



U.S. DEPARTMENT OF AGRICULTURE

Natural Resources Conservation Service **EAXX-005-53-029-1125142931**

August 2026

Whitewater River Watershed Plan Environmental Assessment



Photo: Ditch Number 1 at confluence with Caney Creek, looking upstream, Conservation Works Joint Venture Partner September 2023.

For More Information Contact:

Andrew Rackers
NRCS, 601 Business Loop W Ste 250, Columbia, MO 65203
andrew.rackers@usda.gov
578-876-9352

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Table of Contents

Table of Contents	ii
Proposal Information	1
General Information	1
Purpose and Need: Why do we need to act?	1
Proposed Action: What are we proposing to do?	2
Alternatives to the Proposed Action: Are there other ways to meet the purpose and need?.....	2
Alternatives Considered but Not Analyzed in Detail	3
Interdisciplinary Proposal Screening	4
Scope of Analysis	4
Agencies and Persons Consulted.....	5
Substantive Issues Considered for Analysis.....	9
Issues Considered but Dismissed from Detailed Analysis	11
Environmental Review & Consultation	12
NEPA: Consideration of Reasonably Foreseeable Impacts	12
Potentially Affected Environment	12
Environmental Impacts of Proposed Action	24
Environmental Impacts of FWOFI	29
Commitment of Federal Resources.....	32
Consideration of Pertinent Laws, Regulations, Guidance and Executive Orders.....	32
Certifying Statement for EA Page Limit and Deadline	39
References Cited	40
Finding of No Significant Impact (FONSI)	42
Documentation Informing the FONSI.....	42
Activities Approved	42
Determination of No Significant Impacts	42
Anticipated Implementation of Authorized Activities	44
Signature and Authorization Date	44



PROPOSAL INFORMATION

General Information

Proposal Name: Watershed Plan and Environmental Document – Whitewater River Watershed - Missouri

Unique Identification #: EAXX-005-53-029-1125142931

Proposal Initiation Date: 4/14/2023

Proponent Name: Little River Drainage District

Signing Authority: Responsible Official

Responsible Official: Nate Goodrich

Unit: Missouri State Office

Anticipated Implementation of Proposal: If financial assistance is available, it is anticipated that design and permitting will occur in 2027-2028 and construction will take place 2028-2032.

General Location of Proposal: The Whitewater River Watershed extends across Scott and Cape Girardeau counties in Missouri. The project site is located approximately 2.5 miles east of Randles, Missouri in the northwestern portion of Scott County, near the border with Cape Girardeau County. The Project Area is the portion of the Whitewater River Watershed around the northern 2 miles of drainage Ditch Number 1 that may be impacted by the Proposed Action. Latitude and longitude for the site is as follows: 37°09'13" N, 89°38'42" W.

Purpose and Need: Why do we need to act?

The purpose of the Proposed Action is to implement measures within the watershed to provide flood damage reduction for agricultural lands and infrastructure including areas downstream of the watershed. The measures are intended to address all three general purposes outlined in Section 1 of PL 83-566 by: (1) reducing damage from erosion, floodwater, and sediment; (2) furthering the utilization and disposal of water; and (3) furthering the conservation and proper utilization of land. The Proposed Action will benefit local farmers as well as landowners and communities within the watershed. The Proposed Action is needed to address flooding of the ditch system and its impacts on surrounding agricultural lands. Siltation of the ditches is one important factor that contributes to flooding (NRCS 2022). As mentioned previously, accumulated sediment has reduced the drainage system's capacity, diminishing its ability to reduce flooding.

This project meets the P.L. 83-566 authorized purpose of flood prevention (flood damage reduction). The Natural Resources Conservation Service (NRCS) National Watershed Program Manual defines 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.

Proposed Action: What are we proposing to do?

The Proposed Action (Alternative 4) includes the following measures to address flood damage reduction:

- Half bank armoring along the 2-mile length of Ditch Number 1
 - A 6-inch-thick rock bedding layer would be installed, followed by
 - A layer of rock riprap with a minimum thickness of 24 inches, from the bottom of the bank up to half the bank height.
- From the half bank height to the top of bank elevation, turf reinforcement mat would be installed.
- Full bank armoring would be installed at critical erosion points, including where other drainage ditches and pipes intersect with Ditch Number 1.
- Full armoring of the side channels would include installing riprap from the trench adjacent to the channel bed and up the channel bank until it reached the top of bank. Riprap and rock would be installed at the thickness described above.

Alternatives to the Proposed Action: Are there other ways to meet the purpose and need?

The alternatives described below were selected for inclusion into the Final Array of Alternatives.

Alternative 1: No Action (FWOFI)

The No Action alternative was carried forward as if no work was done. This action is required to be carried forward to serve as a baseline for comparison of the action alternatives.

Alternative 2: Full Bank Armoring with Rock Bedding and Riprap

Alternative 2 is a structural alternative that includes installation of a 6-inch-thick rock bedding layer, followed by a layer of rock riprap with a minimum thickness of 24 inches, up to the top of bank elevation.

Alternative 3: Full Bank Armoring with Riprap Only

Alternative 3 is a structural alternative that includes installation of a layer of rock riprap with a minimum thickness of 36 inches up to the top of bank elevation.

Alternative 5: Half Bank Armoring with Riprap Only

Alternative 5 is a structural alternative that includes installation of a layer of rock riprap with a minimum thickness of 36 inches from the bottom of the bank up to half the bank height. From the half bank height to the top of bank elevation, turf reinforcement mat would be installed.



Alternative 6: Buyouts

This alternative would involve floodplain conservation easement buyouts of acreage that currently floods in the 100-Yr storm event. This compromises 20,000 acres watershed for agricultural use.

Alternatives Considered but Not Analyzed in Detail

Structural: Full Bank Armoring

Full-bank armoring of all drainage ditches within the watershed was eliminated from detailed analysis, because full bank erosion was not noted in drainage ditches outside of the Project Area.

Structural: Channel Bottom Armoring

Armoring of the channel bottom was eliminated from detailed analysis, because channel bottom cutting was not noted during surveys and assessments.



INTERDISCIPLINARY PROPOSAL SCREENING

Given the nature of the proposal, the responsible official is requesting documentation to demonstrate compliance with the following legal and regulatory considerations in addition to NEPA:

☒ Endangered Species Act (ESA)

☒ National Historic Preservation Act (NHPA)

☒ Tribal Consultation (EO 13175)

☒ Clean Air Act (CAA)

☒ Clean Water Act (CWA)

☒ Pertinent Executive Orders

Special Management Areas:

☐ Coastal Zone Management Areas

☐ Conservation Easements

☐ Coral Reefs

☐ Inventoried Roadless

☐ Marine Sanctuaries

☐ National Recreation Areas

☐ National Scenic & Historic Trails

☐ Research or Experimental Areas

☐ Wild & Scenic River Corridors

☐ Wilderness

☐ Other: [specify area type](#)

Scope of Analysis

The following describes how the agency drew a reasonable and manageable line relating to its consideration of environmental effects from the proposed action (and action alternatives, if any) that extend outside the geographical territory of the proposal or might materialize later in time.

Scoping is used to identify the issues relevant to defining the problems and formulating and evaluating the alternative solutions in an environmental assessment. Significant issues will be analyzed in detail in subsequent sections of the Plan. Scoping issues that were considered, but then determined not to be significant, were eliminated from detailed study as explained below.

The Project planning team conducted scoping efforts to identify economic, environmental, cultural, and social issues of importance in the watershed and affected areas associated with the alternatives being evaluated for the Proposed Action. Resource concerns that may be affected by the Proposed Action that are not limited to the Project Area were evaluated at the watershed level. Input from Little River Drainage District (LRDD), interested agencies, and local residents

was collected and documented through correspondence and public meetings. An interdisciplinary planning team with experts in engineering, hydraulics, biology, economics, resource conservation, water quality, soils, archeology, and geology identified factors that have the potential to affect soil, water, air, plants, animals, and the human environment.

Agencies and Persons Consulted

Given the nature of the proposal, the responsible official consulted the following agencies, organizations, tribes, and persons during development and analysis of the proposal:

Native American Tribes

- Absentee-Shawnee Tribe of Indians of Oklahoma, Shawnee, Oklahoma
- Cherokee Nation, Tahlequah, Oklahoma
- Delaware Nation, Anadarko, Oklahoma
- Delaware Tribe of Indians, Emporia, Kansas
- Eastern Shawnee Tribe of Oklahoma, Wyandotte, Oklahoma (federally recognized)
- Iowa Tribe of Oklahoma, Perkins, Oklahoma
- Miami Tribe of Oklahoma, Miami, Oklahoma
- Osage Nation, Pawhuska, Oklahoma
- Peoria Tribe of Indians of Oklahoma, Miami, Oklahoma
- Ponca Tribe of Nebraska, Niobrara, Nebraska
- Ponca Tribe of Oklahoma, Ponca City, Oklahoma
- Quapaw Tribe of Oklahoma, Quapaw, Oklahoma
 - letter from Tribe documenting concurrence with NRCS finding of ‘No historic properties affected’ 9/21/2023
- Shawnee Tribe, Miami, Oklahoma
- United Keetoowah Band of Cherokee Indians in Oklahoma, Tahlequah, Oklahoma

NRCS solicited input from the Tribal governments listed above during development of the Watershed Plan (Plan). Federally recognized Tribal lands, as defined in the NHPA, do not occur in Missouri. The invitation to participate as a consulting party was requested on September 7, 2023, pursuant to requirements of Section 106 of the National Historic Preservation Act of 1966, as amended, (54 U.S.C. §300101 et. seq. per Public Law 13-287) and the Protection of Historic Properties (36 CFR Part 800). The fourteen Tribes listed above were identified as having Tribal interests in Scott and Cape Girardeau Counties (MODOT 20263). No Tribal comments were received regarding this determination and no comments indicated that the Proposed Action would have adverse effects on historic properties, which include Traditional Cultural Properties, Places of Religious and Cultural Significance, Indian Sacred Sites, or culturally sensitive resources based on the alternatives presented in this document and based on consultation with the relevant Tribal entities about these alternatives. Comments were received from the Tribes listed below (in bold) and can be found in Appendix A.

The Section 106 was initiated on September 7, 2023, and again on September 12, 2024, with a consultation package containing project information, APE, identification efforts and finding of effect. All fourteen tribes were sent Section 106 project review packages and consultation letters

which are also included in Appendix A. The Quapaw Nation was the only respondent, (September 21, 2023) stating that the project would have “no effect” to known properties of cultural or sacred significance to the Quapaw Nation and does not anticipate that the project will adversely impact any cultural resources or human remains. No Tribal comments indicated that the Proposed Action would have adverse effects on historic properties, which include Traditional Cultural Properties, Places of Religious and Cultural Significance, Indian Sacred Sites, or culturally sensitive resources based on the alternatives presented in this document and based on consultation with the relevant Tribal entities about these alternatives. Below is the list of Tribes who were identified by NRCS as having a potential interest whose name is followed by reference and are filed in Appendix A. NRCS served as the tribal liaison for the project.

Agencies

Federal Agencies. The planning team coordinated technical submissions and drafts of the Plan and associated technical documents with NRCS. Technical review comments from NRCS were incorporated into the documents. NRCS served as the Tribal liaison for the project.

Additional input was solicited from the following Federal agencies.

- U.S. Environmental Protection Agency
 - The USEPA’s letter in Appendix A provided recommendations on:
 - Water Quality – no 303(d) CWA Impaired Water Bodies in project area
 - Wetlands and Aquatic Resources - wetlands in project area, streams (ditches) are exempt from section 404 permitting, first avoid, minimize then mitigate impacts
 - Air Quality Strategies - impacts during construction will be minimized
 - Resiliency - will be addressed by improving the drainage system’s ability to withstand effects of increased storm frequency and intensity
 - Demolition Debris and Contamination – no contaminated materials will be involved in the construction process
 - Energy Efficiency – such vehicles will be used, if possible, during construction
 - Pollinators and Native Plant Species – ditch buffers will be replanted with native grass and forb species.
 - Consultation Records – will be maintained as a part of the Plan EA including correspondence from SHPO (historic and cultural resources), USACE (wetlands and streams), USFWS (federal threatened and endangered species), and MODNR (state threatened and endangered species).
- Federal Emergency Management Agency
- U.S. Fish and Wildlife Service
 - The updated Official Biological Assessment, Species List, Resource List and Technical Assistance Letter obtained from the USFWS on November 11, 2025, are in Appendix A and were described in Appendix D, Tables D6-3 to D6-6. NRCS followed up the Technical Assistance letter with a consultation request on December 8, 2025, in compliance with Pub. L. 83-566 Section 12 (16 U.S.C.

Section 1008). The USFWS responded on December 23, 2025, with concurrence of the NRCS finding of May Affect – Not Likely to Adversely Affect for T&E species in the Project Area.

- U.S. Geological Survey
- USDA Farm Service Agency
- USDA Forest Service
- USDA Rural Development

State Agencies. Input was solicited from State agencies listed below.

- Missouri Association of Soil and Water Conservation Districts
- Missouri Levee and Drainage District Association
- Missouri Department of Conservation
 - The findings of the consultation inquiry are in Appendix A and were described above in Section 4.3.4.
- Missouri State Historic Preservation Office
 - NRCS consulted with SHPO regarding the ‘no adverse effects’ finding and possible eligibility in National Register of Historic Places for Ditch #1 on 10/10/24 and received concurrence from SHPO on 10/21/24 and again on 10/23/25.
- Missouri Department of Natural Resources
 - The MODNR’s letter in Appendix A provided recommendations on
 - Karst Topography – use caution as this geology acts as direct conduits of pollution to groundwater (ground disturbance will be limited to currently disturbed land and minimized)
 - Wells – hazardous waste impacts to numerous shallow wells are possible (project will minimize use of fuels and associated vehicle fluids during construction)
 - Public Lands – no conservation areas and conservation opportunity areas were identified near the project area
 - Water Protection – Best Management Practices will be utilized during construction
 - Public Drinking Water – construction activities will take surface and groundwater resources into consideration
 - Water Bodies with Specific Designated Uses and General Uses – construction activities will take water body uses into consideration. Wetlands have been identified near the project area
 - 303(d) Impaired and 305(b) Threatened Waters – none in the project area
 - Waters with TMDL’s – 1 in the project area
 - CWA Section 401 and 404 – permits may be necessary from the USACE
 - Mitigation – requirement to follow Missouri Wetland Mitigation Method for wetlands impacts (wetlands in the project area) and requirement to follow Missouri Stream Mitigation Method for stream impacts (likely to



be exempt as work will involve maintaining previously constructed ditches)

- Land Disturbance – construction will only involve previously disturbed land
 - Hazardous Waste – no demolition will occur with the construction, all removed sediment will be spread and planted on DD12 lands
 - Air Pollution – will be minimized during construction activities and no open burning will be necessary for the project
 - Historic Preservation – ditches will be maintained in this project are of historical significance
 - Floodplain – coordinate with the state Emergency Management Agency, Floodplain Management and Mitigation Branch as necessary
 - Endangered Species – coordinate with Missouri Department of Conservation
- Missouri State Emergency Management Agency
 - Missouri State Floodplain Administrators
 - Missouri Department of Agriculture
 - Missouri Department of Transportation

Local Entities

Input was solicited from the following local agencies.

- Cape Girardeau County Commission
- Cape Girardeau County Soil and Water Conservation District
- Scott County Commission
- Scott County Soil and Water Conservation District
- City of Benton
- City of Cape Girardeau
- City of Chaffee

Input was solicited from the following governmental entities.

- Governor of Missouri
- US Congress – Senate
- US Congress – House, 8th Congressional District
- Missouri State Senate – Senate District 27
- Missouri State Representative – House District 146, 148

Individuals

- Landowners who owned property within or adjacent to the project area were invited to attend the initial public meeting at the LRDD office in Cape Girardeau, Missouri on October 24, 2023. No public comments were received during or following this meeting.



- Landowners who owned property within or adjacent to the project area were also invited to attend the second public meeting at the LRDD office in Cape Girardeau, Missouri on October 1, 2024. No comments were received during or following this meeting.
- Landowners who owned property within or adjacent to the project area were also invited to attend the final public meeting at the LRDD office in Cape Girardeau, Missouri on August 11, 2026. No comments were received during or following this meeting.

Substantive Issues Considered for Analysis

Resource Concern	Rationale
Soils	
Erosion and Sedimentation	Sedimentation from watershed uplands enters the drainage ditches as well as from ditch banks that slough and deposit additional sediment into the waterway.
Prime and Unique Farmland and Farmland of Statewide Importance	The current floodwater management leads to ditch bank erosion which headcuts into and threatens prime and unique farmland and farmland of statewide importance.
Water	
Floodplain Management	The ditches in the Project Area are in Federal Emergency Management Agency flood hazard zone A and X, within the 100-year floodplain. The system's ability to lessen the effects of flooding on adjacent farmland and communities is negatively affected by sediment accumulating in ditches.
Waters of the U.S. (Streams, Lakes, and Wetlands)	Streams (ditches) are negatively impacted by sedimentation from uplands and ditch banks. Neither wetlands nor open water features (beyond the ditches) were identified in the Project Area.
Surface Water Quantity	The Project Area is subject to excess surface water and requires ditch works of improvement to minimize flooding concerns.
Surface Water Quality	Surface water quality is affected by sedimentation in ditches from uplands and ditch banks. A downstream water quality impairment from sediment exists with a TMDL in place.
Regional Watershed Management Plans	The state Missouri Water Resources Plan includes information and strategies for the region in which the Project is located.
Groundwater and Sole Source Aquifers	Although the water table and groundwater levels are regionally stable, groundwater quality is negatively affected by excess surface water from flooding, which leads to ponding in crop fields and increased transportation of nutrients/pathogens into groundwater. Sole source aquifers were not identified in the watershed.
Air	
Air Quality (Clean Air Act)	Ditch dredging can lead to short-term negative effects on air quality.



Resource Concern	Rationale
Plants and Animals	
Fish and Wildlife Habitat and Conservation	The watershed does not contain Essential Fish Habitat. The potential for fish and wildlife habitat within the Project Area is very limited as the area is already highly disturbed by normal ditch operations.
Threatened and Endangered Species	According to the U.S. Fish and Wildlife Service's Information and Planning Consultation tool, there are species that are listed or proposed to be listed that may be present in the watershed.
Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act	The Project is within the Mississippi Flyway.
Invasive Species	Invasive species have been documented in the watershed.
Natural Areas	Missouri Department of Natural Resources (DNR) has designated Natural Areas and Conservation Opportunity Areas in or near the watershed.
Riparian Areas	Riparian areas along the ditches are minimal and highly disturbed by normal ditch operations.
Human Environment	
Socioeconomic Issues	Residents are impacted socially and economically by flood damage and disruption of access to roadways and essential services during flood events.
Recreation	The Proposed Action will result in wildlife habitat improvements that may impact hunting.
Public Health and Safety	The current infrastructure is vulnerable to failure, and poses a risk of property damage, disruption of public services, and potential loss of life. Ponding, flooding, and other drainage challenges also lead to mosquito production in the area.
Potable Water Supply	Potable water intake is through groundwater wells; county and private wells may be impacted by pollutants percolating through soil to the aquifer.
Historic and Cultural Resources	Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to account for the potential effects of proposed undertakings on historic properties. The potential for historic or cultural resources in the Project Area was evaluated. No archaeological sites or cultural materials were documented during the survey. Ditch 1 was recorded as an architectural resource and determined as eligible for the NRHP as an architectural resource, see Appendix E.
Energy	Improvements in drainage infrastructure reduces energy requirements for management of excess water.



Issues Considered but Dismissed from Detailed Analysis

Resource Concern	Rationale
Soils	
Water	
Coastal Zone Management Areas	The watershed is not located in a coastal zone management area.
Wild and Scenic Rivers	Rivers with this designation are not present in the watershed.
Air	
Plants and Animals	
Coral Reefs	Coral reefs are not present in the watershed.
Human Environment	
Scenic and Visual Resources	The Project is not near scenic or visual resources.

ENVIRONMENTAL REVIEW & CONSULTATION

The following documents compliance with the National Environmental Policy Act (NEPA) and other relevant environmental laws, executive orders, and regulations.

NEPA: Consideration of Reasonably Foreseeable Impacts

Potentially Affected Environment

General Description

Climate

The climate in southeastern Missouri is generally characterized by hot humid summers and cool wet winters. The variables of temperatures, precipitation, and snowfall can range greatly from one year to the next. In the summer, temperatures reach 90 or more degrees Fahrenheit; in the winter, temperatures typically fall as far as 20 degrees Fahrenheit. The coldest average temperatures are in January, and the warmest temperatures are in July. Southeastern Missouri's average annual total precipitation is 50 inches, which includes an average annual snowfall of 8 to 12 inches. The average growing season lasts 250 days. Major cyclonic storms occur from March to June, causing regional flooding. Short duration intense storms occur during the growing season, causing severe local flooding (MCC 2024).

Topography

The topography of the Project watershed is vast, flat floodplain dissected by drainage ditches. Two sand ridges in the watershed provide relief. The eastern side of the watershed has more topographic relief, with elevations ranging from approximately 400 to 550 feet above sea level. In the western portion, where the Project Area is located, the elevation is nearly level at 325 feet above sea level (Appendix C, Figure 2a,b).

Geology

Bedrock in the watershed is generally deeper than 200 feet (MDNR 2023). The surficial geologic composition of the watershed is alluvium comprised of clay, silt, sand, and gravel of the Quaternary System of the Holocene Series (Middendorf 2003). Surface elevations in the watershed are generally below 400 feet mean sea level. The bootheel region of Missouri has the lowest elevations in the state of Missouri and the lowest point in the state is the Little River at the state line at 230 feet msl (MDNR 2002).

The Project Area is in the Mississippi Delta Cotton and Feed Grains Region Land Resource Region, which consists of the Southern Mississippi River Alluvium Major Land Resource Area. This region begins south of where the Mississippi and Ohio rivers converge and is characterized by thick alluvial deposits along the Lower Mississippi River. (Appendix C, Figure 3a,b)

Ecoregion

EPA Ecoregions classify areas of similarity between ecosystems based upon biotic and abiotic factors. Ecoregions range from Level I, which describes the most broad-scale systems, to Level IV, which includes the finest level of detail in this classification system. Level III ecoregion

descriptions include general context about landscape features, soils, climate, and vegetation across broader regions that share similar features. Level IV descriptions include more specific information about geology, soils, topography, land use, vegetation, hydrology, climate, and wildlife that characterize the ecoregion.

The watershed is within two EPA Level III and Level IV ecoregions, as there is a notable change between the southeastern portion of the watershed compared to the northwestern portion. The southeastern area of the watershed is in the Level IV River Hills ecoregion, which is within the Interior River Valleys and Hills Level III ecoregion. The Interior River Valleys and Hills ecoregion is characterized by wide valleys with forested slopes and dissected plains derived from glacial till. The River Hills ecoregion is the transition area between the steeper, forested hills of the Ozarks and the Mississippi River flood plain. Bluffs, valley slopes, and loess hills, with river valleys containing moderately to poorly drained alluvial soils, characterize this ecoregion. These distinct features lead to much more variation in current land use than the neighboring Mississippi Alluvial Plain in which the northwestern portion of Whitewater River Watershed occurs (Chapman 2002).

The Mississippi Alluvial Plain Level III ecoregion is a broad region that begins where the Ohio and Mississippi Rivers meet and continues south along the Mississippi River to the Gulf of America. This region is mostly flat, with some topographic relief provided by river terraces and levees. The northwestern area of watershed is in the St. Francis Lowlands Level IV ecoregion, which is located within the Mississippi Alluvial Plain. The soils are derived from glacial outwash deposits. Sand deposits occurring on the surface in portions of this region make this ecoregion unique from neighboring ecoregions. Historically, this region was naturally vegetated with bottomland forests, but the flat topography has led to conversion to cropland. The current land use of the watershed within this ecoregion is nearly all in row-crop agriculture with managed drainage, which includes the Project area.

Land Use and Land Cover

Land use and land cover were estimated using the U.S. Geological Survey (USGS) National Land Cover Database (NLCD) (USGS 2019), aerial photography, and field observations. Acres and percentages from NLCD are in Appendix D, Table D2-1.

Within the watershed, the primary NLCD cover type is cultivated cropland, which comprises approximately 64 percent of the watershed. The Project meets the PL 83-566 requirement that agriculture and rural communities must account for at least 20 percent of the total project benefits (USDA 2018). Deciduous forest and hay/pasture are the second and third largest land covers in the watershed (approximately 14 and 12 percent, respectively). The watershed has been dominated by crop farming for generations and is anticipated to continue in agricultural use (Appendix C, Figure 4a,b).

The proposed Project Area includes the levee banks of Ditch Number 1 with a small buffer of land from the top of slope outward. Scattered trees and small forest stands exist along the project corridor; however, these areas are generally outside of the herbaceous riparian corridor.

Resource Concerns

Soils

The dominant soils in the region are Alfisols (suborder Udalfs), Vertisols (suborder Aquerts), Inceptisols (suborder Aquepts), and Entisols (suborder Aquents). These soil orders and suborders were generally derived under forest vegetation and are characterized by periods of prolonged saturation and poor drainage.

Most of the soils in the watershed have a silty alluvium, alluvium, or clayey alluvium parent material (Appendix C, Figure 5a). The north and west portions of the watershed mostly consist of somewhat poorly drained to poorly drained soils that experience a seasonal zone of water saturation at between 5-14 inches in the winter and spring. The southeast area of the watershed is dominated by soils, which range from moderately well drained to well drained with a seasonal zone of water saturation at 30 inches (NRCS 2024).

The Project area is dominated by Sharkey silty clay, Commerce silty clay loam, and Mhoon silt loam (NRCS 2024). Acres and percentages of soil map units, drainage class, and hydrologic soil group are included in Appendix D, Tables D3-3; Appendix C, Figure 5b. Ponding and excess water occurs without managed drainage.

Table 1. Dominant Soils in the watershed and Project Area.

Soil Type	Watershed		Project Area	
	Acres	Percent	Acres	Percent
Mhoon Silt Loam	2,868	5	3	7
Sharkey Silty Clay	12,583	23	40	82
Commerce Silty Clay Loam	894	2	5	12
Falaya Silt Loam	8,751	16	0	0
Adler Silt Loam	11,498	21	0	0
Memphis Silt Loam	17,435	31	0	0
Water, Levees, Borrow Pits	469	0	0	0
Total	54,496	100	48	100

Erosion and Sedimentation

Erosion and sedimentation of drainage ditches is occurring from bank sloughing within the channel, overland flow, and concentrated erosion from adjacent crop fields. Gully head cuts are forming where the crop fields meet the edge of the drainage ditch. Without management, gullies continue to move up into crop fields as water falls over the knickpoint. The lack of soil conservation practices on adjacent cropland, such as reduced tillage, cover cropping, riparian buffers, and rotations involving crops with higher conservation value contributes to erosion concerns. Erosion and sedimentation reduce the efficiency of the drainage system and lead to transfer of sediment downstream. The Lower Caney Basin, at the outlet of the watershed, has reduced water storage capacity and its elevation is five feet higher than when it was initially developed a century ago due to sedimentation (NRCS 2022).



Prime and Unique Farmland and Farmland Soils of Statewide Importance

NRCS classifies soil map units based on soil characteristics that are best suited to growing food, animal feed, fiber, forage, and oilseed crops. Of the 54,496 acres in the watershed, 81 percent are classified as prime farmland, prime farmland (if drained), or farmland of statewide importance. The land in the Project Area is classified as 100 percent prime farmland (if drained) (Appendix C, Figure 6a,b, Appendix D, Table D3-4).

Water

Floodplain Management

According to the 2012 Flood Insurance Rate Map, most of the watershed is mapped by the Federal Emergency Management Agency as A and X (Appendix C, Figure 7a). Flood zone A is considered a Special Flood Hazard Area subject to inundation by the 100-year flood, for which there are no base flood elevations determined. Flood zone X is an area of minimal flood hazard.

The Project Area is within flood zone A. Lower Caney Basin, immediately adjacent on the east side of the Project Area is mapped as Area with Reduced Flood Risk due to Levee. Figure 7b in Appendix C shows the flood zones for the watershed and Project Area.

Waters of the U.S. (Streams, Lakes, and Wetlands)

The watershed includes over 198 miles of Caney Creek, Hindman Creek, Little Caney Creek, and Old Channel Hubble Creek and their tributaries. Ditch Number 1 and each contributing waterways (Ditches Numbers 15, 19A, and 20 and Caney Creek) are the primary drainages in the Project Area (Appendix C, Figure 8a). These drainages connect into the larger regional drainage system that serves southeast Missouri. The Project Area includes approximately 11,600 linear feet (LF) of five ditch reaches (Appendix C, Figure 8b). See also Appendix D, Section 6.

According to the National Wetlands Inventory (NWI), the watershed contains 1,339 acres of wetlands across 814 wetland features (Appendix C, Figure 9a). The majority of wetland area within the watershed is Freshwater Forested/Shrub Wetland (40 percent) and Riverine Wetland (30 percent). Human-made ponds and lakes comprise 26 percent of the wetland area within the watershed, and freshwater emergent wetlands comprise the remaining four percent. See Appendix D, Section 6 for additional details on wetland features in the watershed.

Portions of Ditch Number 1 within the Project Area are mapped by NWI as permanently flooded, lower perennial riverine habitats with an unconsolidated bottom that was excavated by humans (Appendix C, Figure 9b). Approximately nine acres of the Project Area are mapped as wetlands. Immediately adjacent on the east side of Ditch Number 1 is a large Freshwater Forested/Shrub Wetland complex associated with Old Caney Basin. Forested wetlands are also mapped on the west bank of Ditch Number 1 at its confluence with Ditch Number 20. Freshwater emergent wetlands are mapped at the confluence of Ditch Numbers 1 and 15.

The Project Area was reviewed for the possible delineation of wetlands in September 2023 in accordance with the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Atlantic and Gulf Coastal Plain Region (Version 2.0) (USACE 2010). Wetlands were not identified within the Project Area during the field visit.



Surface Water Quantity

The Project Area is subject to excess surface water and requires management to minimize flooding concerns. Ponding and flooding are common in the Project Area, as the terrain is relatively flat, and the soils are generally poorly drained. As described above, clay layers within the soil cause slow infiltration into subsoil aquifers, which causes ponding and flooding without well-managed drainage systems (NRCS 2022).

Overall precipitation is generally adequate but not necessarily in the amounts and at the times needed for agriculture. Managed drainage is required to move excess water, and irrigation is often required to supplement rainfall for crop production to timely moisture availability. According to 2023 data from the USDA Farm Service Agency, approximately 20 and 62 percent of all acres planted to annual crops were irrigated in Cape Girardeau and Scott Counties, respectively (FSA 2023).

Surface Water Quality

Current water quality conditions of streams in the watershed were reviewed through Missouri Department of Natural Resources (MoDNR) and U.S. Environmental Protection Agency (USEPA) resources. The water quality of the streams and drainage ditches within the watershed is currently reported as either in good or unknown condition. Ditch Number 1 is not listed on Missouri's 2020 303(d) list of impaired waters. (Appendix C, Figure 10).

Although there are no waters considered to be impaired by MoDNR or EPA, the drainage ditches in the Project watershed largely lack riparian vegetation that helps to filter sediment, nutrients, and agricultural contaminants from runoff from adjacent cropland. As mentioned above, adoption of soil health practices that would improve water filtration such as cover crops, conservation crops, and reduced tillage is not widespread in the Project watershed.

Regional Watershed Management Plans

There are no regional watershed management plans developed for the Project Area. The Missouri DNR does maintain the Missouri Water Resources Plan. This state plan provides an assessment of water resources for each major region of the state, including physical setting, water use forecast, water supply, drinking water and wastewater funding options, and developing options for future water needs. The Project Area falls within the Southeastern Missouri Region and the Lower Mississippi-St. Francis Subregion (MDNR 2020).

The Missouri Resources Water Plan notes that water resources in the Southeastern Missouri Region are generally not limiting. Nearly 50 percent of all water consumption in the state occurs in this region. Currently, sources of recharge are greater than consumption. However, groundwater declines have been observed in the Mississippi Delta region in Arkansas. Demands for groundwater are expected to increase by 17 percent by 2060 in the Southeastern Missouri Region. The Missouri Water Resources Plan recommends long-term monitoring in Missouri to support ongoing water planning. Additionally, infrastructure is aging, and investment in new infrastructure will be critical to support future growth in the area (MDNR 2020).



Groundwater Quality and Sole Source Aquifers

The watershed is in the Southeastern Lowlands region of the Missouri Groundwater Provinces delineated by the Missouri DNR. The three main aquifers in this region are the Alluvial Aquifer (0-250 feet), Wilcox Aquifer (0-1,400 feet), and McNairy Aquifer (0-600 feet). The Alluvial Aquifer is the most heavily used, mostly for irrigation wells. The depth to the water table is quite shallow through the Project Area and is relatively stable even with high summer use of the Alluvial Aquifer for irrigation (MDNR 2021). Approximately 44 percent of the watershed has a depth of 12 inches or less to the water table (NRCS 2024).

There are no Sole Source Aquifers within the watershed. Cape Girardeau County and Scott County rely on multiple groundwater wells for drinking water, and residents may have private wells (Cape Girardeau County, 2024; Scott County, 2024). Most of the groundwater in the region's aquifers is potable, meaning it meets the water quality criteria for public water supply (see Potable Water section below for more information).

The Missouri DNR has records of 407 domestic wells and 9 public wells near the Project Area, most of which are high-yield and within 200 feet of the alluvium. Pumping from high-yield wells can draw water levels down and cause the water table to be lowered near the well.

The Alluvial Aquifer contains more iron and manganese than the Wilcox and McNairy Aquifers. Agricultural contaminants such as fertilizers pose a risk to groundwater quality in the project watershed due to the unconfined and moderate permeability of the aquifer (MDNR 2021). There are also 41 abandoned and other public wells located near the Project Area that pose risks of transporting pollutants to groundwater resources. The drainage ditches lack native vegetation that would help filter contaminants before they reach the water table.

Air

Air Quality

National Ambient Air Quality Standards (NAAQS) for six pollutants that cause harm to public health and the environment have been established by the U.S. Environmental Protection Agency (EPA). These monitored pollutants are carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM), sulfur dioxide (SO₂), and lead (Pb) (EPA 2024).

The Missouri DNR operates ambient air monitors and reports the data to the EPA Air Quality System database. Cape Girardeau and Scott counties are currently attaining all criteria for air quality (MDNR 2024).

Plants and Animals

Fish and Wildlife Habitat and Conservation

Though most of the habitat in the watershed has been highly altered to support agricultural use, the area still supports many species of wildlife including white-tailed deer, coyote, rabbit, gray squirrel, otter, beaver, aquatic turtles, snakes, frogs, wild turkey, mourning doves, ducks, and geese. The area acts as an important flyway for migrating birds, especially waterfowl.

The watershed also contains populations of several species of fish including largemouth bass, smallmouth bass, catfish, drum, bluegill, gar, and yellow perch within the oxbow lakes, ponds,

rivers, and bayous. The bed of Ditch Number 1 is approximately 50 feet wide and consists of clay, silt, sand, and gravel. As a human-made drainage ditch, Ditch Number 1 has limited habitat features for fish and aquatic animals. It is, however, considered warm-water habitat that supports generalist species of fish, turtles, and other aquatic organisms.

Threatened and Endangered Species

An updated official species list was obtained from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) tool on November 19, 2025, to identify federally threatened, endangered, proposed, and candidate species that may occur in the Project Area. The IPaC results included three Endangered bat species (gray and Indiana), one Proposed Endangered bat species (tri-colored), the alligator snapping turtle (Proposed Threatened), and the monarch butterfly (a Candidate species and not legally protected).

Based on review of aerial photography and field surveys, there is potential habitat for the Indiana and tricolored bats in the Project Area, but there were no areas of officially designated Critical Habitat for these or any other species in the IPaC results (Appendix A). Additionally, monarchs were observed during the field surveys where a substantial population of common milkweed occurs on the east bank of Ditch Number 1. (Appendix C, Figure 11). The full names, status, and findings of habitat surveys and considerations for the six species are in Appendix D, Table D6-3.

Through interagency scoping for the Project, the Missouri Department of Conservation (MDC) provided a Natural Heritage Review Report (NHRR) for the watershed on October 2, 2023. The NHRR did not list wildlife preserves or designated wilderness areas and contained no records of federally listed species occurring in the watershed. MDC indicated that state-listed endangered species are not known to occur in the watershed; however, state-ranked species were identified near the watershed and are listed in Appendix D, Table D6-3.

Migratory Bird Treaty Act and Bald and Golden Eagle Protection Act

Where applicable, the USFWS IPaC report identifies Birds of Conservation Concern. The updated IPaC report obtained on November 19, 2025, listed 12 species of migratory birds that may occur in the watershed. These and other species are protected under the Migratory Bird Treaty Act (MBTA). See Appendix D, Section 5 for complete list and breeding season of each species that may occur.

Bald and golden eagles are protected by the MBTA as well as by the Bald and Golden Eagle Protection Act. The IPaC report indicated that bald and/or golden eagles may occur in the watershed. Golden eagles are rare visitors to Missouri, however, and only during the nonbreeding season.

When the Project Area was visited in September 2023 for wetland delineation, a qualified biologist also conducted a field assessment for bird habitat. The biologist observed limited habitat for migratory birds within the Project Area and found no bald eagle nests or other evidence of bald eagle presence.

Natural Areas

The Missouri Natural Areas Committee, comprised of multiple agencies, identified the need to classify Missouri habitats to help understand and protect native landscapes in the late 1970s. Paul W. Nelson was an employee at the Department of Natural Resources (DNR) and was tasked with developing a resource and tool to aid in the evaluation, management, and conservation planning for Missouri's natural communities. This evaluation system (termed the "Nelson system") is widely used by multiple agencies and includes nine key types of natural communities, which are divided further into specific natural communities. Missouri has 85 distinct natural communities described by the Nelson system (MDC 2024). The nine types of natural communities include:

- 1) Forest: A large area (>10 acres) with closed canopy tree cover and shade tolerant trees, shrubs, vines, and herbaceous plants in the understory.
- 2) Woodland: A wooded area with 30 to 100 percent tree canopy cover and largely lacking small trees and shrubs in the understory. The ground flora is rich with grasses, sedges, and forbs. Periodic disturbance, predominantly fire, is critical to maintaining the open canopy and diversity of ground flora.
- 3) Savanna: A grassland with scattered trees; tree canopy is less than 30 percent. Trees may consist of large, open grown trees, groupings of trees, and sun-tolerant shrubs. The herbaceous ground flora is highly diverse, and periodic fire is critical to maintaining these systems.
- 4) Prairie: An area where perennial forbs and grasses are dominant, with few scattered shrubs and trees. Prairies are highly diverse, with over 200 species expected in high quality remnants, and 20 or more species growing in a square yard. Most of the biomass in a prairie is underground, and periodic fire is critical to maintaining these systems.
- 5) Glade: A rocky area with thin soils, dominated by drought-tolerant grasses and forbs. Glades generally occur within wooded landscapes. Rock types, including igneous, sandstone, chert, limestone, and dolomite, influence the plant communities of glades.
- 6) Cliff and talus: Cliffs are steep outcroppings of bedrock or loess and are generally found in association with streams, floodplains, or karst features. Talus are found at the base of cliffs or steep rocky slopes. Vegetation is sparse on both cliffs and talus.
- 7) Stream edge: Communities associated with streams and rivers where flooding results in deposition or erosion of sediments and substrates. The direct impact of frequent floodwater is a defining characteristic.
- 8) Wetland: An area with soil saturation caused by surface or ground water, dominated by hydrophytic plants. Water levels fluctuate seasonally. Variation in soil types, chemistry, and water sources result in different plant communities and associations. These systems are highly productive and important for flood control and migratory animals.
- 9) Cave: An opening in the earth's surface, with little to no plant life. Animals are the main organisms in these systems. Caves may be aquatic or terrestrial depending on the amount of water present.

Designated Natural Areas in Missouri are areas that represent examples of natural communities that were present prior to European settlement. Rare plants, animals, and other features are present on these areas. There are no Natural Areas within the Project Watershed. There are two Natural Areas in Cape Girardeau County north of the Project (described below); though not

hydrologically connected, these areas provide important habitat for migratory birds that may occur in the Project Area.

- 1) *Kelso Sanctuary*. Kelso Sanctuary Natural Area is 23 acres of forest with a diversity of tree species including beech and poplar and several fern species. This area is owned and managed by the Missouri Birding Society and hosts a variety of migrating songbirds in the spring (MDC 2024a).
- 2) *Vancill Hollow*. Vancill Hollow Natural Area is 300 acres, owned and managed by Missouri DNR. It is located within Trail of Tears State Park, where a half mile south of the Natural Area the Cherokee tribe was pushed across the Mississippi River from their home in the southern Appalachian Mountains to the Oklahoma territory. Vancill Hollow has species represented in the eastern Appalachian forest and supports a variety of wildlife species including migratory birds. The forest also provides habitat for several salamander species (MDC 2024b).

In addition to designated Natural Areas that are publicly accessible, MDC and conservation partners have identified priority landscapes and areas that are important for wildlife populations and ecological systems associated with those populations. MDNR calls these areas Conservation Opportunity Areas (COAs). COAs include both terrestrial and aquatic resources and may be comprised of both public and private lands (MDC 2015). There are no COAs within the Project watershed or area, but there are several adjacent to the watershed, including Cave/Karst COA #23. The Cave/Karst COA #23 is a terrestrial COA. Cave communities are categorized as either terrestrial or aquatic, but most caves provide habitat for both community types. Sinkholes created from the collapse of cave ceilings support unique suites of organisms as well. Though Cave/Karst COA #23 is outside of the project watershed, Missouri Geosciences Technical Resource Assessment Tool indicates that there are mapped sinkholes and caves that may occur in the eastern extent of the Project watershed.

Riparian Areas

Riparian areas are those areas which occur at the interface between land and water. The land within the watershed that was once a bottomland hardwood swamp has been altered and transformed into a drained landscape lacking most of the original riparian ecosystem. The ditch banks in the Project Area are currently devoid of riparian habitat.

Invasive Species

A comprehensive list of all invasive species that have the potential to occur in the watershed is difficult to compile, because there are hundreds of species, they involve multiple taxa (e.g., plants vs. aquatic animals), and the designation of “invasive” varies by source. MDC lists thirty plants, two birds, two aquatic invertebrates, one mammal, one fish, and one insect as invasive species within Missouri (MDC 2024c). Missouri Department of Agriculture (MDA) further lists some plant species as noxious weeds, which are species that pose risk of negative economic impacts to agriculture in the state (MDA n.d.).

During the September 2023 field assessment conducted by a qualified biologist, three invasive plant species were observed within the Project Area: Japanese hop (*Humulus japonicus*), sericea



lespedeza (*Lespedeza cuneata*) and johnsongrass (*Sorghum halepense*). Sericea lespedeza and johnsongrass are listed as noxious weeds by MDA.

Human Environment

Socioeconomic Issues

According to the U.S. Census Bureau (USCB) American Community Survey (ACS), completed in 2019, Scott and Cape Girardeau Counties have a combined population of 120,274. The watershed and Project Area have a significantly lower population and population density than portions of the counties in which they reside. Chaffee, the town nearest the Project Area, has a population of 1,071.

The economy of Cape Girardeau County is based primarily on office and administrative support occupations (12 percent), sales and related occupations (10 percent), management occupations (9 percent), education instruction and library occupations (8 percent) and food preparation and serving related occupations (6.7 percent). Meanwhile, the economy of Scott County is based primarily on office and administrative support occupations (12 percent), sales and related occupations (9 percent), management occupations (9 percent), production occupations (9 percent), and health diagnosing and treating practitioners and other technical occupations (6 percent) (Data USA 2021).

Although agriculture is not represented as one of the primary industries for employment, agriculture is the predominant land use in Cape Girardeau and Scott Counties and a major economic driver of the region. Over 76 percent of the land in the project watershed is devoted to agriculture (cultivated crops and pastureland), and all the land adjoining the project area is in cultivated crop production. In Cape Girardeau County, agriculture contributes \$523.5 million in household income (MDA 2021), which represents 23 percent of the total \$2.3 billion in household income (US Census Bureau 2021). In Scott County, agriculture contributes \$475.2 million in household income (MDA 2021), which represents 47.3 percent of the total \$1.0 billion in household income (US Census Bureau 2021).

Regional socioeconomic data is given in multiple tables in Appendix D (Tables D9-1 to D9-6).

Cultural Resources

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to account for the potential effects of proposed undertakings on historic properties.

A literature review for previously recorded cultural resources and an archeological and architectural survey was conducted for the Area of Potential Effects (APE) in December 2023. The APE was based on the initial scope and design of the proposed project. Through Section 106 consultation, the APE was further refined, and is defined as an approximately 3,370-linear meter (11,056 feet / 2.09 miles) section of the drainage ditch. The width of survey was 30 meters (98.4 feet) from center of the ditch, totaling 50 acres in size. It includes the construction footprint, borrow locations, and access and staging areas, as well as the areas considered for potential visual and other effects to cultural resources. Review of the historical and archival records found no known archaeological sites or historic structures within or adjacent to the APE. A pedestrian

survey was completed over the entire APE at five-meter transects. No archaeological sites or cultural materials were documented during the survey, see Appendix E).

The architectural survey recorded Ditch Number 1 through digital photographs and archival research, see Appendix E. The drainage ditch is proposed for improvements through this project and was determined by the NRCS to be eligible as an architectural resource for the National Register of Historic Places (NRHP). The construction date of the portion of the ditch is unknown but was likely between 1914 and 1920. The ditch is determined as eligible regionally and nationally due to its historic and architectural significance under the following criteria.

- Criterion A: connection to historically significant flood control and land drainage needs in the early to mid-1900s.
- Criterion B: association with Otto L. Kochtitzky, a significant person of the past in this region as the leader of the design and engineering efforts for the drainage system.
- Criterion C: architecturally designed drainage system that represents a major engineering feat and continues to function for flood control and land reclamation.

However, the eligibility does not restrict LRDD's statutory maintenance responsibilities, and proposed work has been evaluated as having 'no adverse effect' under Section 106. While it was determined that Ditch 1 is eligible for listing on the NRHP per the Criteria above, the NRCS made a finding of no adverse effect per 36 CFR 800.5(b) as the modifications are consistent with upgrades and continued improvements to the drainage ditches that do not change its historic integrity of location, association, setting, material, and feeling. NRCS completed consultation with Missouri SHPO, and the fourteen Tribes listed in 8.1.1. Missouri. The Missouri State Historic Preservation Office (SHPO) concurred with the NRCS finding of 'no adverse effect' in letters dated October 21, 2024, and October 23, 2025 (Appendix E). The Quapaw Nation provided their concurrence on 9/21/2023 (Appendix E). There was no additional response from the Quapaw Nation or the other 13 Tribes. It is recommended that no further archeological research be completed. Tribes were contacted on September 12, 2024, regarding results of the Phase 1 Cultural Resources Survey and no comments were received.

A summary of the information in the Cultural Resources Report is available in Appendix D, while the full report is provided in Appendix E.

Recreation

There are three conservation areas managed by MDC within the watershed, located ten miles or less from the Project Area:

- 1) General Watkins Conservation Area is 1,107 acres and contains a forest type normally found in the Appalachians. Sweetgum, American beech, cucumber tree, and tulip poplar can be found, as well as more common Missouri hardwoods like oaks, maple, hickories, and walnut. MDC leads various forest management activities on the site to improve forest health, enhance wildlife habitat, and maintain watershed quality. (MDC 2024d).
- 2) Tywappity Community Lake is 184 acres of mostly woodland, with a 37-acre lake. This area supports a wide variety of trees, shrubs, and plants, as well as a variety of wildlife.



The area is managed for watershed protection and to provide recreational opportunities (MDC 2024e).

- 3) Tywappity Towersite is adjacent to Tywappity Community Lake and is a 64.3-acre site that once hosted a fire tower used for the reconnaissance of wildland fires. Currently, the area offers birdwatching, hunting, and hiking (MDC 2024f).

MDC also leases an access point to the Headwaters Diversion Channel from LRDD along the northern border of the watershed, which provides public access to recreational fishing. Evidence of recreational hunting on private land was also observed when field surveys were conducted.

Public Health and Safety

Flood damage is a major concern in the Project area. Approximately 60,000 acres of land downstream of the drainage outlet of the watershed, the Lower Caney Basin, are at risk of flooding without a functional drainage system. This risk was realized in 2011, when many acres of land and the community of Morehouse was inundated with floodwaters for more than one month following a breach of the Lower Caney Basin. These floodwaters also impacted local infrastructure, including Highway 60, a major four-lane highway in the region. Highways W, 91, DD, and Y were also affected, thereby impacting the transportation of agricultural products and access to the hospital. Ponding, flooding, and other drainage challenges can create habitat for mosquito breeding, increasing the probability of exposure to mosquito-borne illnesses (Coalson et al. 2021).

Potable Water Supply

The Project Area is near the Scott County Public Water Supply District #4, but there are no intakes associated with the District located near the Project Area. As mentioned in the Groundwater Quality and Sole Source Aquifer section above, there are 407 domestic and nine public wells near the Project Area. Although most of these wells are not drinking water wells, groundwater quality for drinking water purposes may be affected by pollutants if appropriate measures are not taken.

Energy

Management of water is critical to crop production in the Project area. Gravity fed irrigation and drainage systems are used when possible to manage water, but it is not feasible to rely solely on gravity. When gravity fed systems are not sufficient, energy sources are used to pump irrigation water and move excess water from the site. Utility and transportation infrastructure, including Ameren UE, SEMO Electric, AT&T, SEMO Technologies, BPS, Texas Eastern Transmission, and several state and federal highways, are currently under potential threat to flooding events with the current conditions of the drainage system.



Environmental Impacts of Proposed Action

What are the reasonably foreseeable short- and long-term and adverse or beneficial effects of the proposed action and alternatives (if any) on the environment, to public health and safety, on economics, and to the quality of life of the American people?

Soils

Erosion and Sedimentation

In the Proposed Action, rock bedding and riprap would be installed to half the bank height, and turf matting would be installed on the top half of the bank and seeded, along with seeding of a native grass/forb mix on removed sediment of Ditch No. 1. This may provide less erosion control than Structural Alternatives 2 and 3. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Prime and Unique Farmland and Farmland of Statewide Importance

In the Proposed Action, half bank armoring with riprap and rock bedding would create erosion control, providing increased protection of farmland adjacent to and downstream of the riprapped section by reducing the potential for headcutting. Riprap could also have negative effects, however, as introduction of riprap into a system can induce sediment deposition upstream and scour downstream of the riprapped section. Sedimentation upstream could reduce drainage from adjacent farmlands increasing the duration of ponding that follows from storm events. Scour downstream of the riprapped section could increase erosion headcuts into adjacent farmland as banks fail and begin to slough into the system. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. This alternative may provide less farmland protection than Structural Alternatives 2 and 3. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Water

Floodplain Management

Following the Proposed Action, floodwaters would move more quickly through the drainage system, providing benefits to agricultural land, property, and roads by decreasing bank erosion, sedimentation in streams (ditches), and the duration of ponding in fields in the sections where riprap would be installed. Riprap could also have negative effects outside of the riprapped sections, however, as introduction of riprap into the system can induce sediment deposition upstream and scour downstream of riprapped sections. Upstream sediment deposition and downstream scour could, in turn, reduce flow through the drainage system. Bottlenecks of surface water in the drainage system can then limit the flow of groundwater from under adjacent lands, thereby limiting infiltration on those lands and increasing the duration of ponding. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.



Waters of the U.S. (Streams, Lakes, and Wetlands)

The Proposed Action would significantly improve the condition of streams (ditches), improving water quality and movement of water through the drainage system in the section where riprap would be installed. Riprap could also have negative effects, however, as introduction of riprap into the system would induce sediment deposition upstream and scour downstream of the riprapped section, leading to reduced water quality as solids and nutrients are suspended in the water column. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Surface Water Quantity

The Proposed Action would greatly increase flow through the drainage system, decreasing ponding on agricultural fields and roads where riprap is installed. Riprap could also have negative effects, however, as introduction of riprap into a system can induce sediment deposition upstream and scour downstream of riprapped sections. Upstream sediment deposition and downstream scour could, in turn, reduce flow through the drainage system. Bottlenecks of surface water in the drainage system can then limit the flow of groundwater from under adjacent lands, thereby limiting infiltration on those lands and increasing the quantity of water ponding on these lands. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Surface Water Quality (Clean Water Act)

The Proposed Action would decrease erosion and nutrient transport, thereby increasing the water quality of both runoff and floodwater as it drains through the ditch system. This alternative would reduce the amount of sediment and pesticides entering the ditch. Riprap could also have negative effects, however, as introduction of riprap into a system can induce sediment deposition upstream and scour downstream of the riprapped section, leading to reduced water quality as solids and nutrients are suspended in the water column. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Regional Water Resource Management Plans

No change to existing conditions.

Groundwater Quality and Sole Source Aquifers

The Proposed Action would greatly increase flow through the drainage system, decreasing ponding on agricultural fields and roads, which would decrease transport of nutrients and chemicals into groundwater. Riprap could also have negative effects, however, as introduction of riprap into a system can induce sediment deposition upstream and scour downstream of the riprapped section, leading to decreased flow in these sections of the ditch, which could lead to



increased nutrients in groundwater in adjacent lands as ponding increases in duration following floods. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Air

Air Quality (Clean Air Act)

The Proposed Action would create a temporary increase of pollutants from heavy equipment during installation. Afterwards, there would be an increase in air quality as native vegetation and bank stabilization reduced wind erosion of bank soils. Riprap could also have positive long-term effects on air quality, as it would lead to decreased use of heavy equipment in regular maintenance of eroding ditch banks. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Plants and Animals

Fish and Wildlife Habitat Conservation

Following the Proposed Action, riprap could negatively affect fish and wildlife habitat by disrupting the bank vegetation-water interface, which is an important element of aquatic habitat. Additionally, the absence of vegetation could result in less shading, higher water temperature, and lower dissolved oxygen for aquatic organisms. Riprap could also have positive effects, however, by reducing erosion and thus increasing water quality. Whether effects are positive or negative would depend on the habitat requirements of a given species. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Threatened and Endangered Species

Following the Proposed Action, riprap could negatively affect threatened and endangered species habitat by encroaching on vegetated portions of ditch banks and surface water. Riprap could have positive effects, however, by reducing erosion and sedimentation and thus preventing vegetated portions of ditch banks from eroding further and uprooting potential bat roost trees into ditches. Whether effects are positive or negative would depend on the habitat requirements of a given species. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act

Following the Proposed Action, riprap could negatively affect migratory bird habitat by encroaching on vegetated portions of ditch banks and surface water. Riprap could have positive effects, however, by reducing erosion and sedimentation and thus preventing vegetated portions of ditch banks from eroding into the ditches and negatively affecting surface water. Whether



effects are positive or negative would depend on the habitat requirements of a given species. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Invasive Species

With the Proposed Action, construction activities could introduce invasive species to disturbed sites, but seeding a native grass/forb mix would help to counteract establishment of invasives. The risk of invasive species spreading downstream via floodwater would be reduced. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Natural Areas

No change to existing conditions. There are no natural areas within the watershed or hydrologically connected to the Project Area that could be affected by ditch work.

Riparian Areas

With the Proposed Action, removing sediment, reshaping the ditches, and planting a native grass/forb mix would enhance the riparian environments along the affected ditch section. Riprap could negatively affect riparian areas by encroaching on vegetated portions of ditch banks and surface water. Further, causing sediment deposition upstream and scouring downstream of the riprapped section, riprap installation could degrade riparian habitat both upstream and downstream of the riprapped section. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. Riprap could, however, have positive effects on erosion and sedimentation in the section where riprap would be installed, which would prevent vegetated portions of ditch banks from further eroding into ditches and negatively affecting surface water. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Human Environment

Socioeconomic, Social, and Cultural Issues

Following the Proposed Action, residents would be less impacted socially and economically by loss of productive farmland after flood events and inability to travel due to flooded roads, as floodwaters would move more quickly through the system. Also, residents would have a reduced need to purchase flood insurance or repair flood damage to homes, allowing for reallocation of finances. Emergency medical services would respond without additional delays. Riprap could also have negative effects, however, as introduction of riprap into a system can induce sediment deposition upstream and scour downstream of the riprapped section. Upstream sediment deposition and downstream scour could, in turn, reduce flow through the drainage system and off of adjacent lands leading to increased duration of ponding on adjacent lands. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural



Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Public Health and Safety

Following the Proposed Action, standing water from flood events would have reduced pooling duration and depth in fields, ditches and on local highways, allowing for residents to safely travel to their destinations, as floodwaters would move more quickly through the system. The reduction in standing water would cause a reduction in mosquito habitat, decreasing the risk of mosquito-borne illnesses. Riprap could also have negative effects, however, as introduction of riprap into a system can induce sediment deposition upstream and scour downstream of the riprapped section. Upstream sediment deposition and downstream scour could, in turn, reduce flow through the drainage system and off of adjacent lands leading to increased duration of ponding on adjacent lands. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Potable Water Supply

Following the Proposed Action, riprap installation would allow for floodwater to move through the project area more efficiently. Decreasing the ponding of floodwater would decrease the amount of nutrients and pollutants percolating into groundwater. Riprap could also have negative effects, however, as introduction of riprap into the system would induce sediment deposition upstream and scour downstream of the riprapped section. Upstream sediment deposition and downstream scour could, in turn, reduce flow through the drainage system and off of adjacent lands leading to increased duration of ponding on adjacent lands. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Historic and Cultural Resources

With the Proposed Action, the removal of some bank material during construction could have a short-term negative impact, but riprap installation would provide long-term protection of Ditch No. 1 from further erosion. Because the NHRP eligibility described in Section 4.3.5 does not restrict LRDD's statutory maintenance responsibilities, the proposed work has been determined as having no adverse effect on historical and cultural resources. This alternative would be expected to provide an overall net benefit by ensuring the continuation of Ditch No. 1 as a functional system well into the future. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Energy

Following the Proposed Action, energy spent on ditch maintenance to reduce erosion would decrease relative to existing levels after the energy expenditure of the initial riprap installation. If sediment deposition upstream and/or scour downstream of the riprapped section were to occur as

a result of the riprap, however, LRDD would potentially need to resume regular ditch maintenance and thus revert to some level of energy expenditure for the use of heavy equipment. These negative effects would be minimized by the existing ditch geometry and the planned armor and slope stabilization riprap techniques. As noted above, the native grass buffers would be maintained using prescribed burning rather than mowing, which would reduce the use of fossil fuels and gravity fed pump systems would not be needed as often to remove floodwater from fields. The negative effects of riprap could be less than Structural Alternatives 2 and 3, because there would be less physical change to the system with the installation of less rock material.

Environmental Impacts of FWOFI

What are the negative environmental impacts or consequences to public health and safety, economics, or the quality of life of the American people if the proposed action or alternatives (if any) are not implemented?

Soils

Erosion and Sedimentation

Without federal funding, sheet, rill, and gully erosion would continue to contribute sediment from farm fields and negatively impact the drainage system. This would continue to threaten prime farmland as gully head cuts move back from the overfall from the farm field into the drainage ditch. Sedimentation caused by upland erosion also reduces the capacity of the drainage system, resulting in increased flooding that would continue to negatively affect crop production. These effects would be seen in the short term and would become increasingly challenging in the long term. Local producers would be faced with reduced crop production, resulting in an impact to the local economy, and communities would be faced with increased risk of flooding as the drainage system continues to degrade. The Sponsor would most likely continue to mitigate the risk posed by upland erosion by removing sediment from the drainage system, but this would not address the upland source of sediment and threat to Prime Farmland from concentrated erosion.

Prime and Unique Farmland and Farmland of Statewide Importance

Inaction would negatively impact farmland. Management activities within the LRDD system would continue, impacting some drainage of the Project Area. Over time, ditch banks would continue to erode back into fields and become more undercut, leading to sedimentation of the drainage system and flooding of prime farmland adjacent to ditches and downstream. After flooding events, standing water would continue to pool on prime farmland due to the degradation of drainage infrastructure.

Water

Floodplain Management

No change to existing conditions. The sponsor would continue to monitor conditions and complete preventative maintenance activities to prolong the service life of the ditches. Flooding events would continue to cause damage to agricultural land, property, and infrastructure and incrementally become worse.



Waters of the U.S. (Streams, Lakes, and Wetlands)

No change to existing conditions. Flood events would cause in-ditch erosion and sediment transport from adjacent crop fields into streams (ditches), impacting water quality. There are no lakes or wetlands in the Project Area.

Surface Water Quantity

Inaction would lead to negative impacts. Floodwater continues to pond on agricultural fields and roads due to inadequate drainage. Sedimentation may restrict flow in the ditch, creating small pools of standing water.

Surface Water Quality (Clean Water Act)

No change to existing conditions; ditches are not listed on the Missouri 2020 303(d) list of impaired waters. Continued and exacerbated erosion would impact turbidity and nutrient cycling as more soil erodes into streams (ditches). Sedimentation in ditches may create small pools of standing water. Additionally, sedimentation would pose further threats to water quality downstream of the project area.

Regional Water Resource Management Plans

No change to existing conditions.

Groundwater Quality and Sole Source Aquifers

Inaction would lead to negative impacts. Ponding floodwater could increase transport of nutrients and pollutants into groundwater, impacting water quality. No sole source aquifer exists.

Air

Air Quality (Clean Air Act)

No change to existing conditions; the counties in Project Area are not within non-attainment zones for NAAQS and are expected to remain so. There may be temporary increases in pollutants released from heavy equipment to remove sediment and reshape the ditch's walls after particularly heavy flood events. Since the no-action alternative will not protect the ditch's banks, heavy equipment would be needed more often to address erosion from flood events.

Plants and Animals

Fish and Wildlife Habitat Conservation

No change from existing condition. Habitat for fish and wildlife continues to degrade as ditch banks slough into the drainage system, impacting water quality and turbidity. Little pollinator habitat exists as banks are planted to nonnative grasses. Sedimentation may restrict flow in ditches, creating small pools of standing water and impacting water transport down the ditch. Available habitat types may shift as there is less flowing water.

Threatened and Endangered Species

No change to existing condition. Few trees remain in the Project Area, so bat roost trees that may be impacted as ditch banks slough into the ditches would be minimal.



Migratory Bird Treaty Act/Bald and Golden Eagle Protection Act

No change to existing conditions. Few trees remain in the Project Area, so trees on the bank may be impacted as the ditch banks slough into ditches would be minimal.

Invasive Species

No change to existing conditions; invasive species can recolonize areas disturbed after flooding events or be transported downstream during flood events, expanding its territory.

Natural Areas

No change to existing conditions.

Riparian Areas

No change to existing conditions. The riparian areas continue to degrade as there is no vegetation to prevent the ditch banks from eroding. Sedimentation may block the ditches, creating small pools of standing water and reducing the ditch's flow.

Human Environment

Socioeconomic, Social, and Cultural Issues

No change from current conditions. Farmland productivity continues to degrade as soil saturates, erodes, and nutrients and sediment move downstream during flood events. Farmland inundated with standing floodwater would be less productive. Income generated from crop yield would be impacted. Residents are forced to alter travel while attending medical appointments, religious activities, shopping, work, and school. Flooded roadways may increase response time for Emergency Medical Services. School buses may be unable to travel through flooded roads, forcing children to miss school and caretakers to potentially miss work to provide childcare.

Public Health and Safety

Inaction would result in negative impacts. As evidenced by the 2011 flood, flood events may impact the use of Highways 60, W, 91, DD, and Y. Residents may be forced to drive flooded roadways or postpone traveling to medical appointments, grocery stores, work, and school. The response time for emergency medical services may be impacted. School buses may not be able to travel flooded roads, causing children to miss school and caretakers forced to miss work to provide childcare. Standing water creates a mosquito habitat, increasing the risk of mosquito-borne illnesses.

Potable Water Supply

No change to existing conditions. Ponding floodwater could lead to percolation of nutrients and pollutants into groundwater, impacting the quality for drinking water that is largely drawn from wells in the area.

Historic and Cultural Resources

No change to existing conditions. Ditch No. 1 would have an adverse effect due to erosion over time and would eventually fail to serve as a functional system.



Energy

Energy requirements do not change. The sponsor continues to use mowing and heavy equipment to combat erosion and maintain the ditch's shape. Gravity fed pumps are required to remove floodwater from fields. Energy requirements may increase sporadically after large or repeated rain events.

Commitment of Federal Resources

Will the proposed action or action alternatives (if any) make an irreversible or irretrievable commitment of Federal resources?

Irreversible effects or irretrievable commitment of resources are considered permanent. The Proposed Action would have no irreversible effects on prime farmland.

Construction equipment and materials, labor, and fuel consumption during construction activities are irretrievable. The cost of this alternative is irretrievable in the short-term but the investment will be realized in the long term due to risk reduction downstream.

How will the irreversible or irretrievable commitment of Federal resources, if any, contribute to a loss of long-term productivity for the human environment?

Long-term productivity for the human environment is likely to be minor if not negligible as the impacted resources of prime farmland are small and costs of materials, labor, and fuel will be considered an investment in reduction of downstream flood risk for the foreseeable future.

Consideration of Pertinent Laws, Regulations, Guidance and Executive Orders

Endangered Species Act

The pertinent subject matter expert(s) reviewed the proposed action (and action alternatives, if any) and documented determinations for threatened, endangered, proposed and/or candidate species (TEPC) and/or critical habitat in a biological assessment. A "may affect, likely to adversely affect" determination was reached for the following species:

Table 2: May Affect, Likely to Adversely Affect Determination for TEPC Species/Critical Habitat

Species/Habitat	Status	Proposed or Designated Critical Habitat Present?	Brief Rationale (or refer to other proposal documentation)
Gray Bat (<i>Myotis grisescens</i>)	Endangered	No	Gray bats rely on caves and other underground habitat (such as bridges, tunnels, and mines) year-round. They move annually between hibernacula and summer caves. Caves are not in the vicinity of the PA; therefore, this species was removed from consideration. The Project is anticipated to have a determination of <u>no effect</u> to the gray bat.

Species/Habitat	Status	Proposed or Designated Critical Habitat Present?	Brief Rationale (or refer to other proposal documentation)
Indiana Bat (<i>Myotis sodalis</i>)	Endangered	No	Live and dead trees that offer potential bat habitat are sparse but present in and near the PA. To avoid adverse impacts, no snag or tree removal will occur during the maternity roosting season, from April 1 to November 15. If tree clearing must occur during this time, a bat survey will be conducted. The Project is anticipated to have a determination of <u>may affect, not likely to adversely affect</u> the Indiana bat.
Tri-Colored Bat (<i>Perimyotis subflavus</i>)	Proposed Endangered	No	Live and dead trees that offer potential bat habitat are sparse but present in and near the PA. To avoid potential adverse impacts, snag or tree removal should be avoided during the maternity roosting season, from April 1 to November 15. These dates may change prior to implementation depending on listing status. The tri-colored bat is currently a proposed federally listed species, and a federal listing opinion is anticipated. If it becomes listed prior to construction, consultation with USFWS would occur and avoidance measures would be followed. The Project is anticipated to have a determination of <u>may affect, not likely to adversely affect</u> the tri-colored bat.
Alligator Snapping Turtle (<i>Macrochelys temminckii</i>)	Proposed Threatened	No	Alligator snapping turtles are generally found in deeper water of large rivers but are also found in a wide variety of other habitats, including small streams, bayous, canals, swamps, lakes, reservoirs, ponds, and oxbows. They prefer structure (e.g., tree root masses, stumps, submerged trees, etc.) over open water and may select sites with a high percentage of canopy cover. Suitable habitat for this species was not observed in the PA, therefore, this species was removed from consideration. The Project is anticipated to have a determination of <u>no effect</u> to the alligator snapping turtle.
Monarch Butterfly (<i>Danaus plexippus</i>)	Proposed Threatened	No	The monarch butterfly range is within PA limits. A significant population of monarchs and common milkweed (<i>Asclepias syriaca</i>) was observed along the eastern bank of Ditch Number 1 adjacent to Old Caney Basin Conservation Area. The monarch butterfly is currently a proposed threatened species. If the monarch butterfly becomes listed prior to construction, consultation with USFWS would occur and avoidance measures would be followed. Conservation measures will include adding milkweed species into the seeding plan to increase forage available for the species. The Project is anticipated to have a determination of <u>may affect, not likely to adversely affect</u> the monarch butterfly.



National Historic Preservation Act – Section 106 Review

The pertinent subject matter expert has reviewed the proposed action (and action alternatives, if any) and made the following determination:

No historic properties affected. Section 106 Review has been completed for the project area and one National Register eligible cultural site was found.

Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended (54 U.S.C. § 306108) and its implementing regulations (36 CFR Part 800) require federal agencies to take into account the effect of undertakings on cultural resources that are listed on or are eligible for listing on the National Register of Historic Places (NRHP). Cultural resources are physical or other expressions of human activity or occupation and include archeological sites, buildings, bridges, business districts, culturally significant landscapes, isolated artifacts or features, culturally sacred places, and objects of cultural and historic significance. In order for a cultural resource to be eligible for the NRHP as a historic property, it must be associated with events significant to the broad patterns of history; associated with the lives of persons significant in the past; embody distinctive characteristics of a type, period, or method of construction, represent the work of a master, possess high artistic value, or represent a significant and distinguishable entity; and/or must yield or be likely to yield, information important to history or prehistory. If an undertaking will alter, damage, or destroy a historic property, the agency has a responsibility to avoid, minimize, or mitigate the adverse effect.

Consultation with the State Historic Preservation Office (SHPO), Federally Recognized Tribes, and other interested parties (36 CFR 800.2), is required for any federal action that may affect historic properties. The identification and analysis of cultural resources was carried out in accordance with the guidance found in the NRCS National Cultural Resources Procedures handbook and MO SHPO's Guidelines for Phase I Archaeological Surveys and Reports. The list of consulting parties and a summary of NHPA Section 106 consultation is provided in Chapter 6.

A literature review for previously recorded cultural resources and an archeological and architectural survey was conducted for the Area of Potential Effects (APE) in December 2023. The APE was based on the initial scope and design of the proposed project. Through Section 106 consultation, the APE was further refined and is defined as an approximately 3,370-linear meter (11,056 feet / 2.09 miles) section of the drainage ditch. The width of survey was 30 meters (98.4 feet) from center of the ditch, totaling 50 acres in size. It includes the construction footprint, borrow locations, and access and staging areas, as well as the areas considered for potential visual and other effects to cultural resources. Review of the historical and archival records found no known archaeological sites or historic structures within or adjacent to the APE. A pedestrian survey was completed over the entire APE at five-meter transects. No archaeological sites or cultural materials were documented during the survey, see Appendix E.

The architectural survey recorded Ditch Number 1 through digital photographs and archival research, see Appendix E. The drainage ditch is proposed for improvements through this project and was determined by the NRCS to be eligible as an architectural resource for the National Register of Historic Places (NRHP). The construction date of the portion of the ditch is unknown.

but was likely between 1914 and 1920. The ditch is determined as eligible regionally and nationally due to its historic and architectural significance under the following criteria.

- Criterion A: connection to historically significant flood control and land drainage needs in the early to mid-1900s.
- Criterion B: association with Otto L. Kochtitzky, a significant person of the past in this region as the leader of the design and engineering efforts for the drainage system.
- Criterion C: architecturally designed drainage system that represents a major engineering feat and continues to function for flood control and land reclamation.

However, the eligibility does not restrict LRDD's statutory maintenance responsibilities, and proposed work has been evaluated as having 'no adverse effect' under Section 106. While it was determined that Ditch 1 is eligible for listing on the NRHP per the Criteria above, the NRCS made a finding of no adverse effect per 36 CFR 800.5(b) as the modifications are consistent with upgrades and continued improvements to the drainage ditches that do not change its historic integrity of location, association, setting, material, and feeling. NRCS completed consultation with Missouri SHPO, and the fourteen Tribes listed in 8.1.1. Missouri. The Missouri State Historic Preservation Office (SHPO) concurred with the NRCS finding of 'no adverse effect' in letters dated October 21, 2024, and October 23, 2025 (Appendix E). The Quapaw Nation provided their concurrence on 9/21/2023 (Appendix E). There was no additional response from the Quapaw Nation or the other 13 Tribes. It is recommended that no further archeological research be completed. Tribes were contacted on September 12, 2024, regarding results of the Phase 1 Cultural Resources Survey and no comments were received.

A summary of the information in the Cultural Resources Report is available in Appendix D, while the full report is provided in Appendix E.

Consultation with Federally Recognized Tribes

Consultation with federally recognized tribes was conducted as follows:

NRCS solicited input from the Tribal governments listed below during the development of the Plan. Federally recognized Tribal lands, as defined in the NHPA, do not occur in Missouri. The invitation to participate as a consulting party was requested on September 7, 2023, pursuant to requirements of Section 106 of the National Historic Preservation Act of 1966, as amended, (54 U.S.C. §300101 et. seq. per Public Law 13-287) and the Protection of Historic Properties (36 CFR Part 800). The fourteen Tribes listed below were identified as having Tribal interests in Scott and Cape Girardeau Counties (MODOT 2023). No Tribal comments were received regarding this determination and no comments indicated that the Proposed Action would have adverse effects on historic properties, which include Traditional Cultural Properties, Places of Religious and Cultural Significance, Indian Sacred Sites, or culturally sensitive resources based on the alternatives presented in this document and based on consultation with the relevant Tribal entities about these alternatives. Comments received from the Tribes listed below (in bold) can be found in Appendix A.

The Section 106 was initiated on September 7, 2023, and again on September 12, 2024, with a consultation package containing project information, APE, identification efforts and finding of

effect. All fourteen tribes were sent Section 106 project review packages and consultation letters which are also included in Appendix A. The Quapaw Nation was the only respondent, (September 21, 2023) stating that the project would have “no effect” to known properties of cultural or sacred significance to the Quapaw Nation and does not anticipate that the project will adversely impact any cultural resources or human remains. No Tribal comments indicated that the Proposed Action would have adverse effects on historic properties, which include Traditional Cultural Properties, Places of Religious and Cultural Significance, Indian Sacred Sites, or culturally sensitive resources based on the alternatives presented in this document and based on consultation with the relevant Tribal entities about these alternatives. Below is the list of Tribes who were identified by NRCS as having a potential interest whose name is followed by reference and are filed in Appendix A. NRCS served as the tribal liaison for the project.

- Absentee-Shawnee Tribe of Indians of Oklahoma, Shawnee, Oklahoma
- Cherokee Nation, Tahlequah, Oklahoma
- Delaware Nation, Anadarko, Oklahoma
- Delaware Tribe of Indians, Emporia, Kansas
- Eastern Shawnee Tribe of Oklahoma, Wyandotte, Oklahoma (federally recognized)
- Iowa Tribe of Oklahoma, Perkins, Oklahoma
- Miami Tribe of Oklahoma, Miami, Oklahoma
- Osage Nation, Pawhuska, Oklahoma
- Peoria Tribe of Indians of Oklahoma, Miami, Oklahoma
- Ponca Tribe of Nebraska, Niobrara, Nebraska
- Ponca Tribe of Oklahoma, Ponca City, Oklahoma
- Quapaw Tribe of Oklahoma, Quapaw, Oklahoma (letter from Tribe documenting concurrence with NRCS finding of ‘No historic properties affected’ 9/21/2023)
- Shawnee Tribe, Miami, Oklahoma
- United Keetoowah Band of Cherokee Indians in Oklahoma, Tahlequah, Oklahoma

Clean Water Act

The pertinent subject matter expert has reviewed the proposed action (and action alternatives, if any) and made the following determination:

Project may affect waters but will not affect wetlands. Modifications/design criteria have been included to ensure compliance with CWA is met. All permits received and modifications/design features are clearly presented and documented in the analysis.

Any permanent impact on waters of the United States (WOTUS) may require mitigation in the form of restoration (re-establishment or rehabilitation), enhancement, or establishment of aquatic resources. The need for compensatory mitigation would be addressed during the CWA Section 404 permitting process. The proposed action will not impact wetlands but will impact streams (ditches) used for drainage. The Sponsor will request an Approved Jurisdictional Determination (AJD) from the USACE – Memphis District to determine whether the ditches are subject to jurisdiction under Section 404 of the CWA and whether the proposed activities are exempt from



regulation under Section 404(f)(1)(C). A 2020 memo between the USACE and the EPA outlines guidance for applying this exemption for maintenance of drainage ditches (USACE 2020).

Wetlands were not identified in the Project Area and will not be impacted by implementation of the preferred alternative.

Approximately two miles of streams (ditches) will be permanently impacted by implementation of preferred alternatives. The AJD will determine if the streams (ditches) are jurisdictional. It would then be necessary to determine the impact and assess whether compensatory mitigation would be required; this would likely include agency coordination to help inform this decision. If needed, the Missouri Stream Mitigation Method, or other assessment methodology would generally be applied to determine appropriate mitigation. There is an in-lieu fee mitigation provider with a service area that includes the bootheel. If mitigation is necessary, it would also be necessary to address the preference hierarchy and other requirements established in the CWA 2008 Mitigation Rule.

The project appears to meet the Section 404(f)(1)(C) exemption for maintenance of drainage ditches and therefore not be subject to permitting by the U.S. Army Corps of Engineers (USACE). However, the USACE has the final determination as to which waterbodies fall under their jurisdiction and which are subject to Section 404 permitting. Therefore, if the project does not meet Section 404(f)(1)(C) exemptions, an individual Section 404 permit may be required for the placement of dredged or fill material within the Project Area. Should an individual Section 404 permit be required, an individual Section 401 Water Quality Certification from MDNR may also be required.

The National Pollution Discharge Elimination System (NPDES) regulates the discharge of any pollutant from a point source into a water of the United States. The maintenance of the ditches will discharge sediment and other materials into streams (ditches). During the design phase, the sponsor will need to obtain an NPDES Construction General Permit. This will outline limits on what pollutants can be discharged, reporting requirements, and other provisions to ensure that the discharge does not adversely affect water quality. This permit will be obtained through the Missouri Department of Natural Resources.

Clean Air Act

The pertinent subject matter expert has reviewed the proposed action (and action alternatives, if any) and made the following determination:

The project will not result in permanent air emissions and no modifications or further coordination needs to occur to ensure compliance.

Special Management Area Considerations

The pertinent subject matter expert has reviewed the proposed action (and action alternatives, if any) and made the following determinations based on special management area presence, proximity, or lack of:

No activities are proposed within or in the vicinity of Special Management Areas.



Pertinent Executive Orders

The applicable subject matter experts have determined the proposed action (and action alternatives, if any) are in compliance with the following Executive Orders (EO), which were deemed pertinent based on the nature of the proposal:

EO 11990, Protection of Wetlands – avoid actions within wetlands unless there are no practical alternatives, and the action includes all practicable means to minimize harm to wetlands.

The project would not impact wetlands. Project activities would occur within existing drainage ditches and associated banks that have been constructed, operated, and maintained for agricultural drainage purposes.

EO 13007, Indian Sacred Sites – avoid adversely affecting the physical integrity of these sites.

Consultation with Federally Recognized Tribes was completed as described above. No Indian Sacred Sites were identified.

EO 13112, Invasive Species – prevent the introduction of invasive species and provide for their control and to minimize the economic, ecological, and human health impacts that invasive species cause.

Best management activities for reducing risk of invasive species transport and establishment include using fill material that is guaranteed to be free from invasive species, all imported material sources locally, not importing topsoil, and cleaning equipment prior to its use within the PA.

EO 13186, Migratory Birds – identify actions that may have a measurable negative effect on migratory bird populations.

There would be no tree clearing from May 1 to July 15, or a nesting survey will be required. Eagle surveys would be conducted within a half mile of each project site prior to construction.



CERTIFYING STATEMENT FOR EA PAGE LIMIT AND DEADLINE

The Responsible Official certifies that this EA:

- ☐ Demonstrates the agency has thoroughly considered the factors mandated by NEPA;
- ☐ Represents the agency's good-faith effort to prioritize documentation of the substantive issues and most important considerations required by NEPA within the congressionally mandated page limits;
- ☐ Reflects the agency's expert judgment.
- ☐ Addressed briefly, or left unaddressed, any issues or considerations that were, in the agency's judgment, comparatively not of a substantive nature;
- ☐ Represents the agency's good-faith effort to fulfill NEPA's requirements within the Congressional timeline (or within the minimally extended timeline) and this effort is substantially complete; and
- ☐ Contains analysis that is adequate to inform and reasonably explain the responsible official's final decision regarding the proposed action or selected alternative.

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FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Proposal Name: Watershed Plan and Environmental Document – Whitewater River Watershed - Missouri
Unique Identification #: EAXX-005-53-029-1125142931

Agency Name: Natural Resources Conservation Service **Unit Name:** Missouri State Office

Documentation Informing the FONSI

This Finding of No Significant Impact incorporates the Environmental Assessment and relies on documentation in the associated proposal record.

Activities Approved

I have decided to approve the “[Proposed Action](#)” as described in the “[Proposal Information](#)” section of the Environmental Assessment.

Determination of No Significant Impacts

I have determined no significant impacts are anticipated for the activities approved based on the discussion provided under the “[NEPA: Consideration of Reasonably Foreseeable Impacts](#)” section, and as informed by other analysis and determinations provided in the “[Environmental Review and Consultation](#)” section of the Environmental Assessment.

The EA evaluated both the beneficial and adverse impacts of the proposed action, which is the authorization of funds to administer a watershed protection program offering technical and financial assistance to address flooding and flood damage. Water from adjacent farmland has been transporting sediment to the drainage ditches for around a century. The sediments have accumulated over time and have reduced the drainage system’s capacity and ability to prevent flooding.

As the drainage system have aged and sediment has built up they have become less effective at preventing floods, the flooding events themselves continue to degrade the system, contributing to failures of ditch bank slopes. The drainage ditches overflow and flood adjacent cropland, resulting in harvest interruptions, prevented plant acres, and loss of farm income. Given the importance of agricultural crop production to the region’s economy and the increasing intensity of storms due, measures are needed to improve ditch infrastructure and protection of farming operations.

As summarized in “NEPA: Consideration of Reasonably Foreseeable Impacts” section, the proposed action’s environmental benefits would outweigh the potential environmental costs of the program, which would be temporary and occur primarily during construction of individual treatment projects. Impacts to cultural and socio-economic resources would be primarily positive and minimized by project-specific systems to reduce impacts. Long-term impacts of the projects over the project life would outweigh the short-term, adverse impacts of construction. Overall, the program is estimated to result in long-term beneficial impacts to water quality, and other ecosystem services; and reduce flooding and negative stormwater impacts.



A cultural resources inventory of the area of potential effects (APE) was undertaken. During this survey Ditch 1 was found to be eligible for inclusion in the Registry of Historic Places. However, the eligibility does not restrict LRDD's statutory maintenance responsibilities, and proposed work has been evaluated as having 'no adverse effect' under Section 106. While it was determined that Ditch 1 is eligible for listing on the NRHP per the Criteria above, the NRCS made a finding of no adverse effect per 36 CFR 800.5(b) as the modifications are consistent with upgrades and continued improvements to the drainage ditches that do not change its historic integrity of location, association, setting, material, and feeling. NRCS completed consultation with Missouri SHPO, and the fourteen Tribes listed in 8.1.1. Missouri. The Missouri State Historic Preservation Office (SHPO) concurred with the NRCS finding of 'no adverse effect' in letters dated October 21, 2024, and October 23, 2025 (Appendix E). The Quapaw Nation provided their concurrence on 9/21/2023 (Appendix E). There was no additional response from the Quapaw Nation or the other 13 Tribes.

The recommended action is not anticipated to have adverse long-term effects on fish and wildlife habitat, floodplains, migratory birds, park lands, prime farmlands, rare, threatened, and endangered species of plants and animals, scenic beauty, wild and scenic rivers, or ecologically critical areas.

No threatened or endangered species in the watershed will be affected by the project.

The effects of the recommended action are not considered highly uncertain nor involve unique or unknown risks.

The project is not of National Significance and implementing the proposed alternative will not establish a precedent for future actions with significant effects, nor does it represent a decision in principle about future considerations.

The proposed action will not violate Federal, State, or local law requirements imposed for protection of the environment. Consultations required by the Magnuson-Stevens Fishery Conservation and Management Act, Endangered Species Act, National Historic Preservation Act, and Marine Mammal Protection Act have been completed. The recommended action is consistent with the requirements of these laws. The local sponsors will obtain any necessary permits before they begin implementation of the project.

The recommended action will not result in significant adverse cumulative impacts. The cumulative effects of this project are very positive for protection of downstream loss of life and property. The planned action is the most practical, complete, and acceptable means of protecting life and property of downstream residents. There are no significant negative short-term or long-term environmental or human impacts associated with the implementation of this action.

The action alternative would require construction equipment and materials and other energy in the form of labor and fossil fuels. Using these items would be generally irretrievable. The expenditure of financial resources is irretrievable in the short term, but the investment could be retrieved over the life of the projects by increasing the value of ecological resources and a reduction in flooding and stormwater damages.



Anticipated Implementation of Authorized Activities

I intend to implement the approved activities starting 1 year from authorization, depending on funding availability. Following authorization, design and construction phase funding will be requested. The implementation is expected to take 3-10 years.

Signature and Authorization Date

Nate Goodrich

**NATHAN
GOODRICH**

Digitally signed by
NATHAN GOODRICH
Date: 2026.09.29
13:14:10 -05'00'

Missouri State Conservationist

Date