FINAL DETAILED PROJECT REPORT AND ENVIRONMENTAL ASSESSMENT

Continuing Authorities Program Section 14 Emergency Streambank Protection

For

Mortar Creek

Quitman, Faulkner County, Arkansas

July 2024

P2: 470593

US Army Corps of Engineers®
Little Rock District

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DEPARTMENT OF THE ARMY
LITTLE ROCK DISTRICT, CORPS OF ENGINEERS
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MORTAR CREEK

QUITMAN, FAULKNER COUNTY, ARKANSAS

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LIST OF ACRONYMS

A	Area
ADEE	Arkansas Department of Energy and Environment
ADEQ	Arkansas Department of Environmental Quality
AEP	Annual Exceedance Probability
AMASDA	Automated Management of Archeological Sites Data in Arkansas
AR	Arkansas
ARA	Abbreviated Risk Analysis
CAP	Continuing Authorities Program
CEQ	Council on Environmental Quality
CFR	Code Of Federal Regulations
cfs	Cubic feet per second
CO	Carbon Monoxide
CWA	Clean Water Act
dBA	decibels
DNL	Day Night Level
DPR	Detailed Project Report
DPR/EA	Detailed Project Report and Environmental Assessment
EA	Environmental Assessment
EO	Executive Order
EP	Engineering Pamphlet
EPA	United States Environmental Protection Agency
ER	Engineering Regulation
FPPA	Farmland Protection Policy Act
FY	Fiscal Year
H	Horizontal
HHS	Department of Health and Human Services
HTRW	Hazardous, Toxic, Radioactive Waste
IPaC	Information for Planning and Consultation

LERRD	
M	Million
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFS	Non-Federal Sponsor
NOAA	
NRCS	Natural Resources Conservation Service
O3	Ozone
OMRRR	Operations, Maintenance, Repair, Rehabilitation and Replacement
ORV	Off-Road Recreational Vehicle
Pb	Lead
PDT	Project Delivery Team
PED	Preconstruction, Engineering and Design
PPA	Project Partnership Agreement
PM2.5	Particulate matter less than 2.5 microns
PM10	Particulate matter less than 10 microns
Q	Flow
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SHPO	State Historic Preservation Officer
SIOH	Supervision, Inspection and Overhead
SO2	Silicon Dioxide
SSURGO	Soil Survey Geographic Database
THPO	Tribal Historic Preservation Officer
USACE	United States Army Corps of Engineers
U.S.C.	United States Code
USCB	United States Census Bureau
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
V	Velocity/Vertical

1 GENERAL INFORMATION

This final Detailed Project Report and Environmental Assessment (DPR/EA) contains information relevant for both a Planning and Design Analysis used as a planning document by the U.S. Army Corps of Engineers (USACE) and an EA to satisfy the National Environmental Policy Act (NEPA).

Faulkner County (County), Arkansas (AR) is the Non-Federal Sponsor.

1.1 Study Authority

The study Authority for this report is contained in Section 14 of the Flood Control Act of 1946 (33 Code of Federal Regulations [CFR] § 263.25), as amended by Section 27 of the Water Resources Development Act approved March 7, 1974. Section 14 projects are part of a larger Continuing Authorities Program (CAP) under which the Secretary of the Army, acting through the Chief of Engineers, is authorized to plan, design, and implement certain types of water resources projects without additional project-specific authorization. The Section 14 authority allows the USACE to construct bank protection works to protect endangered highways, highway bridge approaches, and other essential, important public works, such as municipal water supply systems and sewage disposal plants, churches, hospitals, schools, and non-profit public services and known cultural sites that are endangered by flood-caused bank or shoreline erosion. Privately owned property and facilities are not eligible for protection under this authority.

1.2 Study Sponsor

The Non-Federal Sponsor for this study is Faulkner County, Arkansas

1.3 Study Area

Mortar Creek lies south-southeast of Quitman, Arkansas and runs east of Highway 107 in the Turkey Creek East Fork Cadron Creek watershed (Figure 1 and Figure 2). Quitman, AR is located in central Faulkner County, which is in the central portion of the state (Figure 1). Quitman is approximately 30 miles northeast of Conway, Arkansas and about 60 miles north of Little Rock, Arkansas. According to the US Census Bureau[1], the population of Faulkner County is approximately 128,000. The area of Faulkner County is 647 square miles (mi²) with a population density of 191 people per mi². Approximately 13.6 percent live in poverty. Faulkner County has a minority population (all races) of approximately 17 percent. The study area for impacts as well as the project area are shown in the upper left in Figure 1.

[1] https://www.census.gov/quickfacts/fact/table/faulknercountyarkansas,US/PST045222

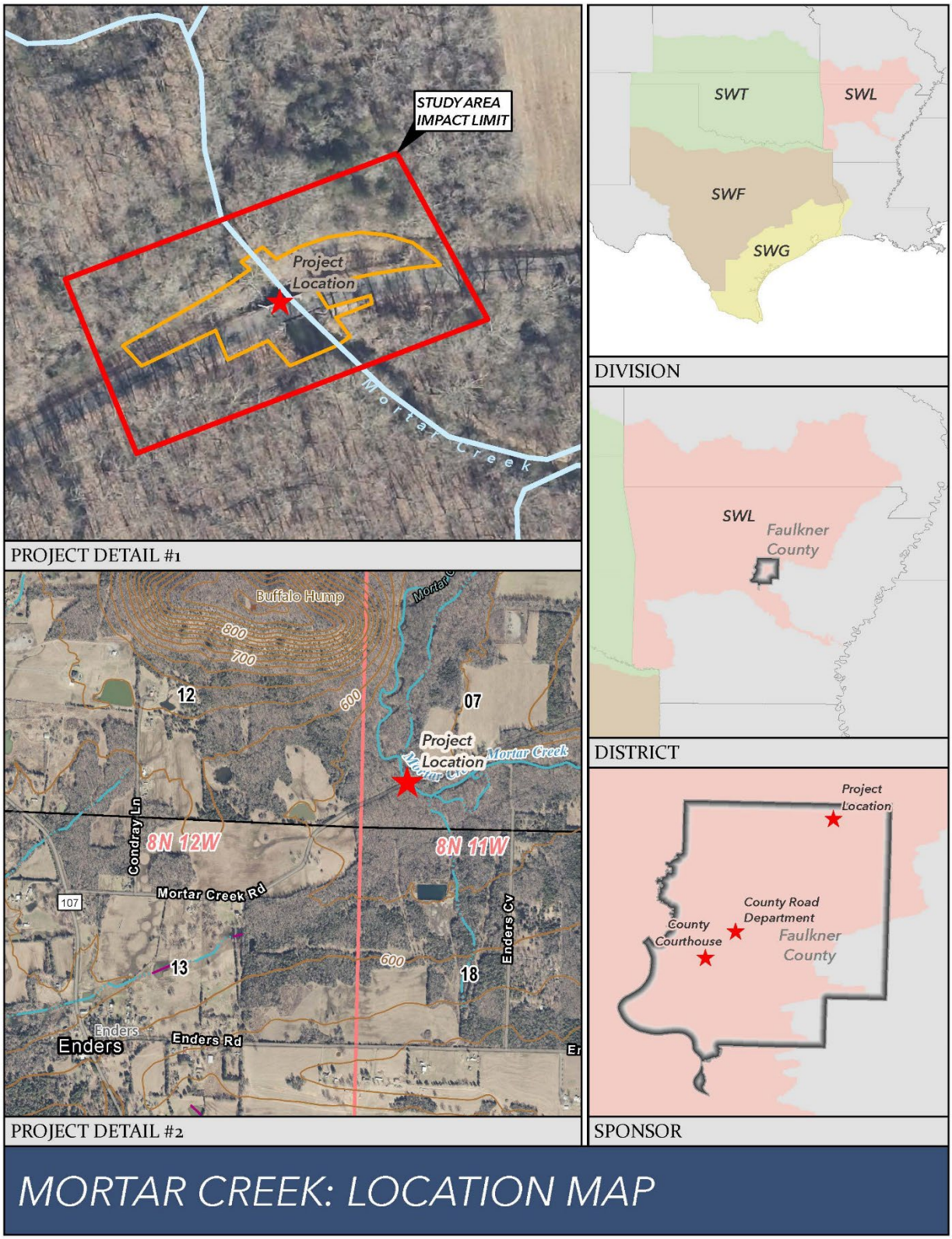

Figure 1. Project Location Map

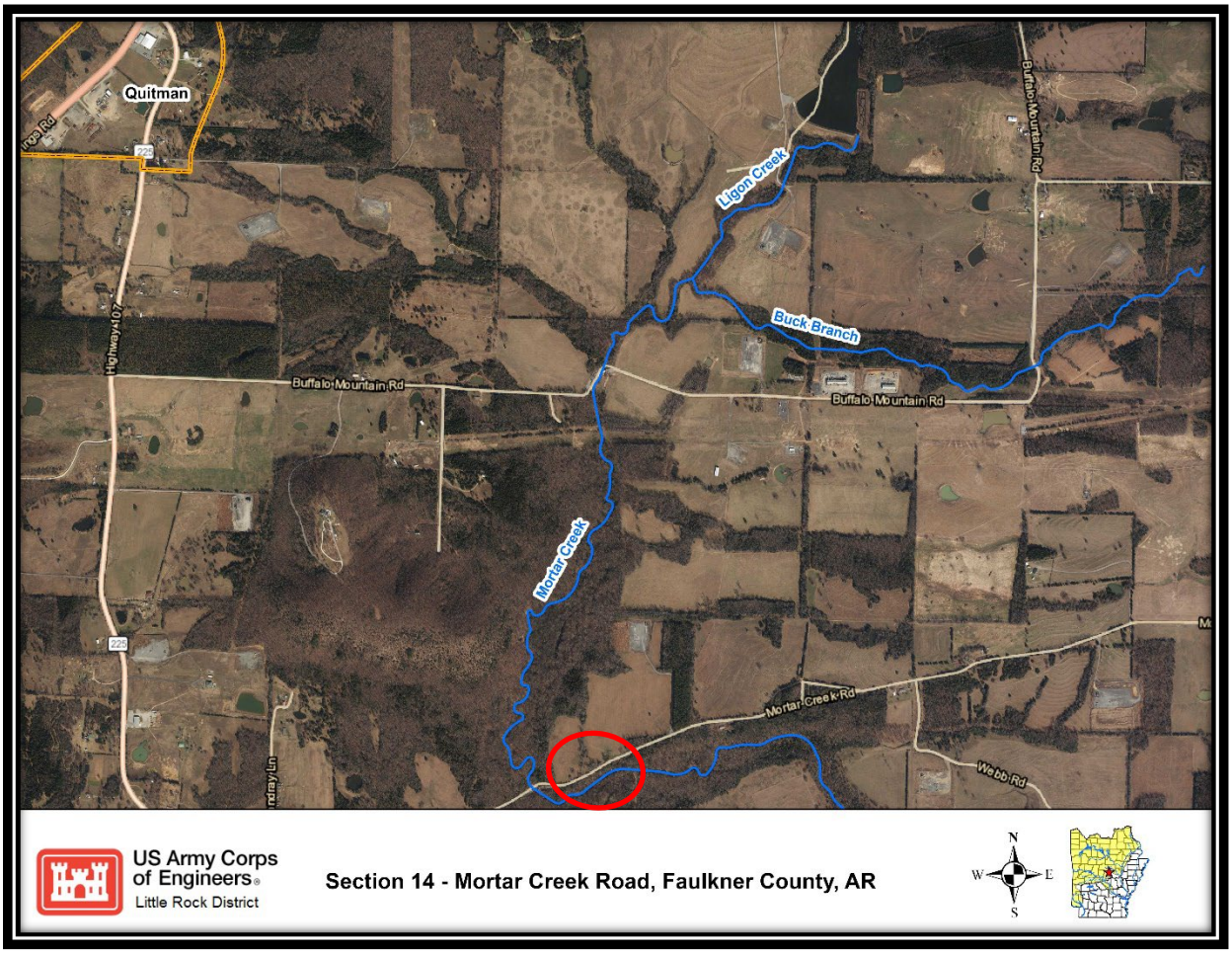

Figure 2. Mortar Creek Crossing at Mortar Creek Road, Quitman, AR

1.4 Affected Facility And Infrastructure

The bridge on Mortar Creek Road is the only infrastructure in the project area. Mortar Creek Road is the main road into and out of the area east of the Mortar Creek crossing with any alternative route adding approximately 10 miles to the destination. The traffic along the alternative route would also increase leading to a further increase in transportation costs and emergency response times along roads which are likely not intended to support the higher volume of traffic. (Figure 3).

Figure 3. Bridge over Mortar Creek at Mortar Creek Road, Quitman, AR

1.5 Study Purpose and Need

The primary purpose of the Mortar Creek Emergency Streambank Protection study is to develop a plan to protect the bridge over Mortar Creek at Mortar Creek Road southeast of Quitman in Faulkner County, AR from encroaching erosion. This includes assessing opportunities, evaluating alternatives based on the planning objectives and criteria discussed in Sections 4.3 and 4.9 below, and selecting a plan from those alternatives. The selected plan must be technically sound, environmentally acceptable, economically feasible, and supported by the County and the Federal Government.

Central Arkansas, which includes Faulkner County, has experienced widespread substantial flooding in recent years. Faulkner County has experienced three federally declared flooding disasters since 2014. As a result, several rural county road crossings in Faulkner County have sustained substantial erosion and the integrity of their structures is threatened. The Mortar Creek crossing at Mortar Creek Road is experiencing these problems as the creek is attempting to cut through the road at the crossing and reconnect at a different location on the downstream side. If this occurs, the bridge will be cutoff from the road and drivers will not be able to cross the bridge. The road is heavily traveled by residents and farmers in the area. The NFS currently

maintains Mortar Creek Road and the bridge.

The risk of the crossing at Mortar Creek Road due to severe streambank erosion has demonstrated a need to investigate the opportunities and alternatives. Site visits were conducted on 20 Feb 2023, 20 Mar 2023, 07 Apr 2023, and 05 May 2023. As shown in Figure 3, both upstream abutments are experiencing considerable erosion due to the presence of the former bridge footings and how they cause significant turbulence during higher flows. As seen from the figure, the flow can easily overtop the wingwalls and cause significant erosion of the bank material.

There is evidence that the major contributor to erosion on both the east and west upstream bridge abutments is the natural stream alignment. There is a west branch of Mortar Creek that is running parallel to the road. The east abutment is also being affected by natural streamflow (see Figure 4 below). Additionally, removing the old abutments would provide ancillary environmental benefits that would help with our sustainability policy and mission to seek balance and synergy between natural systems and human development.

The natural stream alignment is causing the erosion behind the west wingwall. The old bridge abutments are upstream of both the existing east and west abutment, but the west abutment is worse than the east. This is because there is a west branch of Mortar creek that is running parallel to the road toward the existing bridge (See pink alignment, Figure 5). This flow directly attacks the outside of the west wingwall. It swirls around and scours it out before going around the wing wall through the bridge opening.

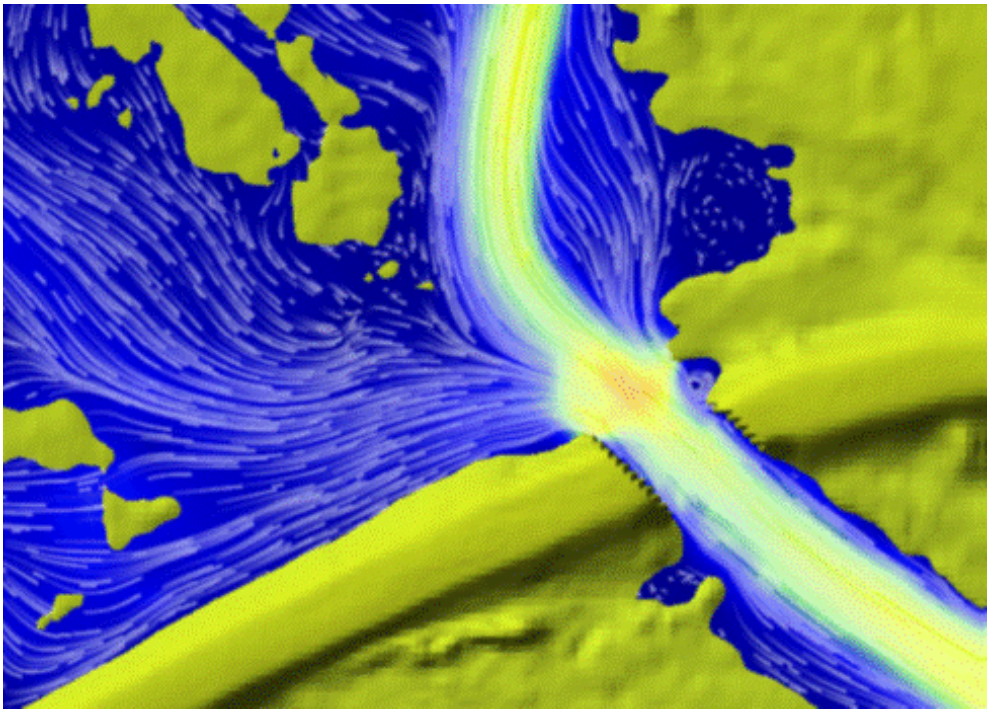

Figure 4. 2-year Flood Event of Mortar Creek at Mortar Creek Road Showing Flow Attacking Backside of West Wingwall and Eddying on the East Bridge Abutment

During this higher flows, the old bridge abutments are submerged, and their effects are proportionally drowned out, so the damaging erosion is caused by that west branch of Mortar Creek and would occur with or without the old bridge abutments.

There is erosion on the east abutment, but this erosion is slower because these are redirected, slower, floodplain flows due to the road embankment. Historically, this erosion is slower, but has propagated to a tipping point, that when exceeded, will result in bridge failure.

Figure 5. West Branch of Mortar Creek. The pink line shows the west branch of Mortar Creek and the blue line shows the main branch of Mortar Creek.

It is impossible to determine when exactly the streambank could move enough to make the bridge fail since it's impossible to predict exactly when those flow events that cause the most bank erosion will occur, however bridge failure is imminent without intervention.

2 EXISTING CONDITIONS – AFFECTED ENVIRONMENT

2.1 Hydraulics and Hydrology

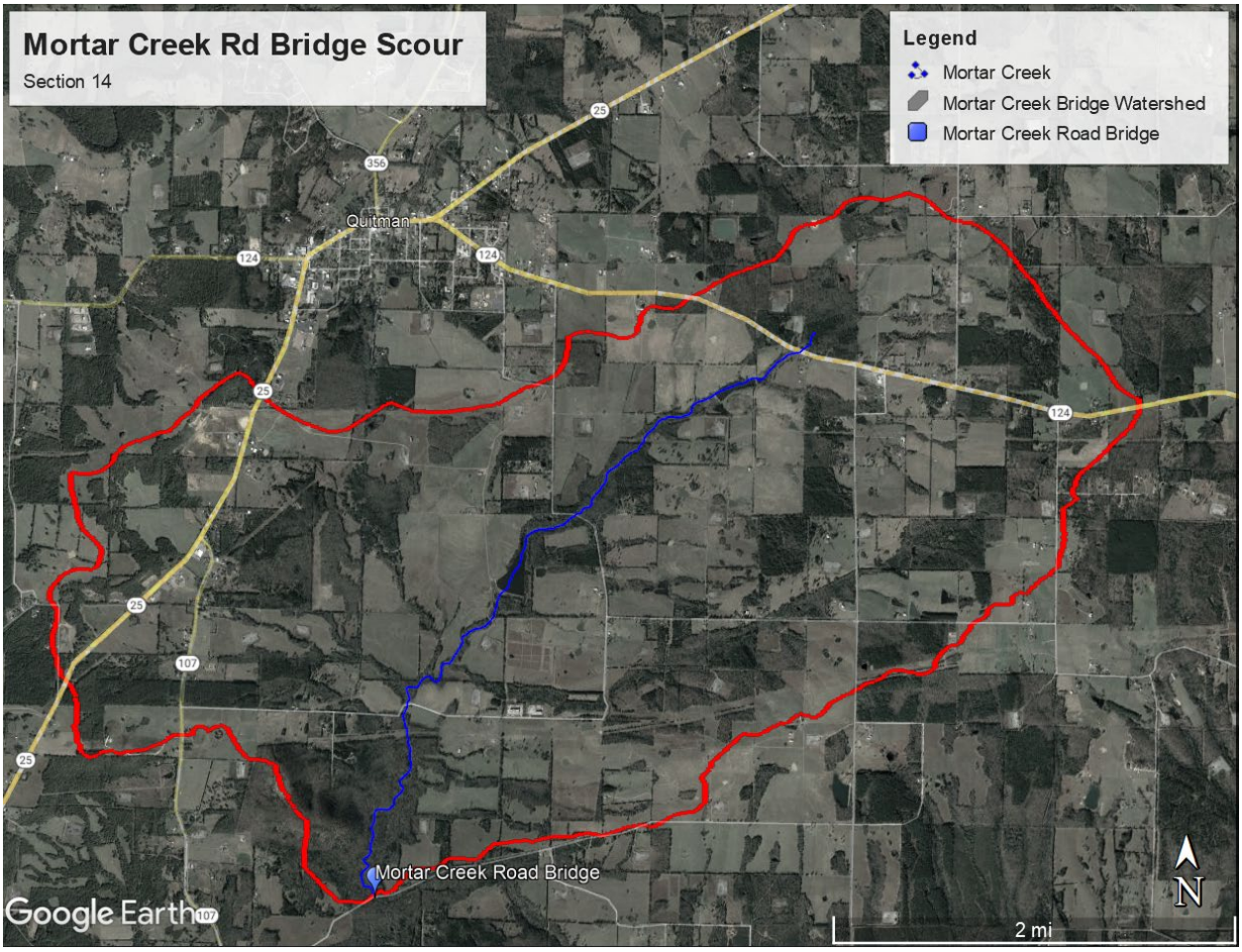

Figure 6. Mortar Creek Watershed

Figure 6 above shows the extent of the Mortar Creek watershed. The flow is being constricted to a small area directly upstream of the Mortar Creek Road Bridge due to the existing abutments from the old bridge. The deck of the old bridge was removed when the new bridge was built approximately 30 feet downstream; however, the old bridge abutments were just left in place. The old bridge abutments are approximately 3-5 feet lower than the new bridge abutments and have an opening width about 10-15 feet less than the new bridge.

During low flows, the velocity through the bridge is increased due to the old abutments. This is due to the equation Q=VA where Flow (Q) is equal to Velocity (V) times Area (A). The old bridge abutments decrease the area of flow and in turn increase the velocity. This increased velocity appears to be contributing to erosion downstream of the bridge along the banks.

During this higher flows, the old bridge abutments are submerged, and their effects are proportionally drowned out. Flow from the West Branch of Mortar Creek is attacking the rock protection and beginning to erode the material next to and under the road surface behind the wingwalls.

Table 1. AEP Flows at Mortar Creek Bridge from USGS Stream Stats, Drainage Area 10.6 sq. mi.

Annual Exceedance Probability	Return Period in years	Flow (cfs)
50-percent AEP flood	2	1180
20-percent AEP flood	5	2310
10-percent AEP flood	10	2900
4-percent AEP flood	25	4000
2-percent AEP flood	50	4900
1-percent AEP flood	100	5840
0.2-percent AEP flood	500	8340

2.2 Environmental Resources

These sections present a description of the environmental resources and baseline conditions that could be affected from implementing the proposed alternative in compliance with the National Environmental Policy Act (NEPA), the Council on Environmental Quality (CEQ), and 32 CFR 775 guidelines. The project study area occurs at the intersection of Mortar Creek and Mortar Creek Road within Faulkner County, Arkansas. Mortar Creek itself is a 4.5 mile stream that has experienced substantial flooding in recent years due to isolated rain events. Faulkner County has experienced three federally declared flooding disasters since 2014. As a result, several rural county road crossings in Faulkner County have sustained substantial erosion and the integrity of their structures is threatened. The Mortar Creek crossing at Mortar Creek Road is experiencing these problems as the creek is attempting to cut through the road at the crossing and reconnect at a different location on the downstream side. If this occurs, the bridge will be cut off from the road and drivers will not be able to cross the bridge. The road is heavily traveled by residents and farmers in the area.

2.3 Climate

The climate of the study area is humid subtropical with warm to hot summers and mild winters. The average annual high temperature is about 75 degrees Fahrenheit, with an average summer high of about 93 degrees for the months of June, July, and August, and an average annual winter low temperature of 55 degrees. Periods of freezing temperatures are infrequent and rainfall averages about 48 inches annually (NOAA, 2022). Severe weather occurs periodically in the form of severe thunderstorms, tornadoes, flood-producing extreme precipitation events, and winter ice storms (Runkle et al, 2022).

Changing climates are anticipated in the project area and include: increasing average annual temperatures, higher variability of annual precipitation, and higher variability of flow time, duration, and peak within Mortar Creek. A detailed climate change assessment is provided in Appendix A, Section A.8.

2.3.1 Climate Change

The US Army Corps of Engineers (USACE) Civil Works Program and its water resources infrastructure represent a tremendous Federal investment that supports public health and safety, regional and national economic development, and national ecosystem restoration goals.

The hydrologic processes underlying this water resources management infrastructure are very sensitive to changes in climate and weather. Therefore, USACE has a compelling need to understand and adapt to climate change and variability to continue providing authorized performance despite changing conditions. The objective is to mainstream climate change adaptation in all activities to help enhance the resilience of our built and natural water-resource infrastructure and reduce its potential vulnerabilities to the effects of climate change and variability.

Engineering and Construction Bulletin No. 2018-14 “Guidance for Incorporating Climate Change Impacts to Inland Hydrology in Civil Works Studies, Designs, and Projects” provides guidance for incorporating climate change information in hydrologic analyses in accordance with the USACE overarching climate preparedness and resilience policy and ER 1105-2-101. The objective of ECB-2018-14 is to enhance USACE climate preparedness and resilience by incorporating relevant information about observed and expected climate change impacts in hydrologic analyses for planned, new, and existing USACE projects. This includes consideration of both past (observed) changes as well as potential future, climate-changed, conditions to relevant climatic and hydrologic variables.

Project Location and Gaging Information

The Mortar Creek Emergency Streambank Erosion Protection and Prevention project area is located within the Hydrologic Unit Code (HUC) 11110205 - Cadron. Figure 7 shows the HUC location map for Arkansas and the location of the study area. Mortar

Creek eventually flows into the Cadron Creek and is Discharged into the Arkansas River around Navigation Mile 158.7 in Pool 8.

Figure 7. HUC Location in Arkansas

Literature Review

A literature search was conducted to locate information related to observed and projected climate trends. Natural ecosystems in the southeast region will be transformed by climate change. In the southeast, reductions in the frequency and intensity of cold winter temperatures can allow tropical and subtropical species to move northward and replace more temperate species. Drought and extreme heat can result in tree mortality and can also affect aquatic and wetland ecosystems. Increases in extreme rainfall can affect wetland plant mortality because of the prolonged inundation and lack of oxygen. Natural systems in the region will have to become resilient to both too little water and too much water. (Reidmiller, 2018)

According to "Recent US Climate Change and Hydrology Literature Applicable to US Army Corps of Engineers Missions – Arkansas, White and Red Rivers Region 11" the general consensus for the for this region is a mild upward trending for average precipitation and extreme precipitation events as well as an upward trending for average streamflow.

Temperature

Temperature data wasn't available at Mortar Creek but analysis of observed daily temperature at the Little Rock weather station shows trends that are consistent with those observed for the United States. Figure 8 shows the monthly and yearly average temperatures from 1879 – 2021 for the Little Rock area. The data trend to the increase of average temperature for the Little Rock area in the future.

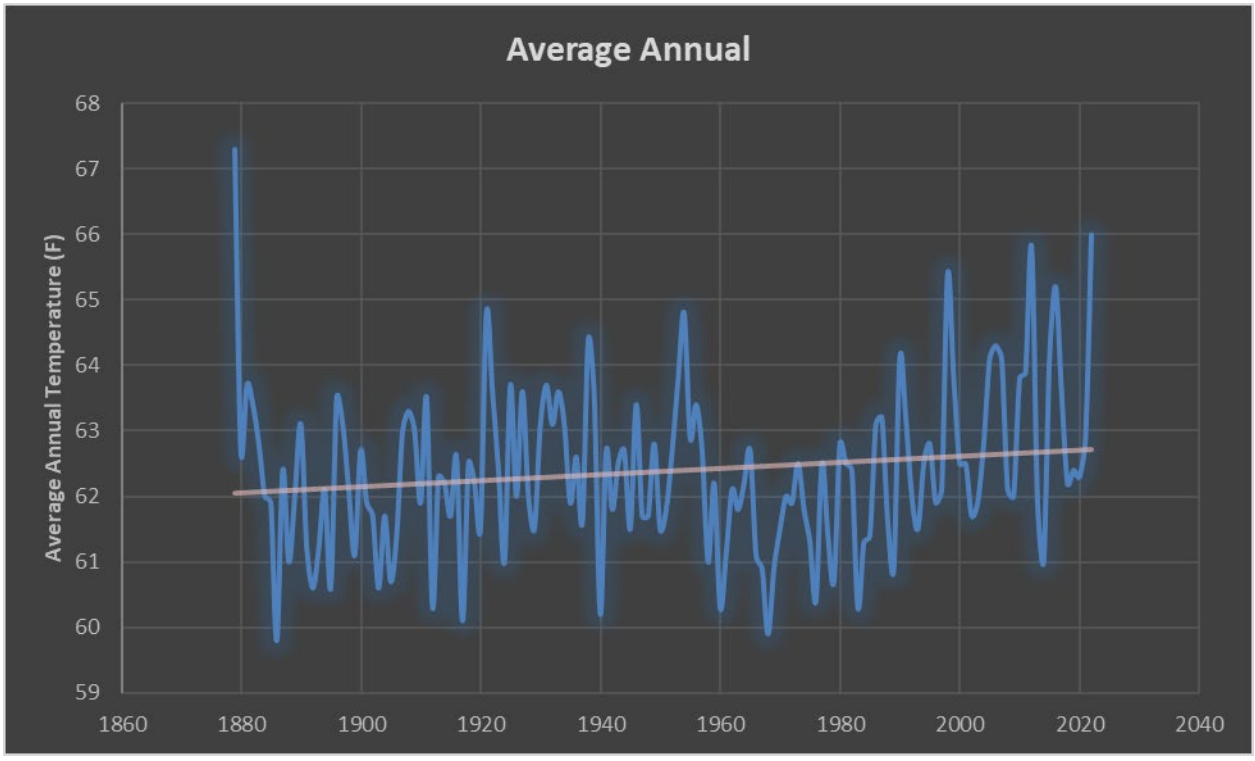

Figure 8. Trend in Average Annual Temperatures in Little Rock, AR.

Precipitation

Mortar Creek is situated right at the junction of the Ozarks with the Arkansas Valley. The average annual precipitation for the Mortar Creek area is around 49 inches. Precipitation extremes vary from 28.26 inches in 1963 to 81.79 inches in 2009. During some of these events, rain has exceeded 5 inches in several hours and caused flash flooding. Yearly precipitation totals from 1876 – 2022 are shown in Figure 9.

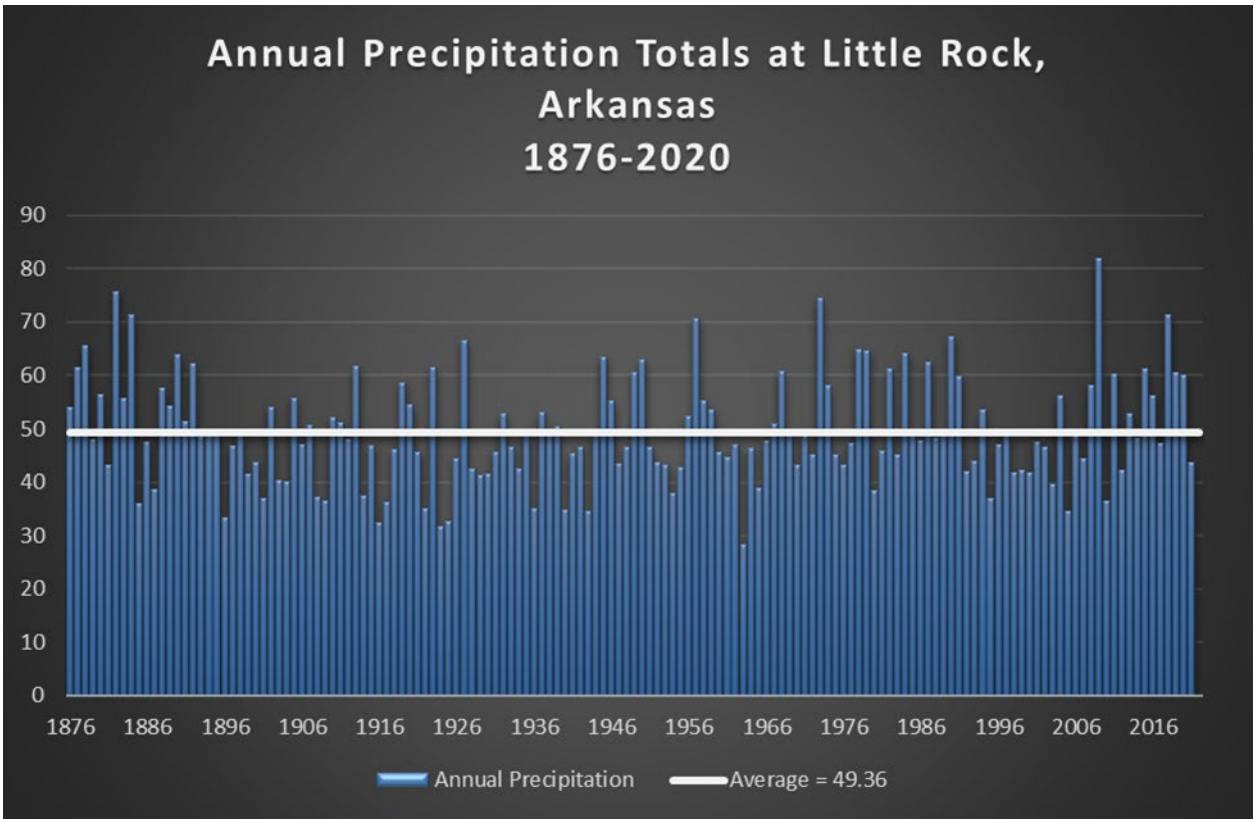

Figure 9. Annual Precipitation at Lake Maumelle, Arkansas.

Observed precipitation information from the Fourth National Climate Assessment for the Southeast region is shown in Figure 10. By every metric, there has been an increase in heavy precipitation in Arkansas; the five-year maximum daily precipitation has increased by 10-19%, the 99% precipitation has increased between 20-29%, and the number of 5-year, 2-day events has increased 40+%

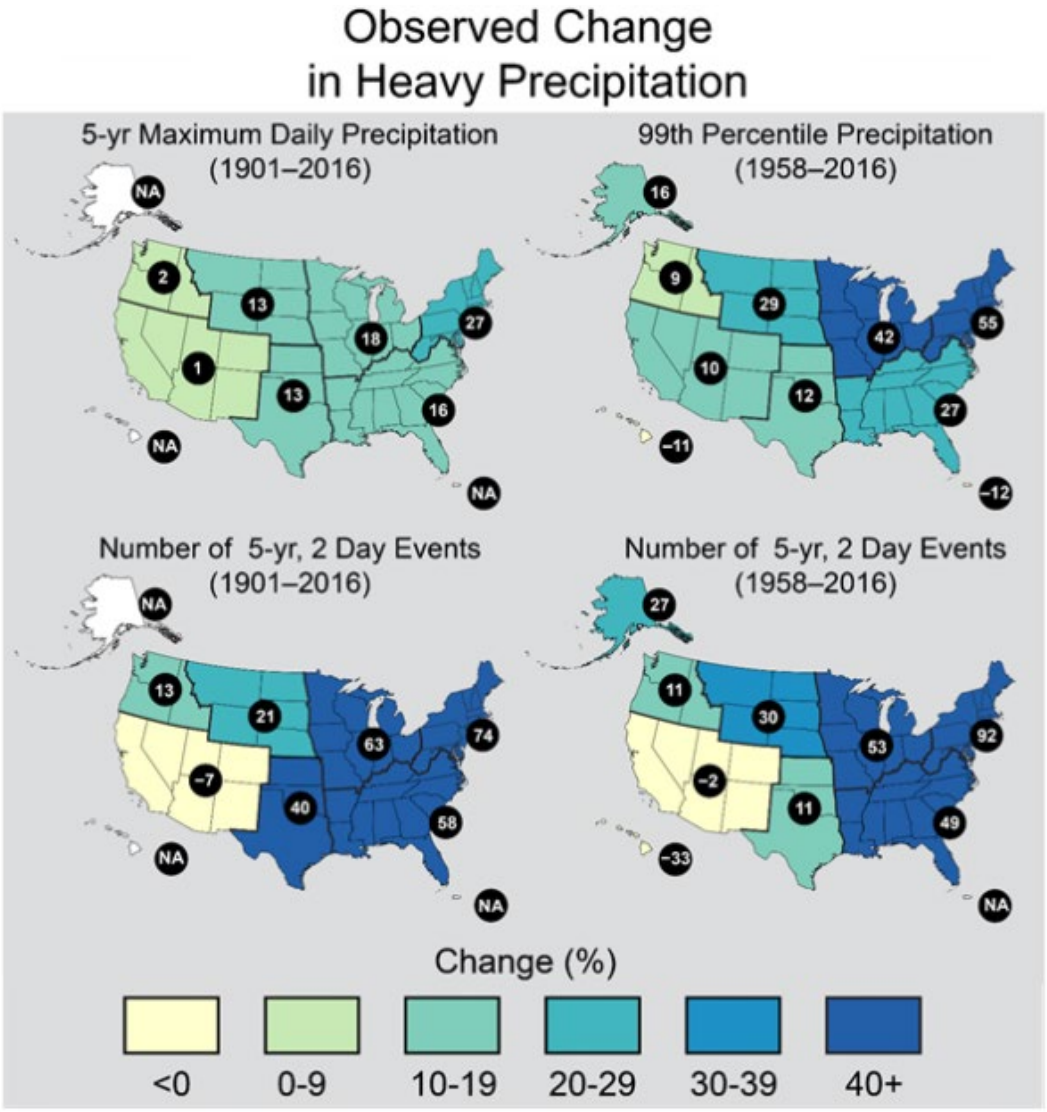

Figure 5. These maps show the change in several metrics of extreme precipitation by NCA4 region, including (upper left) the maximum daily precipitation in consecutive 5-year blocks, (upper right) the amount of precipitation falling in daily events that exceed the 99th percentile of all non-zero precipitation days, (lower left) the number of 2-day events with a precipitation total exceeding the largest 2-day amount that is expected to occur, on average, only once every 5 years, as calculated over 1901–2016, and (lower right) the number of 2-day events with a precipitation total exceeding the largest 2-day amount that is expected to occur, on average, only once every 5 years, as calculated over 1958–2016. The numerical value is the percent change over the entire period, either 1901–2016 or 1958–2016. The percentages are first calculated for individual stations, then averaged over 2° latitude by 2° longitude grid boxes, and finally averaged over each NCA4 region. Note that Alaska and Hawai'i are not included in the 1901–2016 maps owing to a lack of observations in the earlier part of the 20th century. (Figure source: CICS-NC and NOAA NCEI). (NCA4 Vol.1, Chapter 7: Precipitation Change in the United States, Fig 7.4)

Figure 10. Observed and Changes of Several Metrics of Extreme Precipitation.

Time Series Analysis

The USACE Time Series Toolbox includes the Non-stationarity Detection Tool was developed in conjunction with USACE Engineering Technical Letter (ETL) 1100-2-3, Guidance for Detection of Non-stationarities in Annual Maximum Discharges, to detect non-stationarities in maximum annual flow time series (USACE, Time Series Toolbox, 2023). This tool was also used to assess abrupt or slowly varying changes in observed peak flow data collected by the USGS gage located along Cadron Creek for the period of record spanning 1955 – 2023. The t-test, Mann-Kendall test, and Spearman Rank-Order test all indicate no statistically significant increasing trend in the annual peak stream flow.

Vulnerability Assessment to Climate Change Impacts

The USACE Climate Hydrology Assessment Tool (CHAT) was used to enhance USACE climate preparedness and resilience. The USACE CHAT was used to investigate potential future trends in streamflow for the Maumelle River watershed. The projected streamflow computations are computed at the HUC8 watershed scale, 11110205. As expected for this type of qualitative analysis, there is considerable, but consistent spread in the projected annual maximum monthly flows. The spread in the projected annual maximum monthly flows is indicative of the high degree of uncertainty associated with projected, climate changed hydrology.

The USACE Watershed Climate Vulnerability Assessment Tool was also used to compare the relative vulnerability of the HUC 1111, Lower Arkansas, to climate change to the other watersheds across the continental United States. The tool uses the Weighted Order Weighted Average (WOWA) method to represent a composite index of how vulnerable a given HUC-4 watershed (Vulnerability Score) is to climate change specific to a given business line. The USACE Climate Vulnerability Assessment Tool makes an assessment for two 30-year epochs of time centered at 2050 and 2085. These two periods were selected to be consistent with many of the other national and international analyses. The tool assesses how vulnerable a given watershed is to the impacts of climate change for a given business line for all global climate models. The top 50% of the traces is called the “wet” subset of traces and the bottom 50% of the traces is called the “dry” subset of traces. There is a combination of four epoch subset combinations, which provide for an indication of the variability/uncertainty in the outputs.

For a given scenario and a given business line, only the top 20% of the HUCs are marked as vulnerable. The score for flood risk reduction line for HUC-1111 does not change appreciably across the 4 scenarios. HUC-1111 is considered vulnerable in the Dry 2050 and Dry 2085 Forecast

2.4 Geology

The project area is in a region known as the Arkansas Valley (37) Ecoregion. This region is a band about 40 miles wide that lies between the Ozark Mountains to the north and the Ouachita Mountains to the south. It generally parallels the Arkansas River (and Interstate 40) for most of its length. The region includes geological features typical of

both the Ozarks and the Ouachitas, including dissected plateaus like those of the Ozarks and folded ridges like those of the Ouachitas. However, some features are characteristic of the Arkansas Valley itself, including isolated, flat-topped, steep-sided mesas like Petit Jean Mountain, Mount Nebo, and Mount Magazine, is more hilly than the Arkansas Valley Plains (37d) and less rugged than Ecoregions 36, 37a, and 38. (Woods et al., 2004). It is comprised of plains, hills, floodplains, terraces, and scattered mountains. The Atoka formation underlies the study area (Eifler et al., 1994). The unit is a sequence of marine, mostly tan to gray silty sandstones and grayish-black shales but typically contains discontinuous streaks of coal coaly shale within the study area (McFarland 2004).

2.5 Soils

The Farmland Protection Policy Act (FPPA) (Public Law 97-98, Title XV, Subtitle I, Section 1539-1549 requires federal actions to minimize unnecessary and irreversible conversion of farmland to nonagricultural uses, specifically prime farmlands. The Act defines prime farmlands as "…land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion…" The Natural Resources Conservation Service (NRCS) is responsible for designating soils as prime farmland soils.

The project area consists of the crossing between Mortar Creek and Mortar Creek Road. The area surrounding the bridge consists of riparian forests. Based on the Soil Survey of Faulkner County, Arkansas (Soil Conservation Service, 1988), soils surrounding the project area are classified in the Spadra soil series, which is classified as a fine well-drained, sandy loam found on stream terraces with low slopes (Figure 11). According to Soil Survey Geographic Database (SSURGO) information acquired from the NRCS (2011), soils within the Spadra series are considered prime farmlands (Soil Survey Staff, 2023).

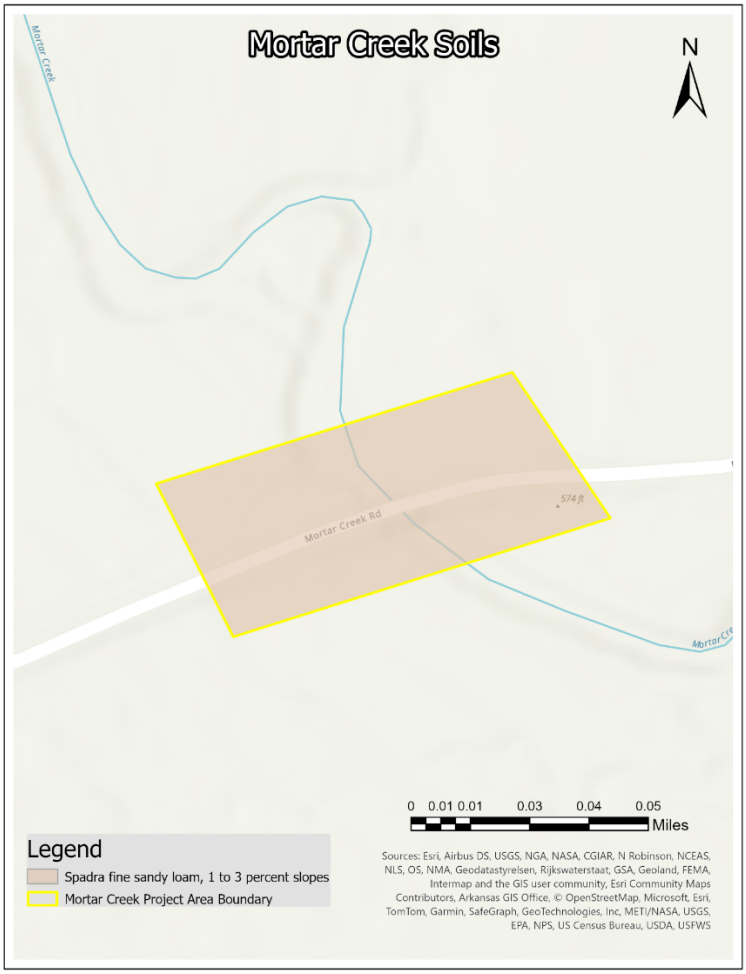

Figure 11. NRCS Web Soil Survey Map

2.6 Surface Water

Mortar Creek lies in the Arkansas Valley – Arkansas River Eco basin. Streams in this Eco basin vary from slow, meandering streams following major valley floors to smaller, riffle and pool types in the smaller watersheds. Mortar Creek is a 4.5-mile long tributary to Clear Creek which eventually leads into East Fork Cadron Creek and the Arkansas River. Mortar Creek is within the Clear-Creek-East Fork Cadron Creek watershed (HUC 111102050302).

The project area consists of a shallow stream about X feet wide. Flow through the site is generally slow moving and perennial. A fairly well-developed run is found upstream of the bridge, with a riffle type complex flowing under the bridge and terminating in a pool immediately downstream of the bridge. Despite erosion occurring in the area, turbidity is low and the water clarity is good. The stream bed is composed of some silts and sands towards the center of the channel, while larger cobbles are found along the shoreline and at the bridge.

2.7 Floodplains

The project area is classified as Zone A without base flood elevation (BFE) on the Federal Emergency Management Flood Insurance Rate Map as part of the Faulkner County Unincorporated Areas (0545C0100H) (Figure 12). Immediately in the project area, floodplain characteristics are restricted due to the presence of the bridge and abutments. On either side of the bridge natural floodplain exists.

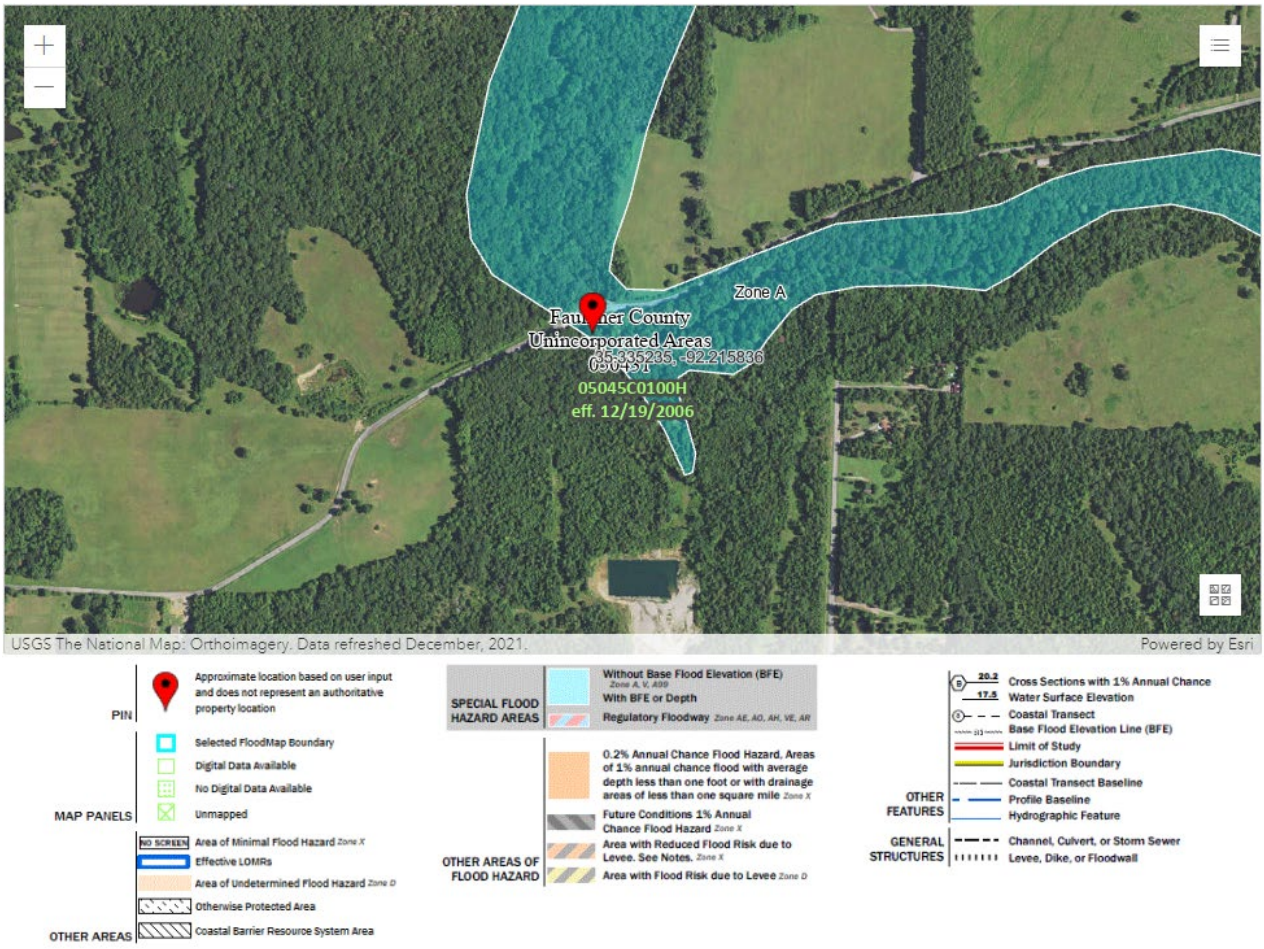

Figure 12. FEMA Flood Insurance Rate Map for the Project Area

2.8 Water Quality

Regional water quality is influenced by lithology, soil composition and land use activities. Water quality in the Arkansas Valley is generally good while average stream gradients and dissolved oxygen levels are typically lower than waters in the Ouachita Mountains or Ozark Highlands, whereas turbidity, total suspended solids, total organic carbon, total phosphorus, and biochemical oxygen demand values are typically higher.

Section 303(d) of the Clean Water Act (CWA) requires states to identify waters where existing pollution controls are not stringent enough to achieve state water quality standards and establish a priority ranking of these waters. The Arkansas Department of Energy and Environment (ADEE), Department of Environmental Quality (ADEQ) is responsible for assessing water quality monitoring data and developing a 303(d) list every two years in accordance with the CWA. The Arkansas's Draft 2022 303(d) List represents the most recent evaluation of water quality data. Mortar Creek itself is not listed as an impaired waterbody for any appraised metrics. There are no waterbodies upstream of Mortar Creek that would contribute to the understanding of its water quality (Arkansas Department of Energy and Environment, 2022).

2.9 Wetlands

Wetlands are often defined as areas where the frequent and prolonged presence of water at or near the soil surface drives the natural system including the type of soils (i.e. hydric soils) that form, the plants that grow and the fish and/or wildlife that use the habitat. The existing project footprint (Figure 13) covers approximately 0.10 acres with 100 percent of that occurring in Riverine wetlands.

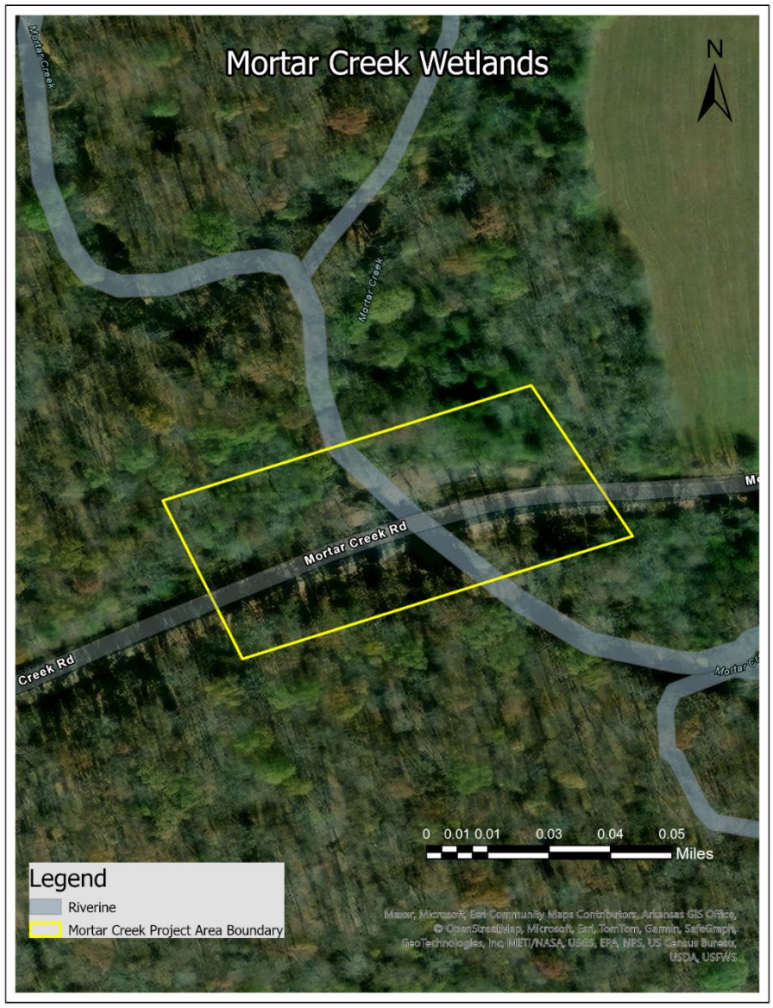

Figure 13. Wetlands within the Project Study Area

2.10 Biological Resources

2.10.1 Vegetation

The project area is located in the Arkansas Valley Region which lies between the Ozark Mountains to the north and the Ouachita Mountains to the south (Encyclopedia of Arkansas Date). It generally parallels the Arkansas River (and Interstate 40) for most of its length. The Arkansas Valley Hills ecoregion is characterized by hills, valleys, and cuestas, with some scattered low mountains. The project area is comprised of dense riparian forests dominated by bottomland oaks and various shrub species along the banks of Mortar Creek.

2.10.2 Aquatic Resources

Mortar Creek has habitat conditions that can support many species of fish and invertebrates (Table 2). Fish communities characteristically in the area include a sunfish and minnow-dominated community along darters and occasional catfishes and an assemblage of macroinvertebrates. No protected or sensitive species are known to occur in the creek.

Table 2. Species Potentially Occurring in the Project Area

Common Name	Scientific Name
Magazine Stripetail	*Isoperla szczytkoi*
Microcaddisfly	*Paucicalcaria ozarkensis*
Nearctic Paduniellan Caddisfly	*Paduniella nearctica*
Mayfly	*Paraleptophlebia calcarica*
Elevated Spring Amphipod	*Stygobromus elatus*
Boston Mountains Crayfish	*Cambarus causeyi*
Alabama Shad	*Alosa alabamae*
Arkansas River Shiner	*Notropis girardi*
Pyramid Pigtoe	*Pleurobema rubrum*
Purple Lilliput	*Toxolasma lividum*
Isopod	*Lirceus bicuspidatus*
Queen Snake	*Regina septemvittata*
Alligator Gar	*Atractosteus spatula*
Plains Minnow	*Hybognathus placitus*
Longnose Darter	*Percina nasuta*
American Eel	*Anguilla rostrata*
Paddlefish	*Polyodon spathula*
Blue Sucker	*Cycleptus elongatus*
Bluntface Shiner	*Cyprinella camura*

2.10.3 Wildlife

The rural landscape surrounding the Mortar Creek crossing on Mortar Creek provides ample habitat for several common species of birds and mammals. Table 3 provides a partial list of common bird and mammal species known to occur in areas near the project area that may use the project area for foraging, nesting, resting, or migration.

Table 3. Common Wildlife Species in the Vicinity of the Project Area

Common Name	Scientific Name	Common Name	Scientific Name
Birds			
American kestrel	*Falco sparverius*	Lesser scaup	Aythya affinis
Barred owl	*Strix varia*	Mallard	Anas platyrhynchos
Black vulture	*Coragyps atratus*	Ring-neck duck	Aythya collaris
Blue jay	*Cyanocitta cristata*	Wood duck	Aix sponsa
Bobwhite quail	*Colinus virginianus*	Prothonotary warbler	Protonotaria citrea
Canada goose	*Branta canadensis*	Red-headed woodpecker	Melanerpes erythrocephalus
Cardinal	*Cardinalis*	Mockingbird	Mimus polyglottos
Common yellowthroat	*Geothlypis trichas*	Mourning dove	Zenaida macroura
Eastern phoebe	*Sayornis phoebe*	Robin	Turdus migratorius
Eastern wood-pewee	*Contopus virens*	Turkey vulture	Cathartes aura
Great horned owl	*Bubo virginianus*	Red-tailed hawk	Buteo jamaicensis
		Eastern wild turkey	Meleagris gallopavo
Kentucky warbler	*Geothlypis formosa*	Worm-eating warbler	Helmitheros vermivorum
Mammals			
Black bear	Ursus americanus	Opossum	Didelphis virginiana
Eastern gray squirrel	Sciurus carolinensis	Raccoon	Procyon lotor
White-tailed deer	Odocoileus virginianus	Nine-banded armadillo	Dasypus novemcinctus
Coyote	Canis latrans	Red fox	Vulpes
Little brown bat	Myotis lucifugus	Gray fox	Urocyon cinereoargenteus
Eastern cottontail	Sylvilagus floridanus	Eastern chipmunk	Tamias striatus
Woodchuck	Marmota monax	Beaver	Castor canadensis
Striped skunk	Mephitis	Bobcat	Felis rufus

2.10.4 Threatened and Endangered Species

The USFWS Information for Planning and Consultation (IPaC) tool was utilized to determine species listed under the Endangered Species Act that may occur in or near the Mortar Creek crossing area (USFWS, 2023a). A total of seven federally threatened or endangered species were identified; however, the project area only contains suitable habitat for the two bat species (Table 4). No federally designated critical habitat for any of the listed species is present in the action area. The bald eagle has been delisted but the protections provided by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act remain in effect.

2.11 Recreational Resources

Occasional fishing, hiking or wildlife watching may occur immediately along the creek; however, the creek is bordered on all sides by private land making other recreational activities unavailable due to restricted land access.

2.12 Socioeconomics

Socioeconomics is defined as the basic attributes and resources associated with the human environment, particularly population, demographics, and economic development. Demographics entail population characteristics and include data pertaining to race, gender, income, housing, poverty status, and educational attainment. Economic development or activity typically includes employment, wages, business patterns, an area's industrial base, and its economic growth.

The socio-economic characteristics of Quitman, Arkansas, the nearest town located near the project study area, and the State of Arkansas are presented in Table 5 . The City of Quitman had a population of 694 living in 289 households in 2020. The racial makeup of the city was 91.4 percent White, 0.6 percent African American, 0.6 percent Native American, 0.1 percent Asian, 0.0 percent other, and 4.5 percent from two or more races. Of the total population, 2.0 percent were of Hispanic or Latino origin. Roughly 15.9 percent of families in the city live below the poverty line compared to 16.1 percent in the state (U.S. Census Bureau, 2020).

Table 4. Federally Listed Species identified on the IPaC

Species Name	Status	Habitat Description	Suitable Habitat
Mammals			
Northern long-eared bat Myotis septentrionalis	E	Summer habitat: wide variety of forested/wooded habitats for roosting. Utilizes areas such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures for foraging. Winter habitat (hibernacula): underground caves or cave-like structures.	Summer Habitat: Yes Winter Habitat: No
Tricolored bat Perimyotis subflavus	PE	Summer habitat: wide variety of forested/wooded habitats for roosting. Roost among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally manmade structures. Winter habitat (hibernacula): caves or abandoned mines.	Summer Habitat: Yes Winter Habitat: No
Birds			
Eastern black rail Laterallus jamaicensis ssp. jamaicensis	T	Dense marshes and wetlands with minimal to no shrub cover and no trees. Can be in areas that are impounded or tidally influenced.	No -forested riparian area lacking dense herbaceous layer
Piping plover Charadrius melodus	T	Coastal and along migratory route habitats include sand spits, small islands, tidal flats, shoals and sandbars with inlets.	No - shorelines are rocky and surrounded by Riparian Forest
Rufa red knot Calidris canutus rufa	T	Wintering and migration habitats are muddy or sandy coastal areas, specifically, bays and estuaries, tidal flats, and unimproved tidal inlets with sand spits, islets, shoals, and sandbars	No - shorelines are rocky and surrounded by Riparian Forest
Reptiles			
Alligator snapping turtle Macrochelys temminckii	PT	Freshwater rivers and lakes with deep floors.	No – generally too shallow
Insects			
Monarch butterfly *Danaus plexippus*	C	Prairies, meadows, grasslands and along grassy roadsides. Require its host plant, milkweed, for its reproductive cycle.	No – forested riparian area lacking host plant

E= Endangered T= Threatened PE= Proposed Endangered PT= Proposed Threatened C= Candidate
Source: U.S. Fish and Wildlife Service IPAC website and Arkansas Ecological Service Office database.

Table 5. Population Data for Quitman, Arkansas

Population Metric	Quitman, Arkansas	Arkansas
Population		
Total Population	694	3,011,524
Total Households	289	1,199,395
Race and Ethnicity		
White	91.4%	70.2%
Black or African American	0.6%	15.1%
Native American or Alaska Native	0.6%	0.9%
Asian	0.1%	1.7%
Native Hawaiian or Other Pacific Islander	0.0%	0.5%
Other Race	0.9%	4.5%
Two or More Races	4.5%	7.1%
Hispanic	2.0%	8.5%
Age		
Under 5 years	6.1%	5.7%
5 to 19 years	19.8%	20.0%
20 to 64 years	54.5%	56.5%
Over 64 years	19.9%	17.5%
Education		
High School Diploma	46.4%	33.9%
Bachelor's Degree or Higher	17.5%	23.8%
Household Income		
Median Household Income	$36,667	$55,432
Less than $14,999	10.0%	5.9%
$15,000 to $24,999	10.3%	9.5%
$25,00 to $49,999	36.7%	22.6%
$50,000 to $74,999	13.8%	18.1%
Greater than $75,000	21.2%	36.6%

USCB, 2020

2.13 Environmental Justice

In compliance with Executive Order (EO) 12898, Federal Action to Address Environmental Justice in Minority and Low-Income Populations, an analysis using the Climate and Economic Justice Screening Tool (CEJST) was to identify disadvantaged communities in or near the project area (Figure 14). The tool identifies disadvantaged communities if they are in a census tract that meets the thresholds for at least one of the tool's categories of burden, or if they are on land within the boundaries of Federally Recognized Tribes. The CEJST showed that Faulkner County was classified as being a disadvantaged county because it meets more than one burden threshold and the associated socioeconomic threshold (Table 6).

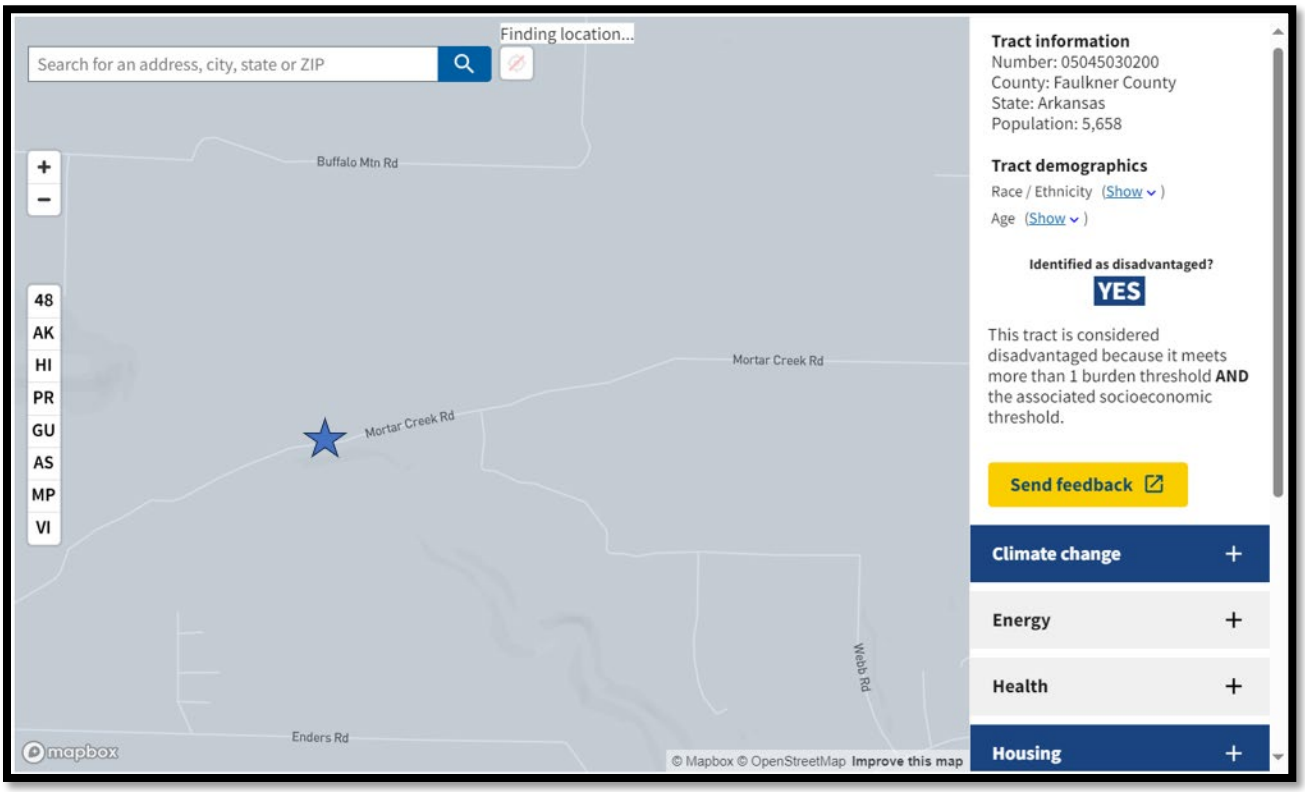

Figure 14. Climate and Economic Justice Screening Tool Results for the Project Area

Table 6. Factors Contributing to the Project Area Being within a Disadvantaged Community

Burden Description		Threshold	Location Value
Climate Change: Expected Population Loss Rate	Fatalities and injuries resulting from natural hazards each year	Above 90th percentile	95th percentile
Housing: Lack of Indoor Plumbing	Share of homes without indoor kitchens or plumbing	Above 90th percentile	95th percentile
Transportation: Transportation Barriers	Average of relative cost and time spent on transportation	Above 90th percentile	99th percentile
Low Income	People in households where income is less than or equal to twice the federal poverty level, not including students enrolled in higher education	Above 65th percentile	78th percentile

2.14 Noise

Federal and local governments have established noise guidelines and regulations for the purpose of protecting citizens from potential hearing damage and from various other adverse physiological, psychological, and social effects associated with noise. The Federal Interagency Committee on Urban Noise developed land-use compatibility guidelines for noise in terms of day-night average sound level (DNL). It is recommended that no residential uses, such as homes, multifamily dwellings, dormitories, hotels, and mobile home parks, be located where the noise is expected to exceed a DNL of 65 decibels (dBA). For outdoor activities, the Environmental Protection Agency (EPA) recommends DNL of 55 dBA as the sound level below which there is no reason to suspect that the general population would be at risk from any of the effects of noise (EPA, 1974). Noise-sensitive receptors are facilities or areas where excessive noise may disrupt normal activity, cause annoyance, or loss of business. Land uses such as residential, religious, educational, recreational, and medical facilities are more sensitive to increased noise levels than are commercial and industrial land uses.

Site visits of the project area show that the bridge is located in a rural area comprised of farmland and forested land and is one half of a mile away from the nearest residential home. There are no other sensitive noise receptors, such as schools, churches, hospitals within a one-mile radius of the project area.

2.15 Air Quality

The U.S. Environmental Protection Agency (EPA) has the primary responsibility for regulating air quality nationwide. The Clean Air Act (42 U.S.C. 7401 et seq.), as amended, requires the EPA to set National Ambient Air Quality Standards (NAAQS) for wide-spread pollutants from numerous and diverse sources considered harmful to public health and the environment. The Clean Air Act established two types of national

air quality standards classified as either “primary” or “secondary.” Primary standards set limits to protect public health, including the health of at-risk populations such as people with pre-existing heart or lung diseases (such as asthma), children, and older adults. Secondary standards set limits to protect public welfare, including protection against visibility impairment, damage to animals, crops, vegetation, and buildings.

EPA has set NAAQS for six principal pollutants, which are called “criteria” pollutants. These criteria pollutants include carbon monoxide, nitrogen dioxide, ozone, particulate matter less than 10 microns, particulate matter less than 2.5 microns, sulfur dioxide and lead. If the concentration of one or more criteria pollutant in a geographic area is found to exceed the regulated “threshold” level for one or more of the NAAQS, the area may be classified as a non-attainment area. Areas with concentrations of criteria pollutants that are below the levels established by the NAAQS are considered either attainment or unclassifiable areas.

The project area is located within Faulkner County, Arkansas and is part of an area designated as in attainment, meaning concentrations of criteria pollutants are below the levels established by the NAAQS.

2.16 Hazardous, Toxic, and Radioactive Waste (HTRW)

Preliminary investigation found no indication of potential HTRW sources in the area that would impact the project. There are no recognized environmental conditions within one mile of the project area.

2.17 Cultural Resources

Federal agencies are required under Section 106 of the National Historic Preservation Act to “take into account the effects of their undertakings on historic properties” and consider alternatives “to avoid, minimize or mitigate the undertaking’s adverse effects on historic properties” [(36 CFR 800.1(a-c)] in consultation with the State Historic Preservation Officer (SHPO) and appropriate federally recognized Indian Tribes (Tribal Historic Preservation Officers - THPO) [(36 CFR 800.2(c)]. In accordance with this and other applicable regulations, including the National Environmental Policy Act of 1969 (NEPA) and Engineer Regulation (ER) 1105-2-100, USACE has reviewed of the Arkansas Archeological Survey’s Automated Management of Archeological Sites Data in Arkansas (AMASDA) database to better determine the existing conditions and potential risks of encountering cultural resources.

The review of the AMASDA database revealed that no archeological sites have been identified in the project area, but there has not been a cultural resources survey performed in the vicinity. In addition, a review of the Arkansas Historic Preservation Program’s Structure Database was performed and did not indicate any previously recorded historic buildings, structures, or objects.

2.18 Real Estate

Preliminary investigations have revealed two potential landowners in the footprint of the project, the sponsor has also indicated that these two potential landowners, are also in full support of the project. Currently one utility has been identified in the vicinity of the project, a buried copper communications line, presumably owned by Windstream. Contact made with Windstream revealed that the utility has no real estate interest in the area. In addition, a final Opinion of Compensability provided by SWL Office of Counsel determined the utility holds no real property interest in the area and is non-compensable. The sponsor in this project holds no traditional real estate interests in the area, however, they have provided documents supporting their right to reconstruct, construct, perform maintenance, and other such activities on Mortar Creek Road. These rights were obtained through utilizing AR Code § 27-66-207, in which the County Judge can dedicate a public road or throughfare as a County Rd. It is currently unknown how these rights will affect the project, but the only anticipated effects are positive.

3 FUTURE WITHOUT PROJECT CONDITIONS

The NFS currently maintains Mortar Creek Road and the bridge. Bridge maintenance consists of spot armament in the vicinity of the bridge to fend off erosive damages which would compromise the integrity of the structure. The current maintenance does not address the root cause of the problems at the crossing. Unless emergency streambank protection is instituted, Mortar Creek will continue to experience erosion of the streambank. The result would be failure of the roadway and/or bridge behind the upstream wingwalls during a major flood event or multiple smaller events depending on the flood duration. Without Federal action, failure of the Mortar Creek crossing on Mortar Creek Road is imminent. This would culminate in a closure of the road until repaired, causing traffic issues for the local inhabitants and delayed response time for emergency response vehicles. Mortar Creek Road is the main road into and out of the area east of the Mortar Creek crossing with any alternative route adding approximately 10 miles to the destination. The traffic along the alternative route would also increase leading to a further increase in transportation costs and emergency response times along roads which are likely not intended to support the higher volume of traffic. Also, if the former bridge abutments in proximity of the current structure fails, the current structure would fail as a result. In addition, intense flooding could fragment and degrade habitat and promote encroachment and/or establishment of invasive species within the project area.

There are no anticipated conditions or impacts to the project site without any real estate portion of the project in place. This is due to the real estate portion of the project only existing if a project is in place.

From an environmental perspective (No Action), there would be no change from the existing condition for all resources except soils, habitats, and water quality. No action would not involve any construction and therefore no temporary impacts. Over the long-term soils would continue to erode causing loss of streambank stability and habitat and additional turbidity. None of these impacts would rise to the level of significant but would be contribute to a degraded quality of the environment in the immediate area.

4 PLAN FORMULATION AND SELECTION

Section 14 studies are designed to implement projects to protect public facilities and facilities owned by non-profit organizations and used to provide public services that are open to all on equal terms. These facilities must have been properly maintained but be in imminent threat of damage or failure by natural erosion processes on stream banks and shorelines and must be essential and important enough to merit Federal participation in their protection. The streamlined formulation and justification procedures are in recognition of the urgency of addresses such projects.

As prescribed in EP 1105-2-58, Paragraph 29.d, following a finding of eligibility, and given the narrow geographic focus, low cost of these (CAP Section 14) projects, and the imminent threat to the facilities, the formulation and evaluation focuses on the least-cost alternative solution. The least cost alternative plan is considered to be justified if the total cost of the proposed alternative is less than the costs to relocate the threatened facility.

4.1 Specific Planning Problem

A problem is an undesirable condition in need of a solution.

- Mortar Creek flows are resulting in natural erosion of the streambank in the vicinity of the bridge at Mortar Creek Road .
- Mortar Creek flows are resulting in natural erosion in the vicinity of the bridge abutments and threatening the integrity of the structure.

4.2 Specific Planning Opportunity

An opportunity is set of circumstances that makes it possible to do address a problem.

- An opportunity exists to prevent injury and possible death from road failure.
- An opportunity exists to restore Mortar Creek to a more natural flow path and function by reducing mature vegetation loss.
- An opportunity exists to possibly use engineering with nature (bioengineering).

4.3 Specific Planning Objective

An objective is a statement of the intended purposes of the project. These are statements of what the recommended plan will try to achieve.

- Protect the streambank in the vicinity of Mortar Creek Road from erosion until a permanent solution can be implemented.

- Prevent closure of Mortar Creek Road due to natural erosional forces until a permanent solution can be implemented.

4.4 Specific Planning Constraints

Planning constraints and planning considerations are those things unique to this feasibility study that alternatives should avoid and consider or that may limit plan formulation, selection, or construction. There are no planning constraints which would impact plan formulation; however, the following items are planning considerations that were taken into account during the plan formulation.

- NFS has limited funds. The NFS does have the ability to partner in the project, but limited funding should be considered in the timing of design and construction.

- Possible utilities within the project footprint. One utility line was identified in the vicinity of the project with no real estate interest and the design may need to be minimally altered to avoid the utility line.

- Two lane road with steep shoulder may limit the placement of laydown areas. The steep shoulder incline could require laydown areas that may restrict traffic flow on Mortar Creek Road for a short period of time.

4.5 Management Measures Considered

A. Remove former bridge abutment- remove remnants of former bridge at Mortar Creek crossing.

B. Surface erosion control – For example, riprap, geotextiles, or plantings along the bank in the vicinity of Mortar Creek Road for erosion control.

C. Build out bank – Install fill in the eroded areas of the stream bank in the vicinity of Mortar Creek Road.

D. Redirective structures- Bendway weirs, j-hooks, gabion baskets.

E. Energy dissipators- within channel-devices that protect downstream areas by reducing the velocity, energy, and turbulence of the flow within the channel.

F. Extending wingwalls- extension of the wingwalls of the crossing structure to reduce erosion.

G. Install culvert(s) – Install culverts to control flow in the vicinity of Mortar Creek Road.

H. Realign Creek- Straighten channel or create meanders to control flow at Mortar Creek Road crossing.

I. Replace Bridge – Replace the bridge at Mortar Creek road to prevent washout and closure of the road.

J. Remove bridge- Remove bridge completely at Mortar Creek crossing.

K. Relocate bridge- relocate the bridge at Mortar Creek Road crossing to a more stable location.

4.6 Management Measures Screened

The PDT performed a screening of the management measures with the results summarized in Table 7 below and more details in the following paragraphs.

Table 7. Measures Screening

Measure	Screening Result
Remove former bridge abutment	Carried forward
Surface erosion control	Carried forward
Build out bank	Carried forward
Redirective structures	Carried forward
Energy dissipators	Not effective
Extending wingwalls	More expensive
Install culvert(s)	Not effective
Realign Creek	Not effective, more expensive, environmental concerns
Replace Bridge	Not effective, expensive
Remove bridge	Not effective, removes access
Relocate bridge	Expensive

Measure E - Energy dissipators- energy dissipators would not be effective in resolving the issue and would raise the project cost if combined with other measures.

Measure F - Extending wingwall- extending the wingwall would be more expensive than other measures that solve the problem and meet the objectives.

Measure G - Install culvert(s)- a culvert would not be effective in resolving the issue of erosion and the degradation of road in the vicinity of Mortar Creek.

Measure H - Realign Creek- realigning the creek may introduce environmental and landowner concerns, may induce more severe erosion in the project area, may need a larger footprint and need another bridge or culvert, would not be effective in solving the problems and meeting the objectives and would likely be expensive and more complicated than other measures and thus not included in the least cost plan.

Measure I - Replace Bridge- replacing the bridge is likely not within the Federal statutory participation limits and likely not the least cost plan. Bridge replacement also would not be effective in resolving the issue of erosion and the degradation of road in the vicinity of Mortar Creek.

Measure J - Remove Bridge- removing the bridge could create a larger problem by removing access to the public and would not address underlying issues.

4.7 Initial Array of Alternatives

During PDT discussions, it was noted that no alternative would be effective unless the former bridge abutments were removed as they were expounding the natural erosion processes occurring in the creek, therefore alternatives were developed to account for this requirement. The initial array of alternatives is listed below.

- Alternative 1 – No Action
- Alternative 2 – Remove former bridge abutment alone (measure A)
- Alternative 3 – Protect bank and remove former bridge abutment (measure A and B)
- Alternative 4 – Build out bank and remove former bridge abutment (measure A and C)
- Alternative 5 – Build out and protect bank and remove former bridge abutment (measures A, B, and C)
- Alternative 6 – Build out, protect bank, redirective structures and remove former bridge abutment (measures A, B, C and D)
- Alternative 7 – Remove former bridge abutment, protect bank upstream and redirective structures downstream (measures A, B and D)
- Alternative 8 – Relocate Bridge (measure K)

4.8 Preliminary Screening of Alternatives

During the multiple iterations of planning, the PDT performed alternative screening with a summary of results shown below in Table 8.

Table 8. Alternatives Screening

Alternative	Screening Result
Alternative 1 – No Action	Carried Forward
Alternative 2 – Remove former bridge abutment alone	Does not address the study objectives
Alternative 3 – Protect bank and remove former bridge abutment	Carried Forward
Alternative 4 – Build out bank and remove former bridge abutment	Does not fully address the study objectives
Alternative 5 – Build out and protect bank and remove former bridge abutment	Carried Forward
Alternative 6 – Build out, protect bank upstream, redirective structures downstream and remove former bridge abutment	More expensive, no significant added benefits and no further minimization of environmental impacts
Alternative 7 – Remove former bridge abutment, protect bank upstream and redirective structures downstream	Carried Forward

Alternative 1 – No Action. If no action is taken at Mortar Creek, the streambank will continue to erode and lead to failure of the bridge or the road approaches at the Mortar Creek Road crossing.

Alternative 2 – Remove former bridge abutment alone. This alternative would not address the objectives because existing damage is too extensive. This alternative was screened from further consideration.

Alternative 3 – Protect bank and remove former bridge abutment. This alternative would reduce erosion, provide emergency streambank protection, and prevent closure of Mortar Creek Road, but would not address current damage to the streambank. This alternative was carried forward for detailed analysis.

Alternative 4 – Build out bank and remove former bridge abutment. This alternative is not a complete solution. Without some sort of erosion control the soil would wash away and need to be replaced. This alternative was screened from further consideration.

Alternative 5 – Build out and protect bank and remove former bridge abutment. This alternative would reduce erosion, provide emergency streambank protection, address current damage to the streambank, and prevent closure of Mortar Creek Road.. This alternative was carried forward for detailed analysis.

Alternative 6 – Build out, protect bank, provide redirective structures, and remove former bridge abutment. While this alternative would reduce erosion and provide protection to the streambank, it would cost more than other complete alternatives without adding significant protection or further minimizing environmental impacts. This alternative was screened from further consideration.

Alternative 7 – Remove former bridge abutment, protect bank upstream and provide redirective structures downstream. This alternative would reduce erosion, provide emergency streambank protection, address current damage to the streambank and prevent closure of Mortar Creek Road. This alternative was carried forward for detailed analysis.

Alternative 8 – Relocate Bridge would not reduce erosion of the streambank but would relocate the bridge out of the area of erosion and prevent closure of Mortar Creek Road. A newer bridge design could also incorporate expanded wingwalls that would prevent the erosion that affects the current bridge. Relocating the bridge would be more expensive than the other alternatives and result in significant environmental impacts and was therefore screened from the final array. However, the cost of Alternative 8 is the justification criteria for this CAP Section 14 project.

4.9 Alternatives Carried Forward

The initial screening of the alternatives provided a final array of four (4) alternatives. The alternatives carried forward are detailed below.

Alternative 1 – No Action – Erosion would continue to occur along the banks of Mortar Creek further endangering the crossing at Mortar Creek Road.

Alternative 3 – Protect bank and remove former bridge abutments. This alternative consists of demolishing and removing the concrete bridge abutments and footings which are adjacent to the north side of the existing bridge. These abutments form a narrower opening than the existing bridge, therefore, the existing bank is widened and cut back at a 2H:1V slope. This slope is hardened with R400 riprap. See Figure 15.

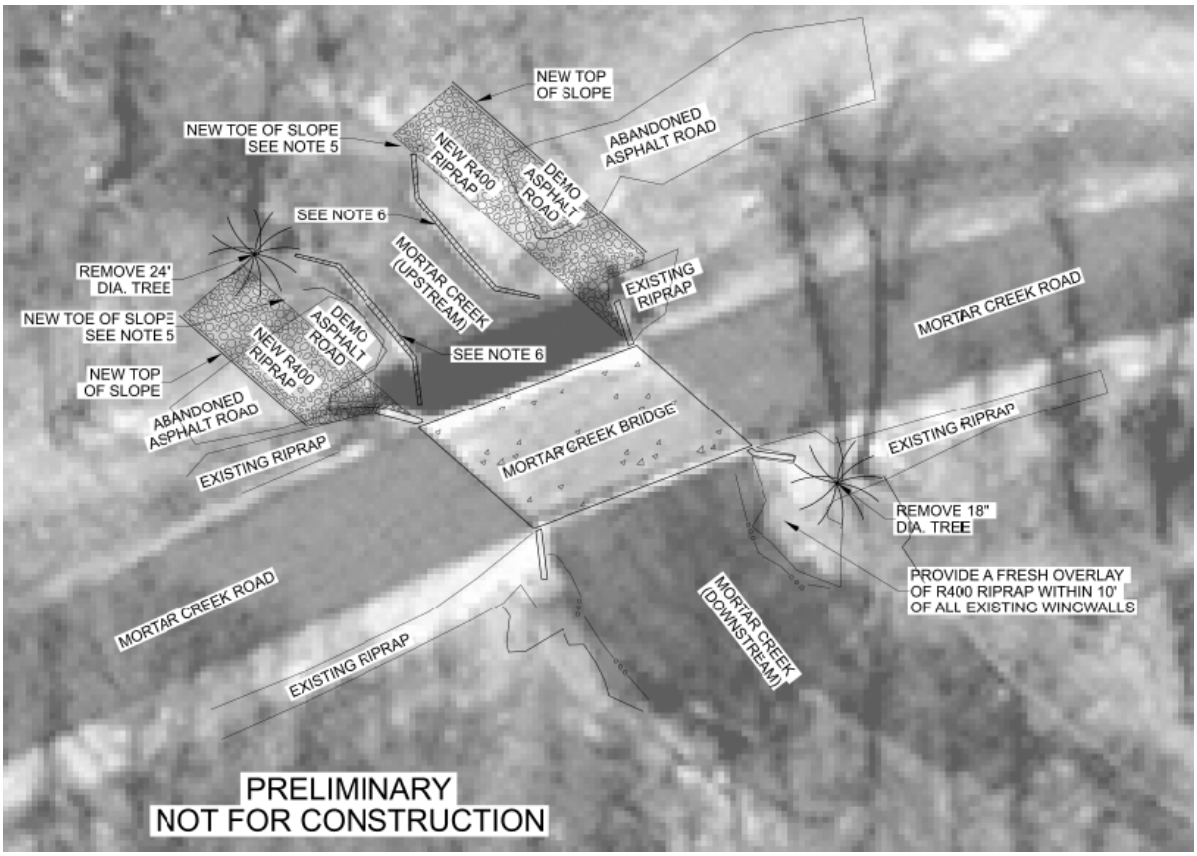

Figure 15. Alternative 3 - Protect Bank and Remove Bridge Abutments

Alternative 5 – Build out and protect bank and remove former bridge abutments. This alternative consists of the work done in Alternative 3 plus building out the downstream right descending bank and protecting with riprap that has been eroded away, but not threatening the integrity of the structure. See drawing Figure 16.

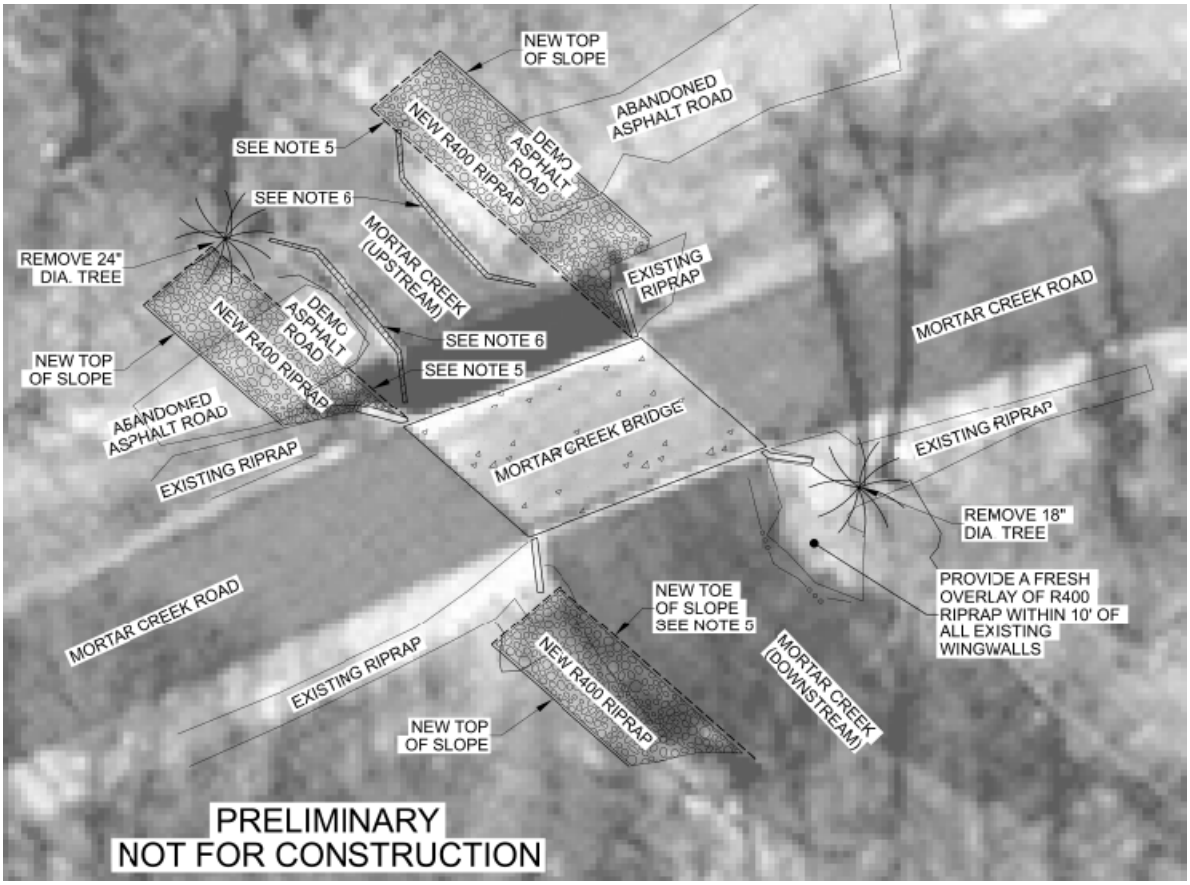

Figure 16. Alternative 5 - Build Out and Protect Bank and Remove Former Bridge Abutments

Alternative 7 – Remove former bridge abutment, protect bank upstream, and provide redirective structures downstream. This alternative consists of the work done in Alternative 3 plus providing redirective structures on the downstream right descending bank instead of the work proposed in Alternative 5. See Figure 17.

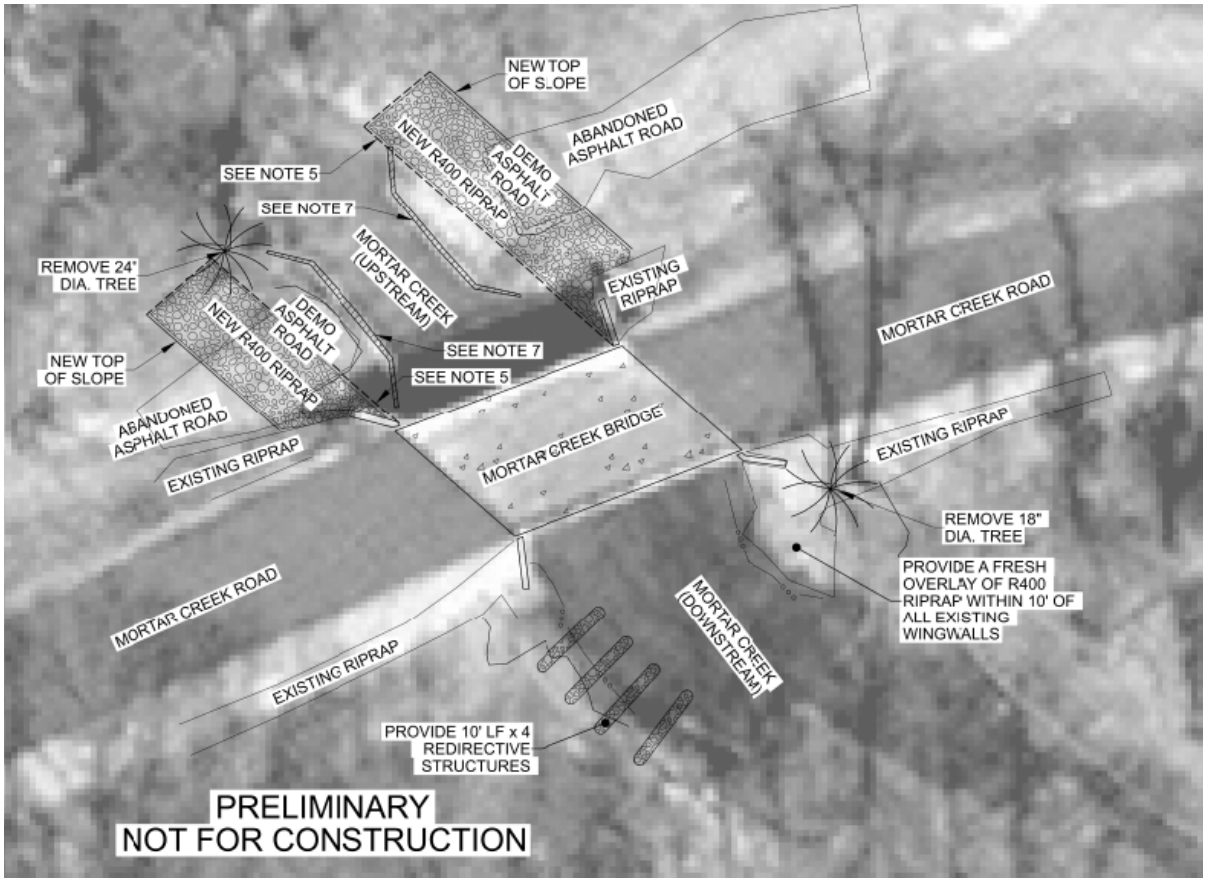

Figure 17. Alternative 7 - Remove Former Bridge Abutments, Protect Bank Upstream and Provide Redirective Structures Downstream

4.9.1 Planning Criteria

Three alternatives in addition to relocating the bridge meet the objectives of reducing the risk of streambank erosion damage to this public infrastructure along Mortar Creek protecting the crossing and preventing closure of a major road in the area (Table 9). These alternatives also minimize cost and reduce environmental impacts.

Table 9. Planning Criteria Alternative Evaluation

	No Action	Alt 3	Alt 5	Alt 7
Completeness – Does the alternative provide and account for all required investments to meet planning objectives?	NO	YES	YES	YES
Effectiveness – Does the alternative contribute to meeting the planning objectives?	NO	YES	YES	YES
Efficiency – Is the alternative the efficient way of meeting the planning objectives?	NO	YES	Yes	Yes
Acceptability – Does the alternative meet all applicable laws, regulations and public policies?	NO	YES	YES	YES

4.9.2 Alternative Cost Analysis

Before the PDT selected a tentatively selected plan (TSP), cost estimates were developed for all alternatives in the final array prior to the TSP milestone. Estimated first costs at TSP identification for Alternative 3 is approximately $201,000, Alternative 5 is approximately $242,000, Alternative 7 is $257,000 (Table 10), and Alternative 8 (relocation) is $2.04M and therefore screened due to cost.

Table 10. Estimated First Costs of Alternatives at TSP Identification

Alternative	Estimated Project First Costs
Alternative 1: No Action	$0
Alternative 3: Protect bank and remove former bridge abutment	$201,000
Alternative 5: Build out and protect bank and remove former bridge abutment	$242,000
Alternative 7: Remove former bridge abutment, protect bank upstream and redirective structures downstream	$257,000

FY2024 Price Levels, Dollars, Discount Rate of 2.75%

As CAP Section 14 projects are intended as an emergency solution Operations, Maintenance, Repair, Rehabilitation and Replacement (OMRRR) are minimal to non-existent. The annual costs include a minimal $2,200 for OMRRR in each alternative.

Average annual costs are the amortized investment cost (first cost plus interest during construction) over a 50-year period of analysis using the FY24 Federal Discount Rate of 2.75%, plus the average annual OMRRR. The three action alternatives are economically justified since they are less than the annual cost to relocate the bridge which is approximately 10 times the cost of the action alternatives. Alternative 3 is the least cost alternative of the three action alternatives, with a first cost of $201,000 and an average annual cost of $9,671 (Table 11).

Table 11. Derivation of Average Annual Costs at TSP Identification

Investment	Alt 3	Alt 5	Alt 7
Estimated First Cost	$201,000	$242,000	$257,000
Construction Time (months)	2	2	2
Interest During Construction	$683	$822	$873
Investment Costs	$201,683	$242,822	$257,873
Annual Charges			
Interest	$5,546	$6,678	$7,092
Amortization	$1,924	$2,317	$2,460
OMRRR	$2,200	$2,200	$2,200
Total Annual Charges	$9,671	$11,194	$11,752

FY 2024 Price Levels, 50 Year Period of Analysis, 2.75% Federal Interest Rate, Dollars

4.9.3 Comprehensive Benefits

Due to the small nature and low cost of Section 14 CAP studies, a qualitative analysis of comprehensive benefits was performed by the PDT with results shown in Table 12 below.

Table 12. Comprehensive Benefits Evaluation

	No Action	Alt 3	Alt 5	Alt 7
NED	N/A	Positive NED Benefits	Positive NED Benefits	Positive NED Benefits
RED	N/A	Very small bridge in rural area, this alternative would reduce risk of road closure, minimal RED benefits	Very small bridge in rural area, this alternative would reduce risk of road closure, minimal RED benefits	Very small bridge in rural area, this alternative would reduce risk of road closure, minimal RED benefits
EQ	N/A	No significant impacts to environmental resources, this alternative would prevent environmental damage from bridge failure	No significant impacts to environmental resources, this alternative would prevent environmental damage from bridge failure. Added streambank protection downstream would add to environmental quality by preventing erosion to downstream environment.	No significant impacts to environmental resources, this alternative would prevent environmental damage from bridge failure. Added streambank protection downstream would add to environmental quality by preventing erosion to downstream environment.

OSE	N/A	This alternative would prevent road closure due to failure of the bridge. This would prevent higher transportation costs of an alternative route and prevent excessive response times for emergency vehicles and personnel	This alternative would prevent road closure due to failure of the bridge. This would prevent higher transportation costs of an alternative route and prevent excessive response times for emergency vehicles and personnel	This alternative would prevent road closure due to failure of the bridge. This would prevent higher transportation costs of an alternative route and prevent excessive response times for emergency vehicles and personnel

4.10 Uncertainties and Their Risks

- Lack of cultural resources surveys in the area that may impact location of staging areas, access routes, and any excavation
    - Risk – Low.. There are no known cultural resources on the site.
        - Mitigation – USACE is coordinating with the AR State Historic Preservation Office and Tribes. If the USACE determines that the undertaking shall have an adverse effect on historic properties as measured by criteria in 36 CFR § 800.5(a)(1), the USACE shall consult with all parties to the Programmatic Agreement (PA) to resolve adverse effects in accordance with 36 CFR § 800.6.
- Potential to encounter threatened and endangered species in the area.
    - Risk – Low. Several species whose populations are declining are present within the boundaries of the general project area. However, due to the extremely small footprint of the project and the habitat preferences of the species the chance of encountering them on this project is very low.
        - Mitigation –Should any protected wildlife species be sighted during construction; all activities would stop. U.S. Fish & Wildlife and Arkansas Game and Fish Commission biologists would be contacted to determine if construction activities can continue

without adverse effects to protected wildlife species.

- One utility line (telephone) has been identified in the general project area.
    - Risk - Low. The PDT is coordinating with the utility owner to determine the exact location of the utility line both horizontally and vertically.
        - Mitigation – If needed the design will be adjusted minimally to work around the utility line.

5 RECOMMENDED PLAN – ALTERNATIVE 3

Figure 18. Mortar Creek Recommended Plan. Green areas show general area of streambank protection, red lines represent the old bridge abutments to be removed and the dark red figures show the tree removals. Not shown: riprap placement around all four wingwalls.

Alternative 3 is The TSP and is the least cost plan that addresses the streambank erosion problem and meets the study's objectives. Alternative 3 consists of protecting bank and removing former bridge abutments (Figure 18). This alternative consists of demolishing and removing the concrete bridge abutments and footings which are adjacent to the north side of the existing bridge. These abutments form a narrower opening than the existing bridge, therefore, the existing bank would be widened and cut back at a 2H:1V slope. This slope is hardened with R400 riprap. In addition, all four wingwalls of the current bridge abutment would be reinforced with R400 riprap.

5.1 Total Estimated Costs

Alternative 3 is the recommended plan to address the bank instability problem because it is the least-cost alternative and is economically justified given the cost is less than the cost to relocate the threatened structure (Alternative 8). Alternative 3 would protect the bank from further erosion and prevent failure of the bridge. Following selection of the recommended plan, the cost estimate for Alternative 3 was refined following technical

reviews, and an abbreviated risk analysis (ARA) was conducted to identify the proper contingency factor (see Appendix D: Cost Engineering). Although these refinements were only conducted for the costs of the recommended plan, the costs for the other alternatives would have increased proportionately resulting in Alternative 3 still being the least cost plan. Following these refinements, the project first cost of the recommend plan, is estimated to be approximately $441,000 (Table 13 and TPCS in Appendix D: Cost Engineering).

Table 13. First Costs for the Mortar Creek Recommended Plan

Features	Federal Cost (65%)	Non-Federal Cost (35%)	Total
Mob/Demob	$45,500	$24,500	$70,000
Demo Old Bridge Abutments	$29,900	$16,100	$46,000
Remove Fill	$18,850	$10,150	$29,000
Remove Trees	$4,550	$2,450	$7,000
Place Riprap	$64,350	$34,650	$99,000
Preconstruction, Engineering and Design (PED)	$100,100	$53,900	$154,000
Lands and Damages		$7,000	$7,000
Supervision, Inspection and Overhead (SIOH)	$19,500	$10,500	$30,000
Total	$282,750	$159,250	$441,000

FY2024 Price Levels, Dollar, 2.75% Discount Rate
*LERRDS are NFS cost, not cost-shared

The construction cost allocation for CAP Section 14 projects is 65% Federal and 35% NFS, with a $10 million maximum on the Federal contribution (inclusive of planning costs). Based on a 65%/35% allocation, the Federal share would be $282,750 and the NFS share would be $159,250, inclusive of $7,000 for LERRDS and a $19,400 cash requirement.

The cost allocation does not include the costs of the feasibility study. The first $100,000 of the feasibility study costs for CAP Section 14 projects is 100% Federal cost and any additional feasibility costs are cost shared 50% Federal and 50 % Non-Federal. The cost of this feasibility study was approximately $202,000. The Federal share of the feasibility study was approximately $151,000 and NFS share was approximately $51,000.

The average annual cost of the recommended plan is $18,591 (Table 14).

Table 14. Average Annual Cost of the Recommended Plan

Investment	Alternative 3
Estimated First Cost	$441,000
Construction Time (months)	2
Interest During Construction	$1,498
Investment Costs	$442,498
Annual Charges	
Interest	$12,169
Amortization	$4,222
OMRRR	$2,200
Total Annual Charges	**$18,591**

FY2024 Prices, 2.75% Interest Rate, 50 Year Period of Analysis

5.2 Real Estate Considerations

Bank Protection Easement (BPE) and Temporary Work Area Easement (TWAE) are the LER standard estates required for this project, for the purpose of stabilizing the stream bank, removing flow restrictions, and staging and laydown. An estimated 0.08 acres of BPE, and 0.38 acres of TWAE are required to support the project. Estate language for all referenced estates is shown in Figure 1 Appendix C of the Real Estate Plan, while a map of the LER required is shown below Figure 19.

However, it's not anticipated that any LER will need to be acquired for the project, due to the NFS holding the necessary rights to complete the project through the statutory scheme provided in Arkansas Code Annotated (ACA) §§ 14-298-101 to -125; which provides the sponsor with the authority to make necessary repairs to roads and their environs that have been established as a public thoroughfare; which includes the county-maintained Mortar Creek Rd. and bridge; where the project is located.

Currently, a single utility has been identified (Figure 20), a buried Windstream communications line, as being potentially impacted by the project. However, a final Opinion of Compensability provided by SWL Office of Counsel determined the utility holds no real property interest in the area and is non-compensable.

The real estate cost and schedule will be updated accordingly if additional utilities are discovered during the DI phase of the project. For more real estate information, see Appendix C: Real Estate Plan.

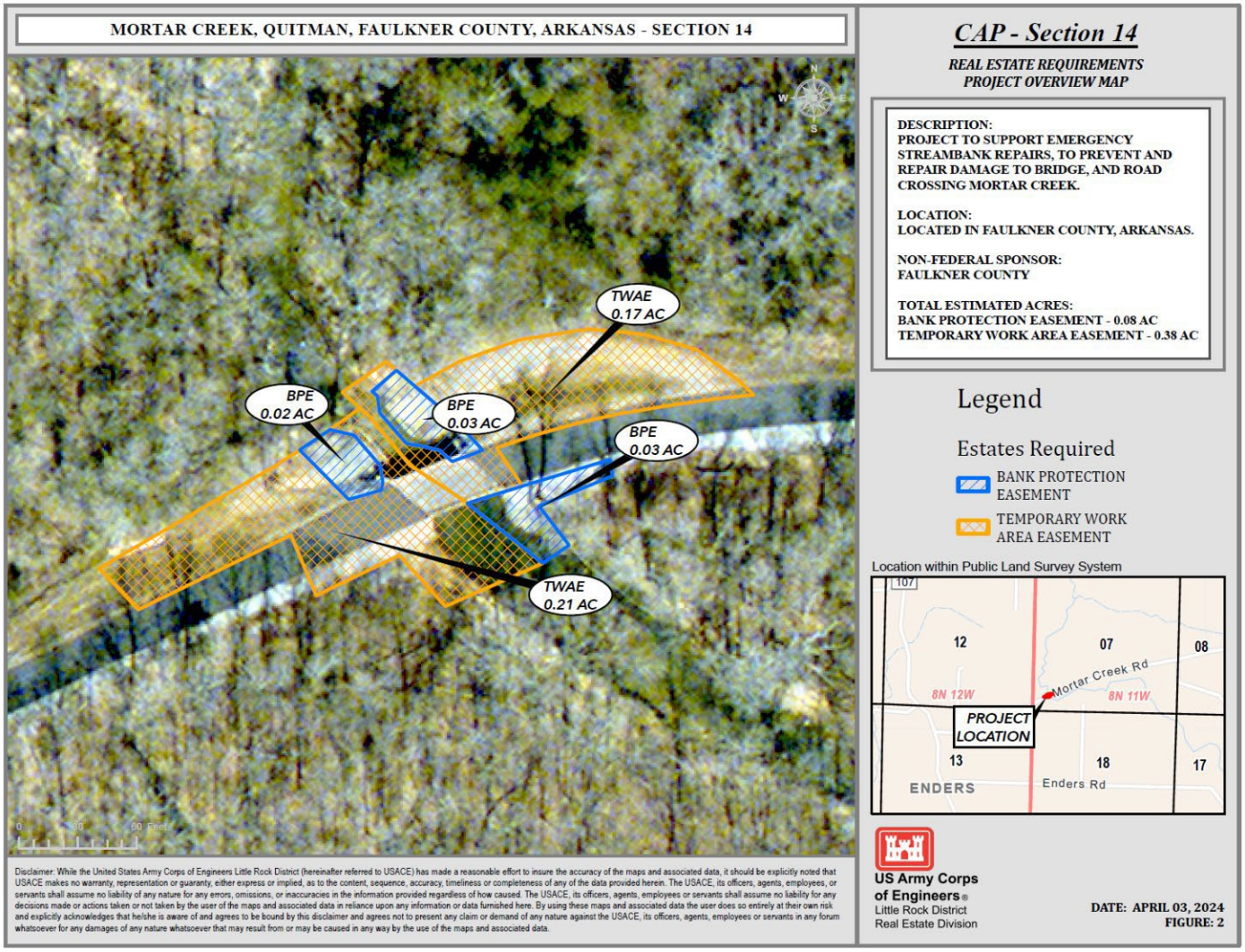

Figure 19. Easements Required

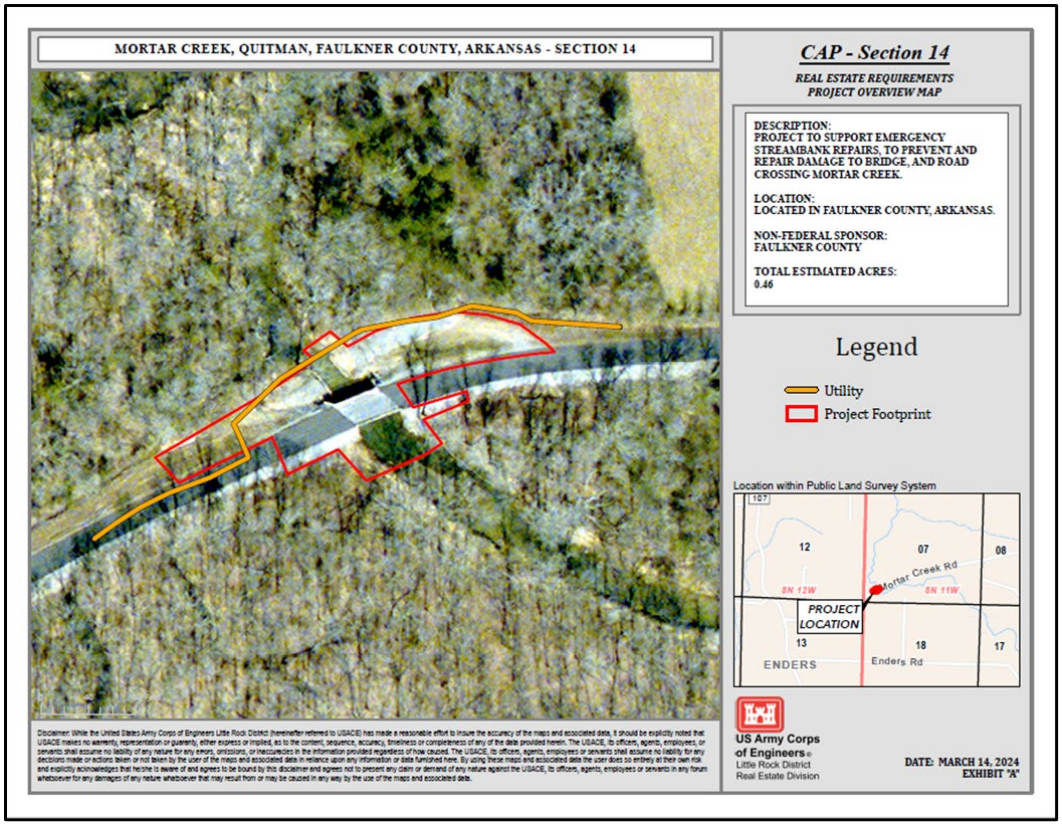

Figure 20. Utilities in the Mortar Creek Project Area

6 Environmental Consequences

This section describes the natural and human environments that exist at the project and the potential impacts of the No Action Alternative (Alternative 1) and Alternative 3. While Alternative 5 and Alternative 7 were in the final array, both of these alternatives involved further constrictions to the stream and required more fill than Alternative 3, as well as being higher in cost. Therefore, these alternatives were not further analyzed for impacts.

Impacts (consequences or effects) can be either beneficial or adverse and can be either directly related to the action or indirectly caused by the action. Direct effects are caused by the action and occur at the same time and place (40 CFR § 1508.8 [a]). Indirect effects are caused by the action and are later in time or further removed in distance but are still reasonably foreseeable (40 CFR § 1508.8 [b]). As discussed in this section, the alternatives may create temporary (less than one year), short-term (up to three years), long-term (three to ten years), or permanent impacts following the implementation of the Recommended Plan.

Whether an impact is significant depends on the context in which the impact occurs and the intensity of the impact (40 CFR § 1508.27). The context refers to the setting in which the impact occurs and may include society as a whole, the affected region, the affected interests, and the locality. Impacts on each resource can vary in degree or magnitude from a slightly noticeable change to a total change in the environment. For the purpose of this analysis, the intensity of impacts would be classified as negligible, minor, moderate, or major. The intensity thresholds are defined as follows:

- Negligible: A resource would not be affected or the effects would be at or below the level of detection, and changes would not be of any measurable or perceptible consequence.
- Minor: Effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.
- Moderate: Effects on a resource would be readily detectable, long-term, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- Major: Effects on a resource would be obvious and long-term, and would have substantial consequences on a regional scale. Mitigation measures to offset the adverse effects would be required and extensive, and success of the mitigation measures would not be guaranteed.

6.1 Soils

Disturbances to soil would be primarily from removal of the former bridge abutments and the addition of riprap material from backhoe activities. Once the bridge abutments are removed, the soil once covered with concrete would be exposed, while the location of rip rap would be covered with rip rap stone and no longer exposed to erosion. Temporary, minor adverse effects on soils are expected.

All construction activities will be limited to the roadway easement at the bridge and along the streambank which would not typically be a desirable location for farming and would be unavailable for farming despite the soils being suitable until the easement is removed. The proposed work would not impact the characteristics of the soil or cause mixing of horizons; therefore, if the rip rap and bridge were to be removed in the future, the soils present would still be considered prime farmlands. No impacts to prime farmlands are expected.

6.2 Climate

The proposed project encompasses a relatively small area when compared to the global scale. Therefore, any changes with respect to climate change resulting from the No Action and Action Alternatives would be negligible.

At the state level, Greenhouse Gasses (GHGs) are a regulated pollutant under the Prevention of Serious Degradation program when emissions exceed the thresholds set in Regulation 19- Regulations of the Arkansas Plan of Implementation for Air Pollution Control. The threshold for new source emissions is the project emissions are above the major source threshold for a regulated pollutant that is not GHGs and will emit or have the potential to emit 75,000 tons per year (tpy) or more CO_2e.

Construction activities associated with the Action Alternatives would generate GHG emissions as a result of combustion of fossil fuels while operating on- and off-road mobile sources. The primary GHGs generated during construction are CO_2, CH_4, and N_2O. The other GHGs such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are typically associated with specific industrial sources and processes and would not be emitted during construction. When comparing the estimated GHG emissions from each considered alternative, the Recommended Plan was found to have lower overall emissions than Alternatives 5 & 7 since less construction equipment would be needed.

After construction is complete, all GHG emissions would cease, and the area would return to baseline conditions. Overall, the total direct and indirect adverse impacts would be constrained to very small increases in GHG emissions to the atmosphere from operation of on- and off-road mobile sources. The operational emissions expected from the life of the Recommended Plan are expected to be minimal due to the small size and duration of the project.

CO_2 emissions are highly correlated to fuel use. Approximately 99 percent of the carbon in diesel fuel is emitted in the form of CO2 (EPA 2005). EPA published a CO2 emission factor of 10,084 grams per gallon (g/gal) or 10 kilograms per gallon (kg/gal) which provides the CO2e value. To determine the gallons of fuel used to implement the project, it was assumed that 10 percent of the construction costs are associated with fuel consumption. Based on the 10-year average, the average cost of diesel is $3 per gallon.

Using these assumptions, the Action Alternatives are expected to spend between $201,000 and $257,000 on construction which translates into between 6,700 and 8,567 gallons of fuel used, or between 67,000 and 85,670kg of CO2e for the entire construction period (2 months). The yearly emission of CO2e, NOx, and SOx for the Action Alternatives would be well below the thresholds identified by CEQ as significant and the impacts to the overall climate are negligible while the localized adverse impacts are minor and temporary. The social cost of these C02e emissions are estimated to be between $1,500 and $4,000 (computed using in 2024 dollars at Social Discount Rates of 2.5% to 1.5%) calculated using EPA's workbook for applying social GHG estimates.

The No Action alternative would likely eventually result in the failure of the Mortar Creek Rd bridge. Closing that bridge and detouring traffic onto other roads would likely result in additional vehicle emissions of C02 that would exceed the emissions of the recommended plan after about 6 months if 50 round trips of 20 miles per day (at 20 mpg) require detouring each day.

Opportunities to minimize construction related emission of GHG are limited given the relatively small size of the project; however, federal contracting processes that award

contracts to the low bidder would naturally encourage contractors to conduct the work in the most fuel-efficient manner to maximize profits. After construction is complete, all GHG emissions would cease, and the area would return to baseline conditions. Overall, the total direct and indirect adverse impacts would be constrained to very small increases in GHG emissions to the atmosphere from operation of on- and off-road mobile sources.

The operational emissions expected from the life of the Recommended Plan are expected to be minimal due to the small size and duration of the project. This project does not present opportunity to sequester GHG emissions as it will not increase wetland or forest coverage. (The construction related emissions presented above are net emissions unless under the no-action scenario the bridge is taken out of service.)

6.3 Geology

Construction activities associated with Alternative 3 would be shallow in nature and have insignificant effect on the local geology. Alternative 3 will have no impact on the local geology.

6.4 Surface Water

Construction activities associated with the Action Alternatives would have temporary direct and indirect impacts to water quality by causing an increase in river turbidity. This would have further indirect effects for a short distance downstream until the sediment is diluted. Removal of the abutments would allow the flow of water under the bridge to occur over a wider space and more similar to pre-bridge construction than under the No Action. Temporary, minor adverse effects on surface water are expected during construction with permanent beneficial effects after the project is complete.

6.5 Water Quality

Temporary localized adverse effects are expected from construction activities occurring in the river as described in section 2.1.1.4; however, turbidity conditions would return to baseline conditions after construction is complete. Stabilizing the bank would allow improved water quality by slowing or eliminating the amount of siltation and debris that sloughs into waters from storm runoff or high swift moving waters and reduce turbidity. Improving the water quality within the study area would most likely benefit the surrounding watershed. Minor, long-term beneficial effects to water quality are expected.

6.6 Floodplains

In accordance with Executive Order 11988, Floodplain Management, before conducting an action in a floodplain, federal agencies must determine there is no other practicable alternative to that action. In this case, the action cannot take place outside the floodplain.

Federal agencies are also required to minimize potential harm to or within the floodplain. The Recommended Plan would not increase the base flood elevation to a level that would violate applicable floodplain regulations or ordinances nor does it degrade the natural floodplain characteristics of the project area. Removing the abutments will promote more efficient water flow under the bridge and minimize the unnatural overbank flooding that is

experienced under the existing condition. Minor beneficial impacts to floodplains are expected.

6.7 Wetlands

Consistent with Executive Order 11990, Protection of Wetlands, the construction of the Action Alternatives would not contribute to the loss, destruction, or degradation of wetlands. The only wetlands within the project area are riverine and they would not be altered as minimal to no vegetation will be removed and the change in water flow would be beneficial as described in other sections. No impacts to wetlands are expected.

6.8 Biological Resources

Stream bank preparation would be required during implementation of the proposed alternative. Construction involves the removal of two trees and some soil removal or relocation. Any species utilizing the two trees would be have to seek other foraging, nesting, or resting habitat in the area; however, there are sufficient trees of similar size and species in the immediate area that the loss should not contribute to the injury or mortality of individuals. Noise and other disturbances associated with construction would also temporarily adversely impact terrestrial species utilizing wildlife habitats adjacent to the project site and cause individuals to avoid the area until construction is complete. Materials used for the construction of the proposed project would provide some habitat for terrestrial animals. Once established, the stone riprap toe protection for this project would provide suitable habitat for small mammals, reptiles, and birds which utilize subterranean sites for shelter.

Aquatic organisms presently utilizing shoreline or near shore habitats adjacent to the project site would be temporarily displaced. Since the desired outcome of the project would be to alter local hydraulics and the resultant erosional characteristics of the river, the aquatic species adapted to the present hydraulic regime of Mortar Creek, or near the project site, would be adversely impacted through changes in aquatic habitat. Aquatic organisms would also likely encounter temporary impacts from vibrations and noise caused by construction equipment and from activities caused by personnel on site. In addition to the water quality improvements previously identified, the proposed alternatives would provide additional beneficial impacts to fish, aquatic invertebrate, and other aquatic resources in Mortar Creek by providing substrate for colonization, feeding, spawning, and refuge.

6.8.1 Threatened and Endangered Species

Using the IPaC Consultation Package Builder and the Evaluate Determination Keys tools, the USACE determined that the activities related to the construction and implementation of Alternative 3 would have “No Effect” on Eastern black rail, Piping plover, Rufa red knot, and Northern long-eared bat. These species were shown to not have suitable habitat within or around the project area. The USFWS issued a consistency determination letter for these species on February 06, 2024, confirming the “No Effect” determination

(Appendix B). A “no effect” determination was also made for alligator snapping turtle and the monarch butterfly based on lack of suitable habitat as described in Table 15.

the project involves the removal of two trees which could provide suitable habitat for the tri-colored bat (TCB). However, the loss of habitat would be very minor and sufficient trees of similar size and species are available immediately adjacent to the two trees being removed to allow individuals to relocate. Guidance for both the TCB and the Northern long-eared bat provided by the Arkansas Fish and Wildlife Ecological Services Office suggests conservation measures and best management practices (BMPs) to minimize the impacts to both species. Those recommendations have also been incorporated into the project and include: limiting tree removal and construction to the winter months while bats are at their hibernacula, when possible, or outside the pupping season (May 15 – July 31) if work cannot be done during the winter months. Additionally, best management practices such as checking trees for cavities that the bats could use for shelter before removing them, and working with the local Fish and Wildlife office if any bats are encountered will be utilized if work occurs outside the winter months. These measures provided a basis for a no effect determination.

No consultation with the US Fish and Wildlife Service is necessary due no effect determinations made for all species.

Table 15. Effect Determinations for Listed Species

Species	Status	Effect Determination
Mammals		
Northern long-eared bat	E	No effect
Tricolored bat	PE	No effect
Birds		
Eastern black rail	T	No effect
Piping plover	T	No effect
Rufa red knot	T	No effect
Reptiles		
Alligator snapping turtle	PT	No effect
Insects		
Monarch butterfly	C	No effect

6.9 Air Quality

Construction activities associated with the Action Alternatives are expected to have only short-term impacts on local air quality. Such impacts would be primarily caused by increased emissions of carbon monoxide, hydrocarbons, and nitrous oxides from vehicles

entering and exiting the site along with the operation of necessary equipment. Vehicle travel along unpaved road surfaces and excavation of bare ground surfaces would create fugitive dust emissions. In addition to fugitive dust, project construction activities would generate tailpipe emissions from mobile heavy equipment and increased vehicular traffic. In a regional context, the daily equipment emissions associated with project construction and O&M activities, even during maximum-intensity work periods, would be minor and temporary. Impacts on air quality would not be significant.

6.10 Noise

Negligible effects from noise are expected from heavy machinery during construction. However, with the dense vegetation surrounding the project area and typical attenuation of noise as the receptor is further away from the site, the residential site is not expected to hear any construction. Noise may be noticeable by vehicles passing on the roadway but would be extremely brief and not of a decibel that would cause harm.

6.11 Cultural Resources

The USACE has consulted with the State Historical Preservation Office (SHPO), and a review of the Arkansas Historic Preservation Program's Structure Database was performed and did not indicate any previously recorded historic buildings, structures, or objects. The Recommended Plan was assessed for potential effects, as defined by 36 CFR § 800.3, in consultation with the SHPO, and appropriate Tribal Nations. Correspondence from the SHPO and Tribal Nations indicated that no historic properties would be affected pursuant to 36 CFR § 800.4(d)(1) for the Recommended Plan.

6.12 Hazardous, Toxic, and Radioactive Waste (HTRW)

No HTRW sources were identified in the project area and therefore, the Action Alternatives would have no impact to HTRW sites.

6.13 Socioeconomic and Environmental Justice

The Action Alternatives would not separate, or isolate any distinct neighborhoods, ethnic groups, or other specific groups. The CEJST showed that Faulkner County was classified as being a disadvantaged county. However, construction of the proposed project would benefit the surrounding communities by keeping the Mortar Creek Bridge from being closed and causing local traffic routes to become disrupted. There are no disproportionate impacts on any minority and/or low-income populations associated with the project. Therefore, the requirements of Executive Order 12898 (Environmental Justice) are satisfied.

6.14 Recreational Resources

Recreation Resources near the project area will temporarily be limited during construction activities. These resources are expected to become available again once construction is completed. No other impacts to Recreational Resources are expected to occur as a result of the Action Alternatives.

6.15 Best Management Practices

Final project designs and specifications will use measures to avoid and minimize impacts to natural and cultural resources. The following is a list of measures that may be used to mitigate impacts to natural and cultural resources from construction activities:

- Construction Site Planning and Management including
    - Stormwater Pollution Prevention Plans
    - Erosion, Runoff and Sediment Controls
    - Good Housekeeping and Materials Management
    - Higher Tiered heavy equipment use

6.16 Cumulative Effects

The Recommended Plan is a single and complete effort to stabilize the erosion of the bank to protect the Mortar Creek Bridge, no future impacts are expected. The completion of this project would not increase the likelihood of additional projects, infrastructure, or development within the area.

7 COMPLIANCE WITH ENVIRONMENTAL LAWS

USACE shall fully comply with all applicable Federal, State, and local environmental laws and regulations. USACE is committed to achieve, maintain, and continually improve environmental compliance performance for all Civil Works studies and projects including those in the CAP. The following is a list of applicable laws and regulations that were considered in the planning of this project (Table 16):

Table 16. Status of Compliance for Federal Environmental Laws and Executive Orders

Statue	Status	Notes
Clean Air Act of 1977	Compliant	In attainment area, See Section 6.9
Clean Water Act, as amended	Compliant	Further discussion below
Migratory Bird Treaty Act	Compliant	Further discussion below
EO 13186 Migratory Bird Habitat Protection	Compliant	Further discussion below
Endangered Species Act, Section 7	Compliant	No effect determination for all species, See Section 6.8.1
EO 11990 Wetland Protection	Compliant	See Section 6.7
Farmland Protection Policy Acts	Compliant	See Section 6.1
Floodplain Management EOs	Compliant	See Section 6.6
Federal Water Project Recreation Act	N/A	
EO 12898 Environmental Justice	Compliant	Further discussion below
EO 14008, Tackling Climate Change at Home and Abroad	Compliant	Further discussion below
National Historic Preservation Act	Compliant	See section 6.11
National Environmental Policy Act	Compliant	No significant Impacts, Draft FONSI prepared. Draft EA and Draft FONSI was made available for public review for 30 days from 24 April 2024 to 24 May 2024. No significant public comments were received.

7.1 Clean Water Act (CWA) of 1977

The Recommended Plan is in compliance with all state and Federal CWA regulations and requirements.

Section 404 of the CWA established a program to regulate the discharge of dredged or fill material into Waters of the United States (WOTUS). The project area would be considered a WOTUS due to its connection with a navigable river. As part of the proposed project,

existing bridge abutments would be removed from WOTUS resulting in a benefit by allowing more flow of water through the area in a more natural condition. However, some of the existing bank at the bridge would be excavated to widen the creek and lined with rip rap. Additionally, the four wing-walls would have rip rap stone placed below the water line resulting in fill of the WOTUS. The fill would have negligible impacts to the WOTUS by only impacting approximately 50 feet of shoreline and not permanently impact water quality or flow of water through the area. The project has been designed to minimize the amount of fill within the smallest footprint possible to successfully protect the eroding streambank. As part of Section 404, the PDT identified the TSP as the least environmentally damaging practicable alternative (LEDPA) during the NEPA process and the TSP would not result in a net loss of wetlands. No other practicable alternatives were identified due to high cost and policy constraints on development/selection of alternatives under the Continuing Authorities Program (CAP). This project meets the criteria for Nationwide Permit (NWP) No. 13: Bank Stabilization; however, a 404(b)(1) analysis and review in this EA are still required because civil works projects are not permitted to qualify for or operate under NWPs.

Under the CWA, a National Pollution Discharge Elimination System (NPDES) permit is required for any construction activities that cover 1 acre or more of land, or less than 1 acre of land, but that is part of a common plan of development or sale that will ultimately disturb 1 or more acres of land. Since the construction footprint of the project area is less than 1 acre in size and is not a part of a common plan of development or sale greater than 1 acre, a NPDES permit is not required. Should any changes to the project increase the construction area to greater than 1 acre, the contractor shall seek a NPDES permit from the ADEQ and develop a Stormwater Pollution Prevention Plan.

Section 401 of the CWA requires state water quality certifications (WQC) to ensure proposed projects will not violate state water quality standards. As efforts will take place within Mortar Creek, Section 401 and the requirement for WQC is triggered. Since the project meets the criteria of a general NWP and the project would not occur in any Extraordinary Resource Waters, Ecologically Sensitive Waterbodies, or Natural and Scenic Waterways, the project is pre-certified for Section 401 WQC and subject to general and specific conditions set by the Arkansas Department of Environmental Quality (ADEQ). The general and specific Section 401 WQC is included as Appendix B. No consultation is required.

7.2 Migratory Bird Treaty Act/ Executive Order 13186 (Migratory Bird Habitat Protection)

The Migratory Bird Treaty Act (MBTA) of 1918 extends federal protection to migratory bird species. The nonregulated “take” of migratory birds is prohibited under this Act in a manner similar to the prohibition of “take” of threatened and endangered species under the Endangered Species Act. Sections 3a and 3e of EO 13186 directs federal agencies to evaluate the impacts of their actions on migratory birds, with emphasis on species of concern, and inform the USFWS of potential negative impacts on migratory birds.

The project would remove two trees from the landscape which could support migratory birds; however, there are a sufficient number of trees of similar size and species in the immediate area that is suitable for use. The loss of nests is unlikely as all work is anticipated to be completed outside the nesting season. However, if nesting season cannot be avoided additional conservation measures would be implemented including, surveying for active nests prior to removal, avoiding removing the tree if an active nest is present, and working with US Fish and Wildlife to identify additional avoidance and minimization measures should an active nest be found. The implementation of the Recommended Plan would not result in adverse impacts on migratory birds or their habitat.

7.3 Executive Order 12898, Environmental Justice

This EO directs federal agencies to achieve environmental justice to the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review. Agencies are required to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. The Assistant Secretary of the Army Memo for Environmental Justice, paragraph 14 states that USACE will default to the CEJST as the tool for implementing and identifying EJ Communities. The CEJST showed that Faulkner County was classified as being a disadvantaged county. However, construction of the proposed project would benefit the surrounding communities by keeping the Mortar Creek Bridge from being closed and causing local traffic routes to become disrupted. The proposed project would not separate, or isolate any distinct neighborhoods, ethnic groups, or other specific groups. There are no disproportionate impacts on any minority and/or low-income populations associated with the project.

7.4 Executive Order 14008, Tackling Climate Change at Home and Abroad

This EO created the government-wide Justice 40 Initiative, which establishes the goal that at least 40 percent of the benefits of certain federal investments flow to disadvantaged communities. One hundred percent of the Federal expenditures of this project would benefit disadvantaged communities by maintain the existing travel routes and travel times of individuals in the community. The project minimizes additional burden to transportation barriers the community already experiences when compared to what would happen if the bridge fails and/or no Federal funds are expended.

7.5 Public Involvement

Public review of the draft decision document and Integrated Environmental Assessment and Draft Finding of No Significant Impact will occur concurrent with policy review. Public notices of the draft decision document will be sent out through emails, posted on social media sites, and posted on the Little Rock District website. The public review documents are available for review and download from the Little Rock District internet. No public meetings are scheduled due to the size of the project, minimal impacts anticipated, and rural nature of the project area.

8 OBLIGATIONS OF THE PARTIES

Projects implemented under Section 14 have the same project cost sharing requirement as structural flood risk management projects implemented under specific Congressional authorization. The NFS is responsible for a minimum of 35% of total project costs to a maximum of 50% of total project costs during the design and implementation phase. The NFS must pay 5 percent of total project costs in cash, provide all LERRD required for the project, perform necessary non-Federal audits, and perform investigations necessary to identify the existence and extent of hazardous substances on LER required for the project. The NFS required share determined above could increase if the Federal costs of planning, design, and implementation for the project exceed the statutory Federal per-project participation limit for this authority and the NFS agrees to contribute funds for any costs that would normally be part of the Federal share but are over the per-project limit.

Federal implementation of the project will be subject to the execution of a binding Project Partnership Agreement (PPA). The appropriate model PPA will be used unless a deviation is approved by the appropriate USACE authority.

9 DISTRICT ENGINEER'S RECOMMENDATION

I recommend the emergency streambank plan as generally described in the FINAL Detailed Project Report and Integrated Environmental Assessment, be implemented under the authority of Section 14 of the Flood Control Act of 1946, as amended, Emergency Streambank and Shoreline Protection, with such modifications as are within the discretion of the appropriate authority may be deemed advisable. The project first cost is currently estimated to be $441,000.

Prior to the commencement of construction, local interests must agree to meet the requirements of Local Sponsor responsibilities as outlined in this report and future legal documents. Faulkner County, Arkansas has demonstrated that they have the authority and financial capability to provide all Local Sponsor requirements for the implementation, operation and maintenance of the project. The recommendations contained herein reflect the information available at the time and current Department of the Army policies governing formulation, evaluation and development of individual projects under the US Army Corps of Engineers Continuing Authorities Program.

DATE

Damon M. Knarr
COL, EN
Commanding

10 REPORT PREPARERS

The project delivery team and their technical specialties are shown below (Table 17). Each was primarily responsible for the feasibility level study tasks and report preparation.

Table 17. Report Preparers

NAME	TECHNICAL DISCIPLINE
Tyler Mays	Project Management
Phil Hejduk	Plan Formulation
Chris Beckley	Economics
Joshua McLarty	Hydrology and Hydraulic Engineering
Chris Davies	Cultural Resources
Brandon Ford	Environmental Resources
Kylie Fahmer	HTRW
Robert Sunta	Civil Engineering
Kathleen Hoffman	Cost Engineering
Paige Lott	Real Estate

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