternative: No effect. This project (ARA's) is outside of the primary migration corridor for the whooping crane.

Levee Improvements and Diversion Channels Alternative: No effect. This project (ARA's) is outside of the primary migration corridor for the whooping crane.

Road Raise, Berm, and Nonstructural Alternative: No effect. This project (ARA's) is outside of the primary migration corridor for the whooping crane.

Proposed and Candidate Species

The following list includes species which may be found in the watershed and are undergoing review and are subject to reclassification before the project moves into the implementation phase. These species include:

- Proposed Species
    - Blanding's Turtle (*Emydoidea blandingii)*
    - Tricolored Bat (*Perimyotis subflavus*)
    - Hoary Bat (*Lasiurus cinereus*)
    - Plain Pocketbook Mussel (*Lampsilis cardium*)
    - Plains Topminnow (*Fundulus sciadicus*)
    - Regal Fritillary (*Speyeria idalia*)
    - Monarch (*Danus plexippus*)
    - Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*)

INVASIVE SPECIES

Invasive species are non-native to an ecosystem. Once established, these species may cause irreparable harm, introduce disease, out-compete native species, change habitat, damage equipment or infrastructure, and negatively impact local and national economies. While there is not a complete list of locations where invasive species are found, the Nebraska Invasive Species Council (NISC) maintains information on potential and known invasive species in Nebraska.

There are dozens of invasive species that have the potential to spread within the watershed. This may include aquatic species, insects, plants, birds, mammals, and even pathogens. NISC prepared an *Adaptive Management Plan* in 2021 (NISC, 2021) to provide guidance on minimizing the impacts of non-native invasive species through prevention and management. Some of their strategies include outreach campaigns to educate residents about the harm invasive species can cause, watercraft inspection and decontamination, and systematic surveys of types, sizes, and locations of invasive species populations.

Potential invasive species that could impact the North Fork Elkhorn River watershed were identified using information provided by the NISC. A best available, although non-comprehensive, list of these potential invasive species is included below:

- Invasive Plant Species
    - Canada Thistle (*Cirsium arvense*)
    - Creeping Foxtail (*Alopecurus arundinaceus*)
    - Downy Brome (*Bromus tectorum*)
    - Garlic Mustard (*Alliaria petiolate*)
    - Japanese & Giant Knotweed (*Fallopia japonica, F. sachalinensis*)
    - Leafy Spurge (*Euphorbia esula*)
    - Musk Thistle (*Carduus nutans*)
    - Osage Orange (*Maclura pomifera*)
    - Phragmites Common Reed (*Phragmites australis*)
    - Plumeless Thistle (*Carduus acanthoides*)
    - Purple Loosestrife (*Lythrum salicaria, L. virgatum*)
- Invasive Mammal and Bird Species
    - Eurasian Collared-Dove (*Streptopelia decaocto*)

    - European Starling (*Sternus vulgaris*)
    - Feral Hog (*Sus scrofa*)
    - House Sparrow (*Passer domesticus*)
    - Rock Dove / Feral Pigeon (*Columba livia*)
- Invasive Insect Species
    - Emerald Ash Borer (*Agrilus planipennis Ledeb*).
    - Spotted Lanternfly (*Lycorma delicatula*)
    - Longhorned Beetle (*Anoplophora glabripennis*)
    - Brown Marmorated Stink Bug (*Halyomorpha halys*)
    - Cereal Leaf Beetle (*Oulema melanopus*)
    - Japanese Beetle (*Popillia japonica*)
    - Mountain Pine Beetle (*Dendroctonus ponderosae*)
    - Pine Shoot Beetle (*Tomicus piniperda*)
    - Sirex Woodwasp (*Sirex noctilio F.*)
    - Spongy Moth (*Lymantria dispar*)
- Invasive Aquatic Species
    - Zebra and Quagga Mussels (Dreissena polymorpha, Dreissena rostiformis)
    - Asian Clam (*Corbicula fluminea*)
    - Bighead Carp (*Hypophthalmichthys nobilis*)
    - Chinese Mystery Snail (*Cipangopaludina chinensis*)
    - Chytrid Fungus (*Batrachochytrium dendrobatidis*)
    - Eurasian Watermilfoil (*Myriophyllum spicatum*)
    - Red Swamp Crayfish (*Procambarus clarkii*)
    - Rudd (*Scardinius erythrophthalmus*)
    - Rusty Crayfish (*Orconectes rusticus*)
    - Silver Carp (*Hypophthalmichthys molitrix*)
    - White Perch (*Morone americana*)

No Action Alternative: This impact would be indirect, minor, permanent, and adverse. Floodwaters have the capability to carry and spread invasive species to new areas. Under the no action alternative, new invasive species may spread to the watershed, or existing invasive species may expand their presence in the watershed due to flooding events.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, negligible, and short term. Invasive species would have the potential to be introduced or spread due to construction activities, but this alternative would minimize the potential effect of invasive species in the watershed due to measures which would be taken during construction. Seeding plans for each project site would include native species certified by the NRCS State Biologist to ensure erosion is minimized and invasive species or noxious weeds are not introduced or spread. Any watercraft or heavy construction equipment utilized will be cleaned, drained, dried, and properly decontaminated if transported between sites.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, negligible, and short term. Invasive species would have the potential to be introduced or spread due to construction activities, but this alternative would minimize the potential effect of invasive species in the watershed due to measures which would be taken during construction. Seeding plans for each project site would include native species certified by the NRCS State Biologist to ensure erosion is minimized and invasive species or noxious weeds are not introduced or spread. Any watercraft or heavy construction equipment utilized will be cleaned, drained, dried, and properly decontaminated if transported between sites.

MIGRATORY BIRDS / BALD & GOLDEN EAGLES

The Migratory Bird Treaty Act of 1918 and the Bald and Golden Eagle Protection Act of 1940, both of which have been amended multiple times since their inception, prohibit the taking of protected migratory bird species, bald eagles, and golden eagles without special permission. Under these two acts, 'taking' includes the pursuit, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting to engage in any such conduct towards the birds themselves as well as any parts, such as eggs, feathers, nests, etc. 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 (turkey, quail, etc.).

In Nebraska the nesting season for migratory birds occurs between April 1 – July 15. There are exceptions to this range. For example, raptors can be expected to nest in woodland habitats from February 1 – July 15, whereas sedge wrens, which occur in some wetland habitats, normally nest from July 15 – September 10. Golden eagles can be found in the Nebraska panhandle and commonly range into the central portion of the state during spring and fall. Bald eagles can be found throughout the entire state year-round, especially near water in the winter and spring. Multiple migratory bird species are likely present within the watershed. According to the Nebraska Ornithologists' Union, 250 species of birds have been identified in Pierce County alone, many of them migratory (NOU, 2024).

Birds of conservation concern (BCC) are species, subspecies, and populations of migratory birds that are likely to become candidates for listing on the Endangered Species list and thus warrant particular concern during the planning process. Bird species of conservation concern, as detailed in the IPaC report accessed on March 17, 2025, include:

- American Golden Plover (*Pluvialis dominica*)
    - Found in burned, plowed, and harvested agricultural fields, pastureland, sod farms, estuaries, mudflats, prairie, and tundra.
- Bald Eagle (*Haliaeetus leucocephalus*)
    - Found within two and a half miles of the coast, bays, rivers, lakes, or other bodies of water.
- Black Tern (*Chlidonias niger*)

    - Found in large freshwater wetlands, usually in dense marshes on the edges of shallow lakes of the open prairies or northern forests.
- Bobolink (*Dolichonyx oryzivorus*)
    - Found in damp meadows and natural prairies, or hayfields.
- Chimney Swift (*Chaetura pelagica*)
    - Found in caves and hollow trees, or other artificial sites with vertical surfaces and low light.
- Franklin's Gull (*Leucophaeus pipixcan*)
    - Found in large prairie marshes with low vegetation density.
- Grasshopper Sparrow (*Ammodramus savannarum perpallidus*)
    - Found in grasslands, pariries, hayfields, and open pastures with patches of bare ground.
- Hudsonian Godwit (*Limosa haemastica*)
    - Found in freshwater tundra marshes and bogs, interior wetlands, coastal lagoons, marshes, and ocean coasts.
- Lesser Yellowlegs (*Tringa flavipes*)
    - Found in open deciduous or coniferous forest mosaics with wet or sedge meadows and marshes.
- Marbled Godwit (*Limosa fedoa*)
    - Found in shortgrass prairies near wetlands.
- Northern Harrier (*Circus hudsonius)*
    - Found in open habitats such as grasslands, marshes, meadows, and fields.
- Pectoral Sandpiper (*Calidris melanotos*)
    - Found in grassy shore edges, edges of tidal marshes, flooded fields, wet meadows, plowed fields, and dry prairie.
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)
    - Found in forest edges, orchards, open pine woods, and groves of tall trees in open country.
- Ruddy Turnstone (*Arenaria interpres morinella*)
    - Found in high arctic tundra, along coastlines, and near marshes, streams, and ponds when migrating.
- Short-billed Dowitcher (*Limnodromus griseus*)
    - Found in mudflats, tidal wetlands, and shallow freshwater impoundments.
- Sprague's Pipit (*Anthus spragueii*)
    - Found in native mixed-grass prairie of the northern great plains.
- Western Grebe (*Aechmophorus occidentalis*)
    - Found on freshwater lakes and marshes with extensive open water, or brackish bays, estuaries, or sheltered coasts.
- Willet (*Tringa semipalmata*)
    - Found in marshes, wet meadows, mudflats, and beaches.

No Action Alternative: This impact would be indirect, minor, long-term, and adverse. Flooding events have the potential to alter or destroy habitat utilized by migratory birds and eagles in the watershed.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, negligible, short-term, and neutral. This alternative would minimize potential negative effects on migratory birds and eagles due to the utilization of best management practices during construction. The project would comply with the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act. To avoid impacts to migratory birds there would be no tree clearing from April 1 to July 15, or a nesting survey will be required. Eagle surveys would be conducted within ½ mile of each project site prior to construction. If bald eagles are nesting in the area, consultation with NGPC and USFWS would be initiated. Bird species of conservation concern, as detailed in the IPaC report for the project ARA accessed on September 26, 2024, include:

- Bald Eagle (*Haliaeetus leucocephalus*)
- Black Tern (*Chlidonias niger*)
- Bobolink (*Dolichonyx oryzivorus*)
- Chimney Swift (*Chaetura pelagica*)
- Franklin's Gull (*Leucophaeus pipixcan*)
- Grasshopper Sparrow (*Ammodramus savannarum perpallidus*)
- Hudsonian Godwit (*Limosa haemastica*)
- Lesser Yellowlegs (*Tringa flavipes*)
- Marbled Godwit (*Limosa fedoa*)
- Northern Harrier (*Circus hudsonius*)
- Pectoral Sandpiper (*Calidris melanotos*)
- Red-headed Woodpecker (*Melanerpes erythrocephalus*)
- Western Grebe (*Aechmophorus occidentalis*)

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, negligible, short-term, and neutral. This alternative would minimize potential negative effects on migratory birds and eagles due to the utilization of best management practices during construction. The project would comply with the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act. To avoid impacts to migratory birds there would be no tree clearing from April 1 to July 15, or a nesting survey will be required. Eagle surveys would be conducted within ½ mile of each project site prior to construction. If bald eagles are nesting in the area, consultation with NGPC and USFWS would be initiated. Bird species of conservation concern, as detailed in the IPaC report for the project ARA accessed on September 26, 2024, include:

- Franklin's Gull (*Leucophaeus pipixcan*)
- Northern Harrier (*Circus hudsonius*)

3.05 FISH AND WILDLIFE HABITAT

FOREST RESOURCES

Based on land use data, forested areas made up 2% (3,610 ac) of the watershed's total area in 2023 (USDA, 2023). Historically, woodlands were found primarily in stream valleys and riparian areas where they were protected from regular fires. Native woodlands in floodplain areas include mainly cottonwood (*Populus deltoides*), willows (*Salix Babylonic,* and *Salix nigra*), boxelders (*Aver negundo*), and American elm (*Ulmus americana*). Eastern redcedar (*Juniperus virginana)* has become more prominent during the last few decades and now dominates many prairies and woodlands. (Schneider et al., 2011). Forested areas make up 6% (40 ac) of the Pierce ARA, and 1% (0.4 ac) of the Osmond ARA.

No Action Alternative: This impact would be indirect, minor, permanent, and adverse. Woodlands would continue to be threatened by flooding in the watershed. The majority of wooded areas are established along waterways in this region and are particularly susceptible to the erosive forces of floodwaters. Trees can be uprooted and carried downstream or undermined by erosion and left to die.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, minor, permanent, and adverse. Approximately 2.7 acres of trees would be removed by the construction of this alternative. These trees do not represent cohesive forested/woodland areas but rather are composed of individual trees scattered throughout the project area. No mitigation would be required. This alternative would not provide flood protection for any woodlands.

Road Raise, Berm, and Nonstructural Alternative: This impact would be indirect, minor, permanent, and adverse. This alternative would not directly remove any trees but also would not provide flood protection to any woodlands. Woodlands would continue to be threatened by flooding in the watershed. The majority of wooded areas are established along waterways in this region and are particularly susceptible to the erosive forces of floodwater. Trees can be uprooted and carried downstream or undermined by erosion and left to die.

RIPARIAN AREAS

Riparian areas are transition zones between terrestrial and aquatic ecosystems, generally along rivers, streams, or other bodies of flowing water. They are present throughout the watershed along the North Fork Elkhorn River and its various tributaries. There are an estimated 1,374 acres of riparian areas within the watershed (USDA, 2023). These riparian areas are primarily located along stream corridors and surrounding wetlands throughout the watershed. The Pierce ARA contains an estimated 23 acres of riparian areas. There are no riparian areas in the Osmond ARA.

No Action Alternative: This impact would be indirect, minor, permanent, and adverse. Riparian areas within the watershed would continue to be damaged by flooding. Floodwaters can scour away soil and vegetation within riparian areas or choke them with debris or sediment deposited

by flooding. Many riparian areas are found adjacent to crop fields and have been altered and degraded over time to better suit agricultural purposes, making them even more susceptible to flood damage due to the lack of perennial vegetation. This alternative would not reduce the risk of flooding damage to any riparian areas.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, minor, long-term, and adverse. The majority of the stream areas impacted by this alternative are made up of ephemeral streams and canals which do not support any riparian areas. A small portion of the intermittent stream would be impacted, which does support a riparian area. This would consist of approximately 0.05 acres of riparian area impacted by construction. This alternative would not reduce the risk of flooding damage to any riparian areas.

Road Raise, Berm, and Nonstructural Alternative: This impact would be indirect, minor, permanent, and adverse. This alternative would be constructed in the vicinity of an ephemeral channel which does not support any riparian area. Therefore, no riparian areas would be impacted directly. However, this alternative would not reduce the risk of flooding damage to riparian areas either. Riparian areas within the watershed would continue to be damaged by flooding.

3.06 HUMAN RESOURCES

FLOOD DAMAGES

A detailed hydrologic and hydraulic flooding model was developed in order to understand the sources and severity of flooding within the watershed. More information about the modeling process is available in Appendix D. The results of the H&H model were utilized to determine the extents of existing flooding damages within Pierce and Osmond. Under the existing conditions of a 10-year (10% annual chance) flood event, it was found that approximately 38 buildings in Pierce and 24 buildings in Osmond are inundated. During a 100-year (1% annual chance) flood event, it was found that approximately 104 buildings in Pierce and 67 buildings in Osmond are inundated. Additionally, street flooding is a recurring issue in both communities. In Osmond, Highway 20 is inundated during a 100-year flooding event as well as local streets. Pierce experiences extensive street flooding during a 100-year flooding event, including Highway 13.

No Action Alternative: This impact would be indirect, major, permanent, and adverse. Under this alternative it is estimated that approximately $2,921,600 in flooding damage would continue to occur on an annualized basis in the watershed. This damage estimate includes structural damage to buildings and income losses to businesses. Monetary damage to agricultural lands was not estimated. An indirect effect of the no action alternative would be the continued threat of flood damage to the watershed. Under this alternative it is estimated that during a 100-year flooding event, 104 budlings in Pierce and 67 buildings in Osmond are inundated.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, major, long-term, and beneficial. After the alternative is installed, approximately 80 buildings will be removed from the 100-year flood inundation area in the City of Pierce. This would greatly

reduce flood damages in the City. The alternative is designed to reduce flood damage up to and including the 100-year recurrence interval. The potential for flood damage remains during events greater than the 100-year recurrence interval.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, major, long-term, and beneficial. After the alternative is installed, approximately 15 buildings will be removed from the 100-year flood inundation area in the City of Osmond. This would greatly reduce flood damages in the City. The alternative is designed to reduce flood damage up to and including the 100-year recurrence interval. The potential for flood damage remains during events greater than the 100-year recurrence interval.

COSTS

To quantify the costs of flood damage, the project team calculated the estimated average annual monetary flood damages to buildings lands based on existing conditions in the watershed. Hydrologic and hydraulic modeling results were assessed using the Federal Emergency Management Agency's (FEMA) Hazards United States (HAZUS) program. Annualized flood damages were estimated to be approximately $2,921,600 between both Pierce and Osmond. Building damages include structural damages, content loss and inventory loss; as well as income losses derived from relocation expenses, capital related losses, wage losses, and the loss of rental income. Additional information about the economic analysis is available in Appendix D.

No Action Alternative: This impact would be indirect, major, permanent, and adverse. Under this alternative it is estimated that approximately $2,921,600 in flooding damage would continue to occur on an annualized basis in the watershed. This damage estimate includes structural damage to buildings and income losses to businesses. Monetary damage to agricultural lands was not estimated. An indirect effect of the no action alternative would be the continued threat of flood damage to the watershed. Under this alternative it is estimated that during a 100-year flooding event, 104 budlings in Pierce and 67 buildings in Osmond are inundated.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, major, long-term, and beneficial. Construction of this alternative would reduce flooding damages in Pierce, producing approximately $1,429,500 in annualized flood damage reduction benefits.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, major, long-term, and beneficial. Construction of this alternative would reduce flooding damages in Osmond, producing $164,100 in annualized flood damage reduction benefits.

HISTORIC PROPERTIES AND CULTURAL RESOURCES

The Area of Potential Effects (APE) of the alternatives totals 826 acres and includes all areas that could be directly or indirectly affected by activities associated with construction of the levee improvements, diversion channel, road raises, berms, and floodproofing measures, utility relocates, access routes, staging areas, excavation, grading, tree removal, alterations to existing

roads, levees, berms, drains, bridges, building removal or modifications, sediment disposal, borrow areas, etc., as well as visual and other effects to cultural resources. Maps of the APE can be found in Appendix C.

Buried Past Consulting, LLC., (Buried Past) completed a preliminary cultural resources desktop survey to identify known cultural resources and historic properties within the one mile of the APE. The review included all previously performed archaeological and architectural surveys, recorded archaeological sites, recorded historic architectural properties, NRHP listed properties, National Historic Landmarks, and National Historic Trails. One NRHP listed property, and three archeological sites are recorded within one mile of the APE. The NRHP listed property is the Meridian Highway, a 4.5-mile-long segment of a 1911 road. The road is approximately ½ mile east of the APE and will not be impacted by the project. The archeological sites include two flour mill sites and one lithic scatter. The Osmond Mill is outside the boundaries of the APE. The Pierce Milling Company is located within the boundaries of the APE. The lithic scatter is located ½ mile away from the APE and will not be impacted by the project.

Fieldwork was carried out by Buried Past between late July and early August 2024. The staff that completed the survey and prepared the report meet Secretary of Interior qualification standards for archaeologists and historians per 36 CFR 61. Survey methods followed the guidelines of the Nebraska SHPO and consisted of pedestrian inventory and subsurface testing (shovel tests and auger tests) of areas where ground disturbance may occur. Residential properties within and adjacent to the APE where no ground disturbance will occur were photographed and evaluated for the NRHP but were not subject to pedestrian inventory.

The Buried Past field investigation did not identify any archaeological sites during the survey. No cultural materials were observed on the ground surface or recovered from subsurface tests. The survey did not find any archaeological evidence of the Pierce Milling Company mill in Gilman Park. Remains of the mill foundations may still be present in the park, but it is likely that the site has been negatively impacted by modern park construction. No cultural materials were observed on the surface of the architectural properties.

Thirty (31) architectural properties greater than 50 years of age were identified during the field inventory (see Table 4). Each of these architectural properties were evaluated for consideration to be listed in the NRHP following the guidelines in National Register Bulletin 15: *How to Apply the National Register Criteria for Evaluation*. Please see Appendix E for a copy of the cultural resources inventory report, which contains descriptions of each resource and the NRHP evaluations as well as information about previous cultural resource investigations and known sites in the vicinity of the APE.

NRCS determined that four of the architectural properties identified during the investigation were eligible for the NRHP under Criterion A because of association with significant events in local history (see Table 4). Both the St. Mary of the Seven Dolors Church and Architectural Resource #11 are outside of the APE and will not be affected by this project. No ground disturbance will occur near either resource and project features will not be visible from either resource. The historic

portion of Gilman Park is approximately 300-500 meters from the proposed levee improvements, and there will be no changes to the historic features in the park. The levee is an existing feature on the park landscape, so visual impacts to the park will be negligible. The proposed alterations to the levee will not alter any characteristics of the levee that make it eligible for the NRHP.

After the cultural resource inventory was completed, the project alternatives were expanded to include non-structural measures, and three potential borrow sites. These areas have never been investigated for cultural resources, and historic properties may be present in these locations. If a historic property is present, project activities may damage or destroy all or part of the property. Additional cultural resource investigations are necessary to determine whether this undertaking will have an adverse effect on historic properties. The uninvestigated portion of the APE totals 198 acres including three borrow areas near Pierce totaling 90 acres, 26 acres in Pierce where landowners denied access to the cultural resource investigation, and 83 acres in Osmond where houses will be modified to reduce flood damage to the structures. NRCS determined that this undertaking would have no adverse effects on the Pierce Levee or Gilman Park, but that additional cultural resource investigations are needed for 198 acres of the APE that have not been investigated for historic properties. NRCS consulted with the Nebraska State Historic Preservation Office and other consulting parties about the need to defer identification of historic properties on the 198 acres that were not included in the cultural resources investigation in accordance with 36 CFR 800.4(b)(2) and proposed a programmatic agreement executed pursuant to 36 CFR 800.14(b).

Table 4. Cultural Resources within APE

Resource #	Description	NRHP Eligibility
1	Two residences on same property. One is a story and a half structure with a gambrel roof of indeterminate age with an attached single car garage. The other residence is a ca. 1925, single story structure with a two-car garage.	Not Eligible
2	Single story, Minimal Traditional style home with a gable and wing form. This structure dates to approximately 1950. There are two associated outbuildings of newer construction but indeterminate age.	Not Eligible
3	The property at this location is a one and a half story Minimal Traditional home with a gable and wing form and vinyl siding. The structure dates to approximately 1948.	Not Eligible
4	Single-story residence of indeterminate style with multiple additions, dating to approximately 1908. A modern detached garage and small shed of indeterminate age are also located on the property. A subsurface root cellar of indeterminate age with corrugated metal door is located between the garage and house.	Not Eligible
5	Two-story residence side gabled residence of indeterminate style with multiple additions. Among the additions to the house is a single car garage. The house has an approximate construction date of 1910. An early twentieth century single car detached garage is also located on the property.	Not Eligible

Resource #	Description	NRHP Eligibility
6	Ranch style residence with a cross hipped roof dating to approximately 1949. The house has an attached three car garage. A modern shed of indeterminate age is also located on the property.	Not Eligible
7	Ranch style residence with a single car attached garage dating to approximately 1962.	Not Eligible
8	Single-story residence in the Minimal Traditional style with a gable and wing form. The residence has a two-car attached garage and dates to approximately 1956.	Not Eligible
9	St. Mary of the Seven Dolors Catholic Church is a Gothic Revival brick structure, constructed in 1911 and dedicated in 1912. The 1912 structure replaced an original church building that was originally established in the 1890s in association with a mission parish. The 1912 church originally had a slate roof. Property is outside of the APE and will not be affected by this project.	Eligible
10	The Osmond ball park was established after 1920. By the 1940s, park improvements such as stadium seating for 400 people were being made. Subsequent improvements also were made in the 1950s. Survey documented early park buildings, a storage shed/garage, and the original ball diamond improvements, as well as modern utilities.	Not Eligible
11	Pony Pratt Truss Bridge dating to the late 1910s. The bridge is shown as crossing the North Fork of the Elkhorn in the 1920 atlas. The Pratt form is one of the earliest types of truss bridges. This particular Pratt example has additional counters that form an “X” within its panels which deviates from the standard form. Connections of the members within this bridge are completed with pins. Pinned connections appear on bridges in the first half of the use of truss bridges. Property is outside of the APE and will not be affected by this project.	Eligible
12	Single-story residence with no determinate style that dates to approximately 1930.	Not Eligible
13	One and a half story cross-gabled home in the Prairie style with attached single car garage. The house dates to approximately 1915. A modern metal shed is the outbuilding at the property.	Not Eligible
14	Single story, cross-gabled home of indeterminate style that dates to approximately 1930. Outbuildings include a modified barn/shed of indeterminate age with multiple additions, a chicken coop and modern utility shed	Not Eligible
15	Residence in the National Folk style with a centered gable and enclosed front porch. Multiple additions are on the rear of the structure. The house dates to approximately 1915. Outbuildings include a modern two car garage of indeterminate age, a lean-to shed and modern prefabricated shed.	Not Eligible
16	Residence in the Minimal Traditional style of indeterminate age and a detached two car attached garage. A detached two car garage is also located on the property.	Not Eligible
17	Ranch style residence with a cross gabled roof and a two-car attached garage. A detached carport is also on the property.	Not Eligible

Resource #	Description	NRHP Eligibility
18	Ranch style residence dating to 1956 with an attached two car garage/addition.	Not Eligible
19	One and a half story residence in the National Folk style with two gabled dormers and an addition on the rear of the home. The house dates to approximately 1909.	Not Eligible
20	Residence of indeterminate style with an attached two car garage dating to 1958	Not Eligible
21	Ranch style residence with brick wall cladding beneath the window line dating to 1961.	Not Eligible
22	Duplex residence created out of two Minimal Traditional homes dating to approximately 1961 joined by two single car garages.	Not Eligible
23	City park built on the remains of a flour mill. The park includes several historic buildings that were moved to this location and serve as the Pierce Couty Historical Society Museum. There are also concrete sculptures and historic plantings from a 1950s beautification effort. No ground disturbance is proposed within the eligible portion of the park. The visual impacts from the proposed levee modifications will be negligible.	Eligible
24	Ranch style residence with a cross gabled roof and a two-car attached garage. The house dates to approximately 1969. A detached two car garage of indeterminate age is also located on the property.	Not Eligible
25	One and a half story residence with Prairie elements and has multiple additions. The house dates to approximately 1915. Outbuildings include a garage.	Not Eligible
26	One and a half story residence with Queen Anne elements and multiple additions. The house dates to approximately 1900. The site also contains several delapidated outbuildings.	Not Eligible
27	Two-story house in the American Vernacular style with additions. Notable elements include fish scale shingles in the gable peaks and rock faced cement block on the first story. The house dates to approximately 1900. Outbuildings include a garage.	Not Eligible
28	American Vernacular gable and wing residence that has multiple additions. The house dates to approximately 1915. Outbuildings include a modern metal shed.	Not Eligible
29	Levee built by U.S. Corps of Engineers in 1963 and 1964. The levee will be modified by this undertaking, but the proposed improvements will not alter any characteristics that make the levee eligible for inclusion in the NRHP.	Eligible
30	Two-story residence in the American Vernacular style with an end gable with shingle details in the gable. The house dates to approximately 1900. Outbuildings are of indeterminate age and include a shed/garage with multiple additions and a shed/barn which has also been modified	Not Eligible

Resource #	Description	NRHP Eligibility
31	One and a half story bungalow. The house dates to approximately 1910. Outbuildings are of indeterminate age and small barn, wood garage/shed and two metal buildings.	Not Eligible

No Action Alternative: This alternative would not change current conditions for any historic properties or cultural resources. There would be no Federal Action, and no immediate change to the surrounding lands. Historic properties would continue to be at risk of damage due to flooding. Structures can be inundated or destroyed completely, and archeological sites can be scoured away by floodwaters or buried by sediment deposition. This impact would be indirect, permanent, and neutral.

Levee Improvements and Diversion Channels Alternative: Two historic properties are within the APE for this alternative: Pierce Levee and Gilman Park.

The Pierce Levee is eligible for inclusion in the NRHP under Criterion A due to its role in the growth and development of the City of Pierce. The proposed levee improvements will have no adverse effect on the levee because raising the levee and adding the seepage berm will not alter any characteristics that make the levee eligible for inclusion.

Gilman Park is eligible under Criterion A as a recreational development tied to the importance of the growth of the community of Pierce. The levee improvements will have no adverse effect on Gilman Park. The historic park features are approximately 300-500 meters away from most of the levee. Temporary effects include increased noise and traffic at the park during construction. Permanent effects will be minor and consist of visual effects from the increased height of the levee and possible tree removal. Visual effects from the increased levee height will be minor because the levee will be vegetated and appear similar to existing conditions. Effects from tree removal will also be minimal because only small trees next to the levee will be removed. The trees were not part of the original plantings from the 1950s, and larger trees will obscure any visual effects from the tree removal.

No historic properties are located within the APE for the proposed diversion channels.

Fill for the levee and berm construction will be obtained from three potential borrow areas that have not yet been investigated for historic properties. If historic properties are present within these areas, excavation for fill may have an adverse effect on those properties. Prior to construction NRCS will complete a survey of the borrow areas to identify historic properties. NRCS has executed a Programmatic Agreement with SHPO and consulting parties to allow for phased identification of historic properties (Appendix E). NRCS will make a determination of effect following further investigation and consult with SHPO and consulting parties. Mitigation needs, if any, will be determined during consultation.

Road Raise, Berm, and Nonstructural Alternative: No historic properties would be affected by the road raise or berm proposed in Osmond. The St. Mary of the Seven Dolors Church

and Architectural Resource #11 are both outside the APE for this alternative. No historic properties are located within the APE of either improvement.

Twelve houses will be modified by the nonstructural alternative to prevent future flood damages. These houses were not included in the cultural resources inventory and have not been evaluated for the NRHP. Modifications for each building will be determined by the homeowners and sponsor during the design phase of the project. Potential modifications include raising the homes above the base flood elevation; installing flood vents, flood walls, berms, or sewer backflow preventers; installing floodproof building materials; or property acquisition and building demolition. The proposed modifications could be an adverse effect if any of the buildings are eligible for inclusion in the NRHP. These structures will need to be evaluated prior to any modification.

Prior to construction NRCS will complete a survey of the APE for the nonstructural improvements to identify historic properties. NRCS has executed a Programmatic Agreement with SHPO and consulting parties to allow for phased identification of historic properties (Appendix E). NRCS will make a determination of effect following the investigation and consult with SHPO and consulting parties. Mitigation needs, if any, will be determined during consultation.

LOCAL AND REGIONAL ECONOMY

The 2022 Census of Agriculture reported 2,993 farming operations throughout the counties that make up the watershed covering more than 1,710,000 acres and being operated by 5,577 producers. Of these producers, 58% resided on their operations, and 46% farm as their primary occupation. The average producer was 56 years of age and had been working in agricultural operations for 27 years. The total market value of agricultural products sold totaled $2,154,100,000, and the average net cash income per operation was more than $736,000 (USDA, 2022).

Across the Cities of Osmond and Pierce and Pierce County, the largest employment sector is educational services and the healthcare industry, followed by retail trade for the City of Osmond, manufacturing for the City of Pierce, and agriculture for Pierce County (Table 5). Given the rural nature of the watershed, farm earnings are likely to be a more substantial component of the local economy than is reflected at the city scale.

Table 5: 2022 Census Economic Statistics

Employment Industry	City of Osmond	City of Pierce	Pierce County
Agriculture, forestry, fishing and hunting, and mining	6.5%	3.7%	13.2%
Construction	6.2%	4.7%	6.9%
Manufacturing	11.7%	15.7%	11.1%
Wholesale trade	4.3%	3.9%	2.6%
Retail trade	18.2%	8.2%	8.9%

Transportation and warehousing, and utilities	11.4%	3.8%	7.1%
Information	0.0%	6.7%	2.7%
Finance and insurance, and real estate and rental and leasing	3.7%	5.5%	5.9%
Professional, scientific, and management, and administrative and waste management services	4.3%	7.0%	5.1%
Educational services, health care and social assistance	20.3%	26.6%	23.9%
Arts, entertainment, recreation, and accommodation and food services	2.5%	8.0%	5.1%
Other services, except public administration	9.5%	4.1%	4.4%
Public administration	1.5%	2.1%	3.1%

Source: US Census Bureau, 2022

No Action Alternative: This impact would be indirect, major, permanent, and adverse. Flooding would continue to impact Osmond and Pierce and surrounding agricultural areas, harming the local and regional economy. An economic burden would continue to be placed on property owners required to purchase flood insurance. Additionally, flooded roads would continue to inhibit people from going to work and prevent goods from being transported.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, major, long-term, and beneficial. Flood damage to the City of Pierce would be reduced, thus protecting the local and regional economy, and potentially reducing or removing the need for flood insurance for some property owners. The project would protect the community from future flood events and help promote community growth and prosperity. Reducing roadway flooding would allow residents to travel to work and earn an income, allow for transportation of goods, and allow for agricultural lands to be planted and harvested without interruption. Additionally, construction of the alternative may provide short-term economic benefits if watershed residents are hired to work on the project during the construction phase. Temporary disruption to agricultural or residential access roads during construction may indirectly affect the local economy.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, major, long-term, and beneficial. Flood damage to the City of Osmond would be reduced, thus protecting the local and regional economy, and potentially reducing or removing the need for flood insurance for some property owners. The project would protect the community from future flood events and help promote community growth and prosperity. Reducing roadway flooding would allow residents to travel to work and earn an income, allow for transportation of goods, and allow for agricultural lands to be planted and harvested without interruption. Additionally, construction of the alternative may provide short-term economic benefits if watershed residents are hired to work on the project during the construction phase. Temporary disruption to agricultural or residential access roads during construction may indirectly affect the local economy.

PUBLIC HEALTH AND SAFETY

The watershed contains portions of State Highway 13, State Highway 59, State Highway 98, State Highway 121, U.S. Highway 20, and U.S. Highway 81. These represent major commuting routes between communities and also serve as farm to market roads. The majority of other roads across the watershed are unpaved, making them especially vulnerable to flooding damage, and are the responsibility of counties to maintain and repair. Within the communities, most streets are the responsibility of each city to maintain and repair. Flooded and damaged roads may impede watershed access to emergency services. In Osmond, Highway 20 is inundated during a 100-year flooding event as well as local streets. Pierce experiences extensive street flooding during a 100-year flooding event, including Highway 13.

A portion of railroad operated by BNSF Railway also runs through the watershed and is essential for ethanol production. The railroad crosses the North Fork Elkhorn River in three locations in and near Osmond. During the 2019 flood, the railroad was damaged, and operations were affected.

No Action Alternative: This impact would be indirect, major, permanent, and adverse. Flooding would continue to be a threat to public health and safety in the watershed. Floods can not only kill by drowning but can make people more vulnerable to sickness and injury. Floodwater can be contaminated with human and livestock waste and chemicals, as well as debris that can cause serious harm. Additionally, flooding can block access to emergency services.

Levee Improvements and Diversion Channels Alternative: This impact would be direct major, long-term, and beneficial. After the alternative is installed, approximately 80 buildings will be removed from the 100-year flood inundation area in the City of Pierce. The flood damage reduction benefits that would be achieved with this alternative would improve the public health, safety, and welfare of the watershed by reducing the frequency and duration of flooding in and around the City of Pierce. This alternative would reduce the occurrence of overtopped roads, inundated buildings, and damage to community infrastructure and decrease the need for emergency personnel to assist during flood events. Temporary disruption to agricultural or residential access roads during construction may indirectly affect access to emergency services. Reduced exposure to floodwater will prevent potential instances of sickness and injury, as well as flood-related deaths.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct major, long-term, and beneficial. After the alternative is installed, approximately 15 buildings will be removed from the 100-year flood inundation area in the City of Osmond. The flood damage reduction benefits that would be achieved with this alternative would improve the public health, safety, and welfare of the watershed by reducing the frequency and duration of flooding in and around the City of Osmond. This alternative would reduce the occurrence of overtopped roads, inundated buildings, and threats to community infrastructure and decrease the need for emergency personnel to assist during flood events. Temporary disruption to agricultural or residential access roads during construction may indirectly affect access to emergency services.

Reduced exposure to floodwater will prevent potential instances of sickness and injury, as well as flood-related deaths.

RECREATION

Public recreation opportunities within the watershed consists primarily of local city parks. There are no major public recreation sites within the watershed. The watershed falls within the Northeast Region of the NGPC Statewide Comprehensive Outdoor Recreation Plan (SCORP), which includes 16 counties and is the third most populous region in the state. In total, the Northeast Region contains 66,944 acres of public access recreation land and water. These recreation areas include 178 parks, 222 playgrounds, 190 ballfields, 62 soccer fields, 544 camping sites, 385 lakes/ponds, and over 81 miles of trails. Statewide, trails were voted the most important amenity to have at outdoor recreation areas. The Northeast region is home to the only free-flowing portion of the Missouri River to border Nebraska and Ashfall Fossil Beds State Historical Park (NGPC, 2020).

No Action Alternative: This impact would be indirect, minor, permanent, and adverse. There are no major public recreation sites within the watershed. Flooding may impact people's ability to travel to recreation sites due to road closures.

Levee Improvements and Diversion Channels Alternative: This impact would be indirect, minor, long-term, and beneficial. Instances of road overtopping and/or closures would be reduced, allowing easier travel to recreation areas for residents of Pierce. Flood damage within Gilman Park in Pierce would be reduced by the interior drainage improvements.

Road Raise, Berm, and Nonstructural Alternative: This impact would be indirect, minor, long-term, and beneficial. Instances of road overtopping and/or closures would be reduced, allowing easier travel to recreation areas for residents of Osmond. Flood damage to Osmond Park would be reduced by the road raise and berm.

3.07 ECOSYSTEM SERVICES

PR&G requires alternatives to be evaluated through an ecosystem services framework. Ecosystem services are the benefits (both tangible and intangible) that natural ecosystems provide to humans. An ecosystem services framework provides for an integrated approach that allows consideration and transparent evaluation of the benefits and trade-offs of potential alternatives. There are four broad categories of ecosystem services:

- **Provisioning** – benefits to people that can be extracted from nature, such as food, drinking water, timber, gas, oils, medicine, etc.
- **Regulating** – benefits provided by ecosystem processes that moderate natural phenomena, such as air quality, water quality, erosion prevention, flood control, pollination, climate regulation, etc.

- **Cultural** – non-material benefits that contribute to the development and cultural advancement of people. Cultural services make the world a place in which people want to live and address people's basic needs for a good, fulfilling life, such as aesthetics, recreation, tourism, spirituality, etc.
- **Supporting** – benefits provided by underlying natural processes, such as photosynthesis, nutrient cycling, soil formation, water cycling, etc.

Each proposed action is linked to ecosystem features and the associated provisioning, regulating, or cultural services potentially affected. Supporting services, which refer to the underlying process that maintain conditions for life, allow the other services to exist and are not evaluated.

Based on public scoping comments, planning documents, watershed plans from surrounding areas, and discussion with the project sponsor, it was determined that the primary benefits resulting from a project would be reductions in damages to buildings, loss of business incomes, and loss of wages. Based on that information, regulating ecosystem service flows were the only service selected to be monetized for the economic evaluation of this Plan-EA.

REGULATING SERVICES

Regulating services maintain a world in which it is possible for people to live and provide critical benefits that buffer against environmental catastrophes. For the scope of this analysis, these include resources that are predominantly related to flood control (water quantity, floodplain management, flood damages, wetlands, riparian areas, and public safety). Additional resources are directly or indirectly related to water filtration and disease control (water quality, wetlands, and streams). Regulating services were the only ecosystem service monetized for the economic analysis portion of this study, as shown in Figure 1.

No Action Alternative: This impact would be indirect, major, permanent, and adverse. This alternative would not regulate any flooding within the watershed. Continued flooding would lead to ongoing flood damage and concerns for public health and safety. Watershed residents would continue to be displaced during flood events, and they would continue to be stressed about damage to their homes and belongings as well as potential threats to their lives.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, major, long-term, and beneficial. This alternative would provide regulation of flooding and improvements to public health and safety in Pierce, leading to enhanced regulating services within the watershed. As previously discussed, this alternative would reduce flood damage and produce monetary annual flood damage reduction benefits for the watershed. Additionally, stress and the financial hardships caused by displacement from flooding would be alleviated for residents of Pierce with the implementation of the alternative. The alternative is designed to reduce flood damage up to and including the 100-year recurrence interval. Risk of flood damage remains during events greater in magnitude than the 100-year recurrence interval.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, major, long-term, and beneficial. This alternative would provide regulation of flooding and improvements to public health and safety in Pierce, leading to enhanced regulating services within the watershed. As previously discussed, this alternative would reduce flood damage and produce monetary annual flood damage reduction benefits for the watershed. Additionally, stress and the financial hardships caused by displacement from flooding would be alleviated for residents of Osmond with the implementation of the alternative. The alternative is designed to reduce flood damage up to and including the 100-year recurrence interval. Risk of flood damage remains during events greater in magnitude than the 100-year recurrence interval.

PROVISIONING SERVICES

The primary provisioning services provided within the North Fork Elkhorn River Watershed are the result of lands utilized for agriculture. As discussed in the Land Use section of this chapter, the watershed is dominated by agriculture, with 82% of the area utilized for cultivated cropland and 11% utilized for pasture. These areas directly contribute to provisioning services via food production. Approximately 12,950 acres of cropland and 7,780 acres of pasture fall within the regulatory floodplain. Flood impacts may harm the capacity for food production, thereby reducing provisioning services.

No Action Alternative: Impacts would be indirect, permanent, and neutral. This alternative would not change the current conditions of provisioning services when viewed as food production capacity within the watershed. No agricultural land would be added or removed, and the overall agricultural nature of the watershed would not be affected.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, negligible, permanent, and adverse. This alternative would slightly reduce provisioning services when viewed as food production capacity within the watershed. Construction of this alternative would result in the loss of 16 acres of cultivated cropland. The overall agricultural nature of the watershed would not be affected.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, negligible, permanent, and adverse. This alternative would slightly reduce provisioning services when viewed as food production capacity within the watershed. Construction of this alternative would result in the loss of 0.5 acres of cultivated cropland. The overall agricultural nature of the watershed would not be affected.

CULTURAL SERVICES

Public safety is the primary cultural service affected by flooding within the North Fork Elkhorn River Watershed. As discussed in the Human Resources section of this chapter, residents are continually stressed and threatened by flooding under the existing watershed conditions. Evacuation, damage to homes, loss of income, and potential loss of life are all major factory

caused by flooding which lessen public safety and adversely affect cultural services within the watershed.

No Action Alternative: This impact would be indirect, major, permanent, and adverse. This alternative would not benefit public safety within the watershed and therefore would not improve cultural services. Watershed residents would continue to be displaced during flood events, and they would continue to be stressed about damage to their homes and belongings as well as potential threats to their lives.

Levee Improvements and Diversion Channels Alternative: This impact would be direct, major, long-term, and beneficial. Cultural services within the watershed would be affected by improving public health and safety in Pierce. Stress and the financial hardships caused by displacement from flooding would be alleviated for residents of Pierce with the implementation of the alternative.

Road Raise, Berm, and Nonstructural Alternative: This impact would be direct, major, long-term, and beneficial. Cultural services within the watershed would be affected by improving public health and safety in Osmond. Stress and the financial hardships caused by displacement from flooding would be alleviated for residents of Osmond with the implementation of the alternative.

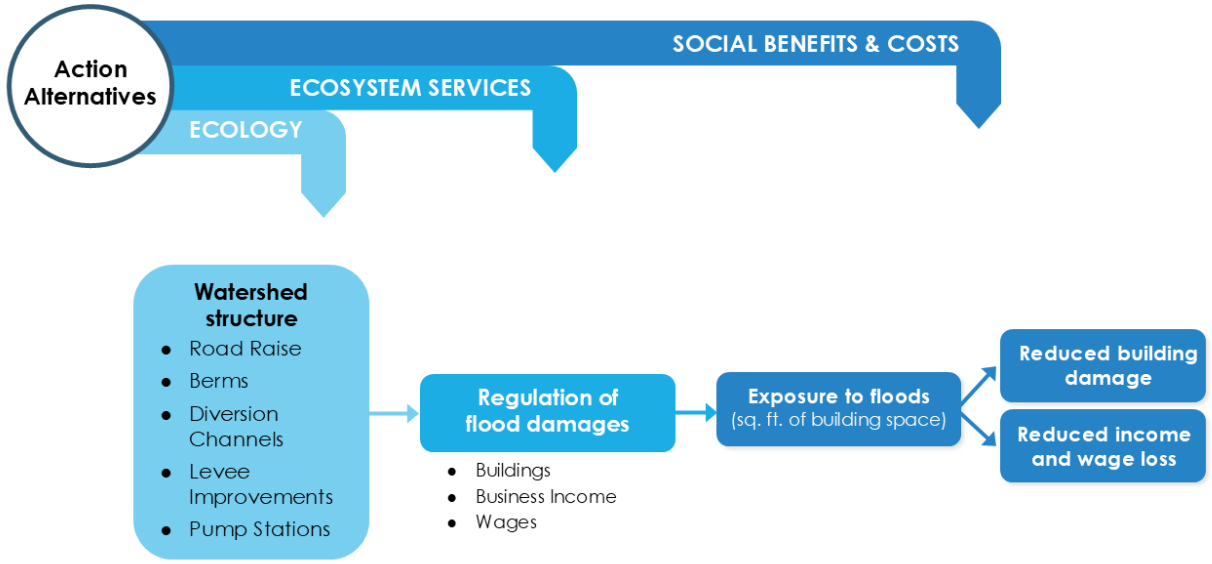

Figure 1: Ecosystem Services or Service Flows Selected for Economic Evaluation

REASONABLY FORESEEABLE FUTURE EFFECTS

The effects of climate change are expected to be present within the watershed in the foreseeable future, causing higher average temperatures, more extreme weather events, and changes in precipitation patterns. In response to climate pressures, it is reasonable to anticipate that adoption of conservation practices by agricultural producers will increase in the future. Climate change may lead to variations in normal streamflow conditions due to changes in precipitation patterns. This could also affect threatened and endangered species that rely on normal streamflow. More extreme weather events may increase the frequency of flooding within the watershed. The proposed alternative design considers variation and allows for additional freeboard, increasing the watershed's overall resiliency to climate change induced flooding events.

The watershed's population has remained steady in recent decades and will likely continue to experience slow growth. However, it is unlikely that any major conversion of land use away from agriculture will occur in the watershed in the foreseeable future. Population growth should not affect surface water, but may impact groundwater quantity in the region as residents rely on aquifers for domestic water supply. Population growth is unlikely to take place at such a rate that habitat for threatened and endangered species will be negatively impacted.

There are no known current or reasonably foreseeable projects in the watershed which would interact with this proposed project.

POSSIBLE CONFLICTS WITH PLANS AND POLICIES

A review of available regional water management plans and coordination with the Sponsor and representatives of Osmond and Pierce shows that there are no anticipated conflicts with currently available plans or policies, and that the proposed alternative is consistent with each regional water management plan.

PRECEDENT FOR FUTURE ACTIONS WITH SIGNIFICANT IMPACTS

The actions required to implement the proposed alternative do not set a precedent for future actions in the watershed that would cause significant impacts. Any other projects similar in nature and vision would be evaluated under their own standalone study.

CONTROVERSY

The watershed has experienced flooding damage repeatedly since its settlement. Property owners are aware of the intent to reduce flood risks and there were no significant concerns voiced during public meetings or community meetings held throughout the planning process that were left unaddressed. The proposed alternative is not controversial.

Environmental Concern	Levee Improvements and Diversion Channels	Road Raise, Berm, and Nonstructural Measures
Soil Resources		

Environmental Concern	Levee Improvements and Diversion Channels	Road Raise, Berm, and Nonstructural Measures
Land Use	Construction of the alternative would remove approximately 16 acres of cropland from production. This is a negligible impact on the watershed scale, and the predominately agricultural nature of land use in the area would not be affected.	Construction of the alternative would remove approximately 0.5 acres of cropland from production. This is a negligible impact on the watershed scale, and the predominately agricultural nature of land use in the area would not be affected.
Prime and Unique Farmland	Construction of the alternative would permanently convert approximately 20 acres of USDA designated prime farmland. Per consultation required by the Farmland Protection Policy Act, no further consideration for protection or evaluation is necessary.	Exempt from FPPA consideration due to the project's location in an urban development area.
Geology	This alternative would neither disturb nor enhance geological units. Geologic/geotechnical conditions that may impact the design of this alternative would be thoroughly explored during the design phase. There are no faults near the project sites.	This alternative would neither disturb nor enhance geological units. Geologic/geotechnical conditions that may impact the design of this alternative would be thoroughly explored during the design phase. There are no faults near the project sites.
Water Resources		
Waters of the United States	Construction of the alternative would permanently impact 5.615 acres of wetlands, 0.002 acres of intermittent stream, 0.074 acres of ephemeral stream, and 0.018 acres of canal due to construction activities. It is anticipated that this would be permitted under Clean Water Act Section 404 and would require mitigation via wetland creation and stream function uplift.	Construction of the alternative would permanently impact 0.011 acres of ephemeral stream due to construction activities. It is anticipated that this would be permitted under Clean Water Act Section 404 and would not require mitigation.
Streams and Water Quantity	There would be no change to surface water quantity under non-flooding conditions. There would be no depletion of flows to the Platte River.	There would be no change to surface water quantity under non-flooding conditions. There would be no depletion of flows to the Platte River.

Environmental Concern	Levee Improvements and Diversion Channels	Road Raise, Berm, and Nonstructural Measures
Wetlands	Construction would permanently impact 5.615 acres of wetlands due to construction activities. Mitigation would establish new wetland areas. The project complies with the Food Security Act and Executive Order 11990.	Construction would not impact any wetlands. The project complies with the Food Security Act and Executive Order 11990.
Surface Water Quality	The alternative would have no impact on surface water quality. No water would be detained, and pollutants would continue to move through the watershed.	The alternative would have no impact on surface water quality. No water would be detained, and pollutants would continue to move through the watershed.
Groundwater Quantity	The alternative would not provide any opportunities for groundwater recharge, nor would it contribute to any pumping or depletion of groundwater resources.	The alternative would not provide any opportunities for groundwater recharge, nor would it contribute to any pumping or depletion of groundwater resources.
Groundwater Quality	The alternative would result in small beneficial indirect improvements to groundwater quality. Construction of the alternative would remove cropland from production, reducing pollutant loading to groundwater from agricultural chemicals.	The alternative would result in small beneficial indirect improvements to groundwater quality. Construction of the alternative would remove cropland from production, reducing pollutant loading to groundwater from agricultural chemicals.
Regional Water Management Plans	The alternative would be compliant with the goals of regional water management plans as there would be no depletion of flows to the Platte River.	The alternative would be compliant with the goals of regional water management plans as there would be no depletion of flows to the Platte River.
Floodplain Management	The alternative would reduce the overall flooding area and depth up to and including the 100-year recurrence interval, reducing the flood hazard and floodplain areas. Revisions to the regulatory floodplain would need to be coordinated with FEMA.	The alternative would reduce the overall flooding area and depth up to and including the 100-year recurrence interval, reducing the flood hazard and floodplain areas. Revisions to the regulatory floodplain would need to be coordinated with FEMA.
Federally Authorized Levee System	Construction of this alternative would involve beneficially altering an existing Federally Authorized Levee. All levee alterations would follow USACE regulations and requirements and receive USACE authorization for construction.	This alternative would not impact any Federally Authorized Levee System.

Environmental Concern	Levee Improvements and Diversion Channels	Road Raise, Berm, and Nonstructural Measures
Plant and Animal Resources		
Fish and Wildlife (Including Coordination Requirements)	The alternative would not reduce flooding outside of developed areas and would not provide flood protection to fish and wildlife. The alternative complies with the Endangered Species Act, Fish and Wildlife Coordination Act, and Nongame and Endangered Species Act.	The alternative would not reduce flooding outside of developed areas and would not provide flood protection to fish and wildlife. The alternative complies with the Endangered Species Act, Fish and Wildlife Coordination Act, and Nongame and Endangered Species Act.
Threatened and Endangered Species	Conservation measures would be utilized to ensure any potential adverse impact is minimized for any identified Threatened and Endangered Species. Measures may include construction timing, biological surveys, and approved seeding plans.	Conservation measures would be utilized to ensure any potential adverse impact is minimized for any identified Threatened and Endangered Species. Measures may include construction timing, biological surveys, and approved seeding plans.
Invasive Species	Best management practices would be used during construction to minimize the potential spread or introduction of any invasive species. Practices may include using approved native seed mixes for vegetation establishment, and cleaning construction equipment before moving between sites.	Best management practices would be used during construction to minimize the potential spread or introduction of any invasive species. Practices may include using approved native seed mixes for vegetation establishment, and cleaning construction equipment before moving between sites.
Migratory Birds and Eagles	Best management practices would be used during construction to minimize the potential for adverse effects to migratory birds and eagles. Practices may include timing to avoid construction during the migration season. The project complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.	Best management practices would be used during construction to minimize the potential for adverse effects to migratory birds and eagles. Practices may include timing to avoid construction during the migration season. The project complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.
Fish and Wildlife Habitat		

Environmental Concern	Levee Improvements and Diversion Channels	Road Raise, Berm, and Nonstructural Measures
Forest Resources	Construction of this alternative would impact approximately 2.7 acres of scattered trees. These are not cohesive woodlands. No mitigation would be required.	Construction of this alternative would not impact any trees.
Riparian Areas	Construction of this alternative would impact approximately 0.05 acres of riparian areas.	This alternative would not impact any riparian areas.
Human Resources		
Flood Damages	The alternative would have a beneficial effect due to reduced flooding resulting in approximately 80 buildings being removed from the inundation area of a 100-year flood.	The alternative would have a beneficial effect due to reduced flooding resulting in approximately 15 buildings being removed from the inundation area of a 100-year flood.
Costs	The alternative would have a beneficial effect due to reduced flooding resulting in an annualized damage reduction of approximately $1,429,500.	The alternative would have a beneficial effect due to reduced flooding resulting in an annualized damage reduction of approximately $164,100.
Historic Properties and Cultural Resources	NRCS cannot make a determination of effect at this time because the entire Area of Potential Effect (APE) could not be investigated for cultural resources due to lack of access to portions of the APE. NRCS has executed a Programmatic Agreement pursuant to 36 CFR 800.14(b) with the Nebraska State Historic Preservation Office and other consulting parties to allow for phased identification and evaluation of historic properties. NRCS will conduct additional cultural resource inventories and consult on the effects of the undertaking during the design phase of the project.	NRCS cannot make a determination of effect at this time because the entire Area of Potential Effect (APE) could not be investigated for cultural resources due to lack of access to portions of the APE. NRCS has executed a Programmatic Agreement pursuant to 36 CFR 800.14(b) with the Nebraska State Historic Preservation Office and other consulting parties to allow for phased identification and evaluation of historic properties. NRCS will conduct additional cultural resource inventories and consult on the effects of the undertaking during the design phase of the project.
Local and Regional Economy	The alternative would improve the local and regional economy by reducing the frequency and severity of flooding damage.	The alternative would improve the local and regional economy by reducing the frequency and severity of flooding damage.

Environmental Concern	Levee Improvements and Diversion Channels	Road Raise, Berm, and Nonstructural Measures
Public Health and Safety	The alternative would improve public health and safety by reducing the frequency and severity of flooding damage experienced by residents of the watershed.	The alternative would improve public health and safety by reducing the frequency and severity of flooding damage experienced by residents of the watershed.
Recreation	The alternative would improve access to recreation sites by reducing flood-related issues such as road closures.	The alternative would improve access to recreation sites by reducing flood-related issues such as road closures.
Ecosystem Services		
Provisioning	This alternative would have a minor adverse effect to food production capacity by removing 16 acres of cropland from production.	This alternative would have a minor adverse effect to food production capacity by removing 0.5 acres of cropland from production.
Regulating	This alternative would produce an annualized benefit of approximately $1,429,500 in regulating services.	This alternative would produce an annualized benefit of approximately $164,100 in regulating services.
Cultural	This alternative would improve public safety by reducing the likelihood of flooding damage and its associated stressors.	This alternative would improve public safety by reducing the likelihood of flooding damage and its associated stressors.

CHAPTER 4. AGENCIES AND PERSONS CONSULTED

4.01 PUBLIC SCOPING MEETING – NOVEMBER 6, 2023

A public scoping meeting was held in Osmond, NE with residents of the watershed and members of the project team. The open house meeting format consisted of information stations manned by members of the project team who presented information about the planning process, potential alternative options, answered questions, and took comments.

4.02 PUBLIC SCOPING MEETING – NOVEMBER 8, 2023

A public scoping meeting was held in Pierce, NE with residents of the watershed and members of the project team. The open house meeting format consisted of information stations manned by members of the project team who presented information about the planning process, potential alternative options, answered questions, and took comments.

4.03 AGENCY SCOPING MEETING – NOVEMBER 28, 2023

An agency scoping meeting was held virtually with representatives from the LENRD, NRCS, USACE, US Environmental Protection Agency, NGPC, Nebraska Department of Transportation, Nebraska State Historic Preservation Office, Federal Highway Administration, Nebraska

Department of Natural Resources, and other partners. Discussion at this meeting centered on an overview of the study area watershed, purpose and need, anticipated types of alternatives, project schedule, and next steps. The agency mailing list is included in Table 6, and the Tribal mailing list is included in Section 6.09. This meeting gave attendees an overview of the WFPO program, and details about the study area and planning process and schedule. This overview was followed by a roundtable discussion in which each agency was given the opportunity to share their agency's point of interest in the watershed, any pertinent information they may have, and any concerns.

Table 6: Agency Mailing List for First Scoping Meeting

Antelope County	Nebraska Department of Transportation
BSNF Railway	Nebraska Game and Parks Commission
Bureau of Reclamation	Nebraska State Archeologist
Cedar County	Office of the Governor
City of Osmond	Pierce County
City of Pierce	US Army Corps of Engineers
City of Plainview	US Department of Agriculture
Federal Emergency Management Agency	US Environmental Protection Agency
Federal Highway Administration Nebraska Division	US Fish and Wildlife Service
History Nebraska	US Geological Survey
Knox County	Village of Foster
Lower Elkhorn Natural Resources District	Village of Magnet
National Park Service	Village of McLean
Natural Resources Conservation Service	Village of Wausa
Nebraska Department of Environment and Energy	Wayne County
Nebraska Department of Natural Resources	

4.04 PUBLIC OPEN HOUSE MEETING – JUNE 25, 2024

A public open house meeting was held in Pierce with members of the public and representatives from the project team. The open house meeting format consisted of information stations manned by members of the project team who presented information about the planning process, potential alternative options, answered questions, and took comments.

4.05 PUBLIC OPEN HOUSE MEETING – JUNE 26, 2024

A public open house meeting was held in Osmond with members of the public and representatives from the project team. The open house meeting format consisted of information stations manned by members of the project team who presented information about the planning process, potential alternative options, answered questions, and took comments.

4.06 COORDINATION WITH USACE

Regulatory Branch:

NRCS invited the USACE Regulatory Branch to be a Cooperating Agency on this Watershed Plan-EA in October 2023. USACE accepted the invitation in a letter received October 25, 2023 (see Appendix A) and assigned Identification Number 2023-01589-WEH to the Plan-EA.

A Clean Water Act review meeting was held with representatives from the project team, LENRD, NRCS, and USACE on October 30, 2024. The purpose of the meeting was to review the preliminary impacts to streams and wetlands which fall under USACE jurisdiction. Options for mitigation of those impacts were discussed, along with potential 404 permitting strategies.

Planning Branch:

NRCS and the project sponsor met with the USACE Planning Brach Section 408 review team for a pre-application meeting on February 7, 2025. NRCS described the project components and impacts to USACE Civil Works Projects in Pierce, Nebraska. USACE requested additional hydraulic and hydrological models that show the existing Pierce levee in place to aid in their evaluation of the project and its impacts. Additional models were provided to USACE on March 18, 2025.

4.07 CONSULTATION WITH USFWS AND NGPC

USFWS was invited to be a cooperating agency for this Plan-EA but chose not to accept.

USFWS and NGPC were invited to participate in the NEPA scoping meetings held in 2023.

P.L.83-566 Section 12 consultation with USFWS was initiated on December 5, 2024. No response was received.

Informal ESA Section 7 and NESCA consultation were initiated on July 11, 2025.

4.08 TRIBAL AND NHPA SECTION 106 CONSULTATION

The NRCS consulted on a government-to-government basis with Federally Recognized Tribes who have ancestral land claims in the area and will continue to consult through implementation if cultural resources are identified after NHPA Section 106 consultation is complete. The Federally Recognized Tribes consulted from the inception of the project include:

- Apache Tribe of Oklahoma
- Cheyenne and Arapaho Tribes of Oklahoma
- Northern Arapaho Tribe
- Northern Cheyenne Tribe
- Omaha Tribe of Nebraska
- Pawnee Nation of Oklahoma
- Ponca Tribe of Indians of Oklahoma
- Ponca Tribe of Nebraska
- Santee Sioux Nation of Nebraska
- Yankton Sioux Tribe

During the scoping phase of the project, NRCS sent letters to the Nebraska State Historic Preservation Office (NeSHPO) and representatives of the Tribes listed above on October 18, 2023, to inform them of the project, invite them to participate in the agency scoping meeting, and to initiate NHPA Section consultation with them on concerns related to cultural resources. NeSHPO responded that they would like to participate in the agency scoping meeting and noted that archeological resources would be a concern in the watershed. NeSHPO also noted that the Ponca Tribe had vested interest in the area.

After the cultural resources inventory was complete, NRCS sent NHPA Section 106 consultation request letters to NeSHPO and the Tribes listed above on January 29, 2025. The consultation letter presented the proposed alternatives, the historic property identification efforts, determinations of eligibility, and the determination of effect. Copies of the cultural resources inventory report, draft programmatic agreement, and maps of the APE were submitted with the consultation letter to support the determination of effect. NRCS consulted with the USACE under NHPA Section 106 in a letter dated March 17, 2025. NRCS also sent follow up emails to the Tribes listed above on March 17, 2025, correcting some information in the original consultation letter and requesting a response regarding the project. Copies of all correspondence are provided in Appendix A.

NeSHPO agreed to be a signatory on the programmatic agreement in an email received February 28, 2025, but requested additional time to evaluate the Pierce Levee. NeSHPO asked additional questions about the Pierce Levee in a letter dated April 22, 2025. NRCS provided answers to the questions on July 17, 2025. NeSHPO concurred that the undertaking will have no adverse effect on the Pierce Levee in an email received July 18, 2025. The Northern Arapaho concurred with the determination of effect in a letter dated March 12, 2025. The Pawnee Nation responded that the project should not adversely affect the cultural landscape of the Pawnee Nation in an email received May 1, 2025. NRCS invited ACHP to participate in the Programmatic Agreement in August 2025.

Representatives from the Tribes listed above were also invited to participate in the agency review meeting and to review a copy of the draft Plan-EA prior to the public review period.

CHAPTER 5. PERMITS AND OTHER ENVIRONMENTAL REVIEWS

The following laws have been identified which the proposed alternative may need to comply with:

- USACE
  - Clean Water Act, Section 404 (regulatory program): Permit will be required
  - Section 408 Program (civil works program): The sponsor will need to request permission to modify a civil works project from the Section 408 Program
- NeDNR
  - Dam Safety Review (if applicable)
  - Water Storage Permit (if applicable)
- NDEE
  - Dust Control Title 129 - Nebraska Air Quality Regulations, Chapter 15 Section 003
  - Solid Waste Management; Nebraska Title 128 and Title 132
  - National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit
- Fish and Wildlife Coordination Act PL 116-188
  - USFWS was notified of planning project per PL 83-566, Section 12
- Migratory Bird Treaty Act
- Bald and Golden Eagle Protection Act
- Endangered Species Act
  - The only concurrence being provided for the Plan-EA by USFWS is for NEPA, as it relates to identifying significant impacts.
  - Further consultation with USFWS will be initiated after the design is complete. A Biological Assessment may be required at that time.
- Nebraska Nongame and Endangered Species Conservation Act:
  - The only concurrence being provided for the Plan-EA by NGPC is for NEPA, as it relates to identifying significant impacts.
  - Further consultation with NGPC will be initiated after the design is complete. A Biological Assessment may be required at that time.
- Floodplain Management
  - Local floodplain development permits
  - CLOMR and LOMR
    - It is anticipated implementation of this alternative will result in a future revision to the regulatory floodplain based on the additional flood risk analysis detail for the watershed developed for this plan. To assure a successful map change and to support floodplain permitting for the project, based on the conceptual alternative presented in this plan it is anticipated a Conditional Letter of Map Revision (CLOMR) would be submitted prior to project construction, if the project is funded and implemented. Once the project is completed, a Letter of Map Revision

(LOMR) would be requested from FEMA to ensure updated regulatory floodplain maps are developed.

- National Historic Preservation Act
    - In accordance with 36 CFR 800.4(b)(2), NRCS will defer identification and evaluation of historic properties until the design phase. Identification procedures and further consultation with Nebraska SHPO, Federally Recognized Tribes, and other consulting parties will continue following the procedures outlined in the Programmatic Agreement executed pursuant to 36 CFR 800.14(b) (see Appendix E). If historic properties will be adversely affected, mitigation will follow the procedures outlined in the Programmatic Agreement.

5.01 MITIGATION OF POTENTIAL EFFECTS

Impacts to existing natural resources and cultural resources/historic properties due to the installation of this project were identified in Chapter 3. Any wetlands interrupted due to excavation would be plugged to prevent further drainage of the wetland. All adverse impacts were avoided and minimized to the greatest extent practicable. The remaining impacts would require mitigation. In-field surveys, paired with other existing data were utilized to determine mitigation needs. Mitigation quantities for each resource were based on input from NRCS resource specialists and USACE Regulatory requirements. Locations of mitigation actions would be identified during the design phase. Land required for mitigation would be acquired by the Sponsor for the duration of the project life. All necessary mitigation plans would be developed as part of the design phase, prior to construction.

The project would be reviewed by USACE under CWA Section 404. It is anticipated that the alternatives would be permitted under an Individual Permit and a Nationwide Permit. All impacts are necessary to build these sites to meet current NRCS design standards. This project complies with the Food Security Act by not making the wetland areas easier to farm than they currently are, nor does it convert any wetlands to farmland. This project complies with Executive Order 11990 by adequately replacing impacted wetlands with new wetlands. Additional information is included in Appendix E.

WETLAND MITIGATION

Implementation of the preferred alternative would cause permanent wetland impacts. The bulk of wetland impacts were avoided and minimized by limiting grading extents and selecting alignments to avoid known wetland areas. Construction of the Levee Improvements and Diversion Channels alternative would result in 5.615 acres of permanent wetland impacts due to excavation, fill placement, and lateral drainage. The Road Raise, Berm, and Nonstructural alternative would not impact any wetlands. All impacts would be necessary for the new structures to meet current NRCS design standards.

These impacts would be mitigated by creating new additional wetlands of the appropriate subclass onsite. Mitigation ratios are anticipated to be 4:1 for all impacted wetlands based on

information provided by USACE during the planning process. Mitigation ratios would be subject to change during the final design and permitting of this project. Additional information is provided in Appendix E.

STREAM MITIGATION

Construction of the levee improvements and diversion channels alternative would require altering a total of 0.094 acres of streams due to fill placement for levee improvements and riprap placement for channel stabilization. Stream beds and banks would be stabilized within the project area resulting in decreased erosion and downstream sedimentation. All impacts are necessary to build these sites to meet current NRCS design standards. Additional information is included in Appendix E.

The project would be reviewed by USACE under CWA Section 404. It is anticipated that this alternative would be permitted under an Individual Permit. A jurisdictional determination alongside the Nebraska Stream Condition Assessment Procedure (NeSCAP) would be completed during the design phase. Mitigation requirements are determined by USACE based on the comparison of stream conditions before and after implementation of the project. Existing and proposed stream conditions would be analyzed using NeSCAP to determine if the overall function of the stream system would be improved following project implementation. If the function of the stream is uplifted, no additional mitigation actions would be required. If the function of the stream is not improved, mitigation actions will take place on stream channels within the ARA to improve their function.

HISTORIC PROPERTY MITIGATION

Approximately 198 acres of the Area of Potential Effect have not been investigated for the presence of historic properties. Prior to construction, NRCS will need to complete field investigations and determine whether any historic properties will be adversely affected by the proposed action. NRCS has executed a Programmatic Agreement with SHPO and consulting parties to allow for phased identification of historic properties (Appendix E). NRCS will make a determination of effect following the investigation and consult with SHPO and consulting parties. Mitigation needs, if any, will be determined during consultation following the procedures outlined in the Programmatic Agreement.

CONSERVATION MEASURES

Conservation measures would be implemented to prevent, avoid, and minimize potential adverse impacts to certain threatened and endangered species, migratory birds, and invasive species. For threatened and endangered species, conservation measures include construction timing, biological surveys, and approved seeding plans. For migratory birds, conservation measures include surveys and construction timing. For invasive species, conservation measures include approved seeding plans and proper cleaning / decontamination of transported equipment.

CHAPTER 6. CERTIFYING STATEMENTS

I certify that NRCS has considered the factors mandated by NEPA; that this environmental assessment represents the NRCS's good-faith effort to prioritize documentation of the substantive issues and most important considerations required by the Act within the congressionally mandated page limits; that this prioritization reflects the subcomponent's expert judgment; and that any issues or considerations addressed briefly or left unaddressed were, in the subcomponent's judgment, comparatively not of a substantive nature.

I certify this EA represents the NRCS's good-faith effort to fulfill NEPA's requirements within the Congressional timeline; that such effort is substantially complete; that, in the NRCS's expert opinion, it has thoroughly considered the factors mandated by NEPA; and that, in my judgment, the analysis contained herein is adequate to inform and reasonably explain my finding regarding the proposed action or selected alternative.

USDA-NATURAL RESOURCES CONSERVATION SERVICE

Approved by:

_____

Robert Lawson, State Conservationist
Natural Resources Conservation Service
1121 Lincoln Mall, Room 360
Lincoln, Nebraska 68508

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7.01 ABBREVIATIONS AND ACRONYMS

ASPE	Office of the Assistant Secretary for Planning and Evaluation
BCC	Birds of Conservation Concern
CEQ	Council on Environmental Quality
CERT	Conservation and Environmental Review Tool
CWA	Clean Water Act
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
FWOFI	Future Without Federal Investment
HSG	Hydrologic Soil Groups
HUC	Hydrologic Unit Code
IPaC	Information for Planning and Consultation
LENRD	Lower Elkhorn Natural Resources District
LPRBC	Lower Platte River Basic Coalition
NCEI	National Centers for Environmental Information
NDEE	Nebraska Department of Environment and Energy
NDEQ	Nebraska Department of Environmental Quality
NEPA	National Environmental Policy Act
NESCA	Nongame and Endangered Species Conservation Act
NeSCAP	Nebraska Stream Condition Assessment Procedure
NFHL	National Flood Hazard Layer
NFIP	National Flood Insurance Program
NGPC	Nebraska Game and Parks Commission
NHD	National Hydrography Dataset
NHL	National Historic Landmarks
NHPA	National Historic Preservation Act
NISC	Nebraska Invasive Species Council
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWSR	National Wild and Scenic Rivers
Plan-EA	Watershed Plan and Environmental Assessment
PR&G	Principles, Requirements, and Guidance for Water and Land Related Resources Implementation Studies
SCORP	Statewide Comprehensive Outdoor Recreation Plan

SLO	Sponsoring Local Organization
SWIF	System-Wide Improvement Framework
T&E	Threatened and Endangered
UNL-CSD	University of Nebraska-Lincoln Conservation and Survey Division
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WFPO	Watershed and Flood Prevention Operations

CHAPTER 8. LIST OF PREPARERS

The North Fork Elkhorn River Watershed Plan-EA was prepared by an interdisciplinary team. Those individuals who made significant input to the Plan-EA are included in Table 7. Reviewers who guided development of the Plan-EA are included in Table 8. The draft Plan-EA was reviewed and concurred with by State staff specialists having responsibility for engineering, soils agronomy, range conservation, biology, cultural resources, forestry, and geology. This review was followed by a review of the document by the NRCS National Watershed management Center (NWMC). A similar review was also provided by USACE personnel.

Table 7: List of Preparers

Name	Company/ Agency	Current Title & Experience (Years)	Education	Other Pertinent Qualifications, Publications, and Professional Licenses
Adam Rupe	JEO Consulting Group, Inc. Staff	Natural Resources Specialist / Project Manager (15 years)	B.S. Fisheries & Wildlife; B.S. Environmental Studies; M.A.S. Environmental Studies	Certified Ecological Restoration Practitioner (CERP)
Andrea Gebhart	JEO Consulting Group, Inc. Staff	Planning and Engagement Department Leader (10 years)	Masters in Community and Regional Planning; Graduate Certificate in Public Management; B.S. Dietetics	AICP
Ann Nissen	JEO Consulting Group, Inc. Staff	Project Engineer (10 years)	B.S. Civil Engineering; B.S. Business Administration	PE registration (NE)
Brianna Lock	JEO Consulting Group, Inc. Staff	Community Engagement Specialist (1 year)	B.A. Journalist B.A. Spanish	
Charlie Fankhauser	JEO Consulting Group, Inc. Staff	Water Resources Engineer (1 year)	B.S. Civil Engineering	EI
Dillon Vogt	JEO Consulting Group, Inc. Staff	Natural Resources Specialist (9 years)	B.S. Water Science; Minor - Mathematics	PH (Professional Hydrologist)
Eric Marrow	JEO Consulting Group, Inc. Staff	Environmental Scientist (9 years)	B.S. Fisheries & Wildlife; Minor - Geography	

Name	Company/ Agency	Current Title & Experience (Years)	Education	Other Pertinent Qualifications, Publications, and Professional Licenses
John Callen	JEO Consulting Group, Inc. Staff	Senior Project Engineer (19 years)	B.S. Biological Systems Engineering	PE Registration (NE, IA), Certified Floodplain Manager (CFM)
Justine Cherovsky	JEO Consulting Group, Inc. Staff	Environmental Scientist (3 years)	B.S. Environmental Studies; Minor Fisheries & Wildlife	
Katie Boden	JEO Consulting Group, Inc. Staff	Environmental Scientist (4 years)	B.S. Fisheries &Wildlife; B.S. Environmental Restoration Science	AWB
Ross Lawrence	JEO Consulting Group, Inc. Staff	Project Engineer (13 years)	B.S. Agricultural Engineering	PE registration (NE, IA, ID)
Ruvarashe Tsoka	JEO Consulting Group, Inc. Staff	Associate Planner (1 year)	Masters in Community and Regional Planning Graduate Certificate in Urban Design B.A. Global Studies	
Seth Anderson	JEO Consulting Group, Inc. Staff	Environmental Junior Scientist (2 years)	B.S. Environmental Studies	
Michael Verdone	BBC Research and Consulting Staff	Economist (14 years)	Ph.D. Natural Resource Economics	
Brian Gappa	Thiele Geotech, Inc.	Drilling Manager (25 years)	B.S. Environmental Studies/Earth Science	Certified Well Driller (NE, IA)
Broc Burmeister	Thiele Geotech, Inc.	Project Geologist (11 years)	B.S. Geology	PG Registration
Collin Steimer	Thiele Geotech, Inc.	Staff Engineer (3.5 years)	B.S. Civil Engineering	EIT (Engineer In Training)
Reanna Thiele	Thiele Geotech, Inc.	Vice President /Senior Engineer (11 years)	B.S. & M.S. Civil Engineering	PE Registration (NE, IA)
Tod Bevitt	Buried Past Consulting LLC	Principal Investigator / Archeologist (28 years)	M.A. Anthropology	
Wendi Bevitt	Buried Past Consulting LLC	Historian (24 years)	B.A. History	

Table 8. List of Government Reviewers

Name	Current Title	Agency
Allen Gehring	State Conservation Engineer	USDA NRCS
Melissa Baier	Archeologist	USDA NRCS
Ritch Nelson	Wildlife Biologist	USDA NRCS
Alessandra Sealander	Geologist	USDA-NRCS
Doug Christensen	Economist	USDA NRCS
Jordan Rodriguez	Economist	USDA-NRCS
Robert Sullivan	Dam Safety Engineer	USDA NRCS
Kristen Gordon	Natural Resources Specialist	USDA NRCS
Merceidez June Fabok	Natural Resource Specialist	USDA NRCS
Nicole Zimmerman	Hydrology and Hydraulics Engineer	USDA NRCS
Tom Mountford	Watershed Project Specialist	USDA-NRCS
Kristina Amato	Nebraska Regulatory Office	USACE
Katrina Stanek	Nebraska Regulatory Office	USACE