



**DEPARTMENT OF THE ARMY**  
**U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT**  
**1222 SPRUCE STREET**  
**ST. LOUIS, MISSOURI 63103-2833**

03 February 2020

**Reply to:**

U.S. Army Corps of Engineers  
St. Louis District  
Environmental Compliance Section (PD-C)  
1222 Spruce Street  
St. Louis, MO 63103-2833

Dear Sir or Madam:

The St. Louis District, U.S. Army Corps of Engineers has prepared a draft Environmental Assessment (EA) with unsigned Finding of No Significant Impact (FONSI) to evaluate the raise/relocation of a 1.6 mile section of Highway D at Wappapello Lake, Missouri.

Under the National Environmental Policy Act of 1969, as amended, the St. Louis District is distributing this letter to notify concerned agencies, interest groups, and individuals of the proposed project and to solicit comments from those persons or organizations who may be interested in or affected by the project. The FONSI is unsigned and will only be signed after comments received as a result of this public review have been considered. The electronic version of draft EA and unsigned FONSI are available online at:

<https://www.mvs.usace.army.mil/Portals/54/docs/pm/Reports/EA/WappapelloLakeHwyDEA.pdf>

The St. Louis District of the U.S. Army Corps of Engineers is proposing to raise a 1.6 mile section of Highway D to an elevation of 405 feet in order to reduce flood risk and subsequent road closure of Highway D. In addition, road safety would be improved in this area by straightening curves that were a concern for local residents. Environmental impacts associated with the proposed project are outlined in the draft EA.

Please provide any comments you may have regarding this project to Dr. Alison Anderson of the Environmental Compliance Section, at **telephone** 314-331-8458 or **e-mail** at [Alison.M.Anderson@usace.army.mil](mailto:Alison.M.Anderson@usace.army.mil). Written comments may be sent to the address above, ATTN: Environmental and Planning Branch (PD-C, Anderson). In order for comments to be considered prior to a final decision being made, they must be received by this office by close of business on 04 March 2020.

Sincerely,

A handwritten signature in blue ink, reading "Teri C. Allen".

Teri C. Allen, Ph.D.  
Chief, Environmental Compliance Section

**Draft Environmental Assessment  
with  
Finding of No Significant Impact (FONSI)**

**Wappapello Lake Highway D Road Relocation Project  
Wayne County, Missouri**

**February 2020**

**U.S. Army Corps of Engineers  
St. Louis District  
Regional Planning & Environmental Division North  
1222 Spruce Street  
St. Louis, Missouri 63103-2833  
Telephone Number: (314) 331-8458**

## Table of Contents

<b>1</b>	<b>Purpose of and Need for Action</b>	<b>1</b>
1.1	Introduction	1
1.2	Purpose and Need	1
1.3	Scoping Summary	2
1.4	Summary of Prior Actions and Authority	2
<b>2</b>	<b>Alternatives Including the Proposed Action</b>	<b>2</b>
2.1	No Action Alternative	3
2.2	West Alternative	3
2.3	East Alternative	3
<b>3</b>	<b>Affected Environment</b>	<b>4</b>
3.1	Topography, Geology, and Soil	4
3.2	Prime and Unique Farmland	4
3.3	Hydrology	5
3.4	Wetlands and Aquatic Habitats	6
3.5	Water Quality	7
3.6	Recreation and Aesthetics	8
3.7	Land-use	9
3.8	Fish and Wildlife	10
3.9	Threatened and Endangered Species	10
3.10	Bald and Golden Eagle	12
3.11	Historic and Cultural Resources	12
3.12	Tribal Resources	14
3.13	Socioeconomics and Transportation	14
3.14	Hazardous, Toxic, and Radioactive Materials	15
3.15	Air Quality and Noise	16
<b>4</b>	<b>Environmental Consequences</b>	<b>17</b>
4.1	Topography, Geology, and Soil	18
4.2	Prime and Unique Farmlands	18
4.3	Hydrology	19
4.4	Wetlands and Aquatic Habitats	20
4.5	Water Quality	20
4.6	Recreation and Aesthetics	21

4.7	Land-use	21
4.8	Fish and Wildlife	22
4.9	Threatened and Endangered Species	23
4.10	Bald and Golden Eagle	24
4.11	Historic and Cultural Resources	24
4.12	Tribal Resources	24
4.13	Socioeconomics and Transportation	24
4.14	Hazardous, Toxic, and Radioactive Materials	25
4.15	Air Quality and Noise	25
5	Environmental Justice	26
6	Climate Change	27
7	Cumulative and Adverse Impacts	28
7.1	Cumulative Effects Overview	28
7.2	Scoping for Cumulative Effects	29
7.3	Cumulative Effects by Resource	32
8	Evaluation & Comparisons of Alternatives	33
9	Public Review	37
10	Environmental Compliance	38
11	List of Preparers	39
12	Works Cited	40
FINDING OF NO SIGNIFICANT IMPACT		42
Appendix A – Coordination		44

**Draft Environmental Assessment**  
**Wappapello Lake Highway D Road Relocation Project**  
**Wayne County, Missouri**  
**February 2019**

## **1 PURPOSE OF AND NEED FOR ACTION**

### **1.1 INTRODUCTION**

Wappapello Lake is located in Wayne and Butler counties on the Upper St. Francis River in the southeastern part of Missouri, approximately 22 miles southeast of Greenville, Missouri, and 16 miles northeast of Poplar Bluff, Missouri. Wappapello Lake is an 8,400-acre lake created in 1941 by damming the St. Francis River with the Wappapello Dam. The Lake is owned and operated by the U.S. Army Corps of Engineers (USACE) and provides flood control for the St. Francis River and its tributaries, recreation, and fish and wildlife conservation. USACE operates and maintains Wappapello Lake as a flood control and recreational reservoir as part of the Wappapello Lake Project, which includes the Lake and all lands surrounding the Lake used as part of Lake operations. The dam site is located at the edge of the Ozark Plateau hill country and the reservoir is long and narrow with coves developed in the tributary streams. Since the construction of Wappapello Lake and Dam in 1941, increases in precipitation frequency and duration, despite modifications to the Water Control Plan (USACE, 2016), have contributed to more frequent flooding in areas adjacent to the lake and its tributaries.

### **1.2 PURPOSE AND NEED**

During periods of high lake water levels, a 1.6 mile section of Missouri Highway D becomes inundated by flood waters resulting in its closure. Missouri Highway D is a primary north-south transportation corridor that lies to the east of Wappapello Lake. In order to prevent the inundation, and subsequent closure, of Missouri Highway D, USACE and Missouri Department of Transportation (MODOT) are proposing to redesign the 1.6 mile section of highway to a minimum elevation of 405 feet NAV88. The primary purpose of the road redesign project is to prevent the

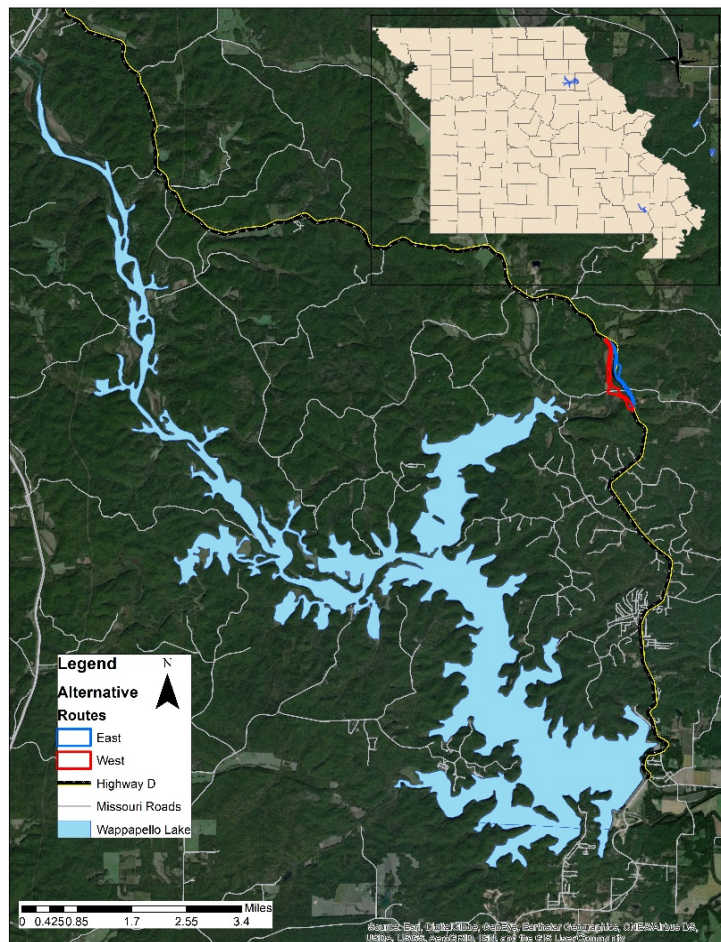


Figure 1. The Project Area along Highway D is located to the east of the Wappapello Lake within Wayne County, Missouri.

flooding of Missouri Highway D within the section identified (Figure 1) in order to keep the roadway open despite seasonal flooding events. A secondary purpose is to allow greater flexibility in the ability of the Wappapello Lake Project to regulate water levels and reduce flooding downstream of the dam as outlined in the Water Control Plan.

### **1.3 SCOPING SUMMARY**

On 15 July, 2019, MODOT and USACE held a joint public scoping meeting at the Wappapello Lake Visitors Center. During the meeting, visitors were encouraged to voice any concerns and discuss the overall road raise/relocation with the project team. In addition, the two Action Alternatives discussed below were presented to aid discussion and help identify locally important resources. Resources that were identified during the scoping meeting included: aesthetics; alternate transportation routes and road closures; road safety; and flooding and Wappapello Lake water level management.

### **1.4 SUMMARY OF PRIOR ACTIONS AND AUTHORITY**

Wappapello Lake Project was originally authorized for construction by the Flood Control Act of 1936. Authorization for recreational development was added in 1944, three years post lake and dam construction completion in 1941.

Congressman Emerson, representing the 8<sup>th</sup> District of Missouri, obtained funds to study and initiate construction on 20 sites where the road network was flooded. This authorization is contained in the Energy and Water Development Appropriations Act of 1992. Section 9 of the Flood Control Act of 1946 gives the Chief of Engineers the authority to relocate, restore or protect highways which are being damaged by the operation of the project.

In 1995, a Wappapello Lake Project-wide Environmental Assessment (EA) was completed by USACE, which included the evaluation of 20 identified locations on state or county roads adjacent to Wappapello Lake affected by high water events. These locations previously affected or closed by high lake water levels were analyzed for possible alterations and or relocation actions. The Highway D road relocation was included in the 1995 analysis, however, implementation was never completed due to insufficient funding and difficulty in designing an alternative to avoid sensitive aquatic habitats. Only one action alternative was evaluated within the 1995 EA associated with the Highway D portion.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality's Regulations (40 Code of Federal Regulations §1500-1508, as reflected in the USACE Engineering Regulation 200-2-2). This EA evaluates the direct, indirect, and cumulative environmental, cultural, and social effects of the proposed Wappapello Lake Highway D Road Relocation Project.

## **2 ALTERNATIVES INCLUDING THE PROPOSED ACTION**

This section of the EA describes the alternatives considered and summarizes the alternatives in terms of their environmental impacts and their achievement of objectives. Two Action Alternatives (Relocation Alternatives) were developed by identifying construction measures to elevate the road surface to a minimum elevation of 405 feet. A No Action Alternative is also considered for the project area.



## 2.1 NO ACTION ALTERNATIVE

Under No Action, USACE and MoDOT would neither raise nor relocate a 1.6 mile section of Missouri Highway D. The current conditions as described below would continue. See Chapter 3 (Affected Environment) for a more detailed profile of the current environmental conditions of the project area.

Seasonal flooding and elevated water levels are expected to continue to inundate Highway D, which would continue to impact traffic patterns due to road closure and detours. Streams, lakes, and wetlands may be negatively impacted due to continued flooding events inundating the roadway and carrying the salt, oils, and other chemicals into the water system through the tributaries to East Fork Lost Creek and on to Wappapello Lake. In addition, more frequent flooding of Highway D would require more frequent maintenance, which often requires temporary lane closures resulting in increased traffic congestion.

USACE would continue to control lake water levels according to the Wappapello Lake Water Control Manual (USACE, 2016).

Road safety along this section of Missouri Highway D would continue to be a safety concern for residents and visitors to Wappapello Lake due to its substandard horizontal (i.e., sharp curves) and vertical (i.e., steep embankments) alignments.

## 2.2 WEST ALTERNATIVE

The West Alternative would relocate Highway D approximately 500 to 1,000 feet west of the current alignment throughout the project area (Figure 2). The new alignment would require the construction of a new road embankment approximately 60 feet tall and 180 - 240 feet wide at the base and would run primarily through existing agricultural fields. This alternative would require four new stream crossings and would permanently impact 0.60 acres of wetlands and 14 acres of forest. To offset the unavoidable impacts to aquatic resources, wetland mitigation credits and stream mitigation credits would be purchased from a wetland mitigation bank and Missouri in-lieu fee program, respectively.

## 2.3 EAST ALTERNATIVE

The East Alternative would relocate Highway D approximately 100 feet to the west of the current road at the northern end of the project area and approximately 200 feet to the east of the current road in the center of the project area, and would use the existing alignment when possible.

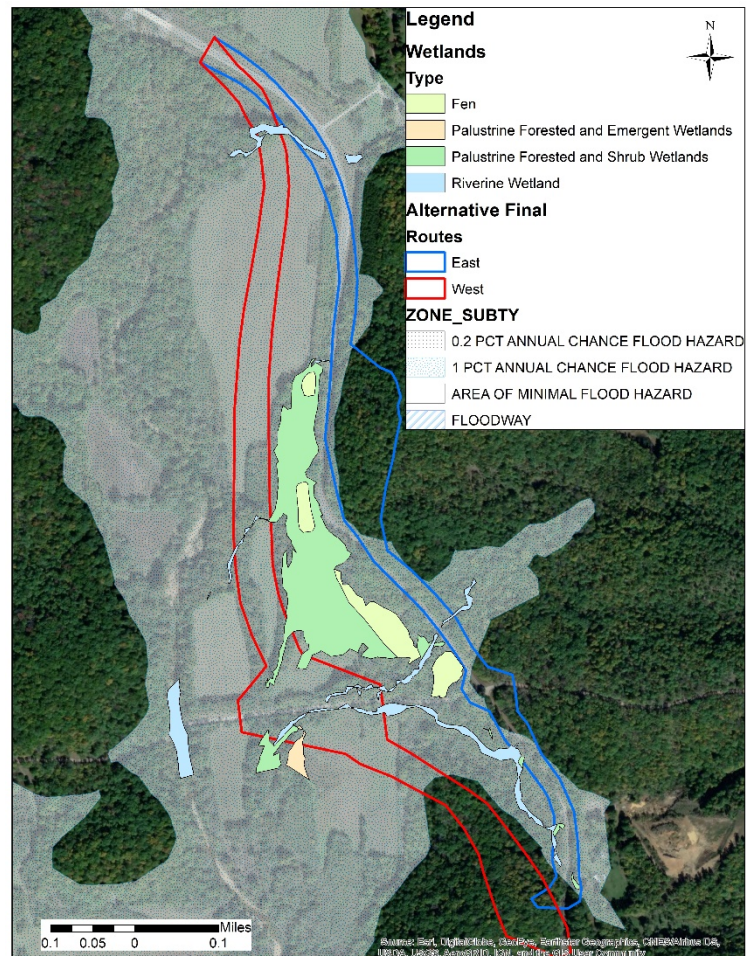


Figure 2. The West Relocation alternative (red) would relocate Highway D approximately 500 to 1,000 feet west of the current alignment throughout the project area. The East Relocation alternative would relocate Highway D approximately 100 feet to the west of the current road at the northern end of the project area and approximately 200 feet to the east of the current road in the center of the project area, and would use the existing alignment when possible.

approximately 200 feet to the east of the current road in the center of the project area (Figure 2). This alternative would alleviate the sharp turns on the existing roadway while using the existing road embankment when possible. This alternative would require the extension of one existing stream crossing and would use two existing stream crossings. In addition, this alternative would permanently impact 0.11 acres of wetlands and 13.3 acres of forest. To offset the unavoidable impacts to aquatic resources, wetland mitigation credits and stream mitigation credits would be purchased from a wetland mitigation bank and Missouri in-lieu fee program, respectively.

### **3 AFFECTED ENVIRONMENT**

This section describes existing conditions in the proposed project area, which are referred to under the NEPA process as the Affected Environment. The resources described in this section are those recognized as significant by laws, executive orders, regulations, and other standards of national, state, or regional agencies and organizations; technical or scientific agencies, groups, or individuals; and the general public.

#### **3.1 TOPOGRAPHY, GEOLOGY, AND SOIL**

Wappapello Dam is located on the divide of the high-relief Ozark Plateau and the low-relief Mississippi Alluvial Plain. Wappapello Lake and the project area lie within the Ozark Plateau hill country. According to the Missouri Department of Conservation (MDC), subdivisions of the Ozark Plateau include the St. Francois Mountains and the dissected Salem Plateau regions. The St. Francis River that flows through Wappapello Lake has cut a wide valley some 300 to 350 feet below the dissected uplands. The surrounding slopes are 20 to 35 percent and forested. The Ozark Plateau is dominated by Precambrian igneous rock in the St. Francois Mountains, followed in a downstream direction by sandstone and hard Cambrian dolomites. Eventually, cherty Ordovician dolomite becomes the primary underlayment adjacent to Wappapello Lake.

#### **3.2 PRIME AND UNIQUE FARMLAND**

Prime and unique farmland is important in meeting the Nation's short- and long-range needs for food and fiber. Prime farmland soils, as defined by the U.S. Department of Agriculture (USDA), are soils that are best suited for food, feed, forage, fiber, and oilseed crops. Prime farmland soils may presently be used as



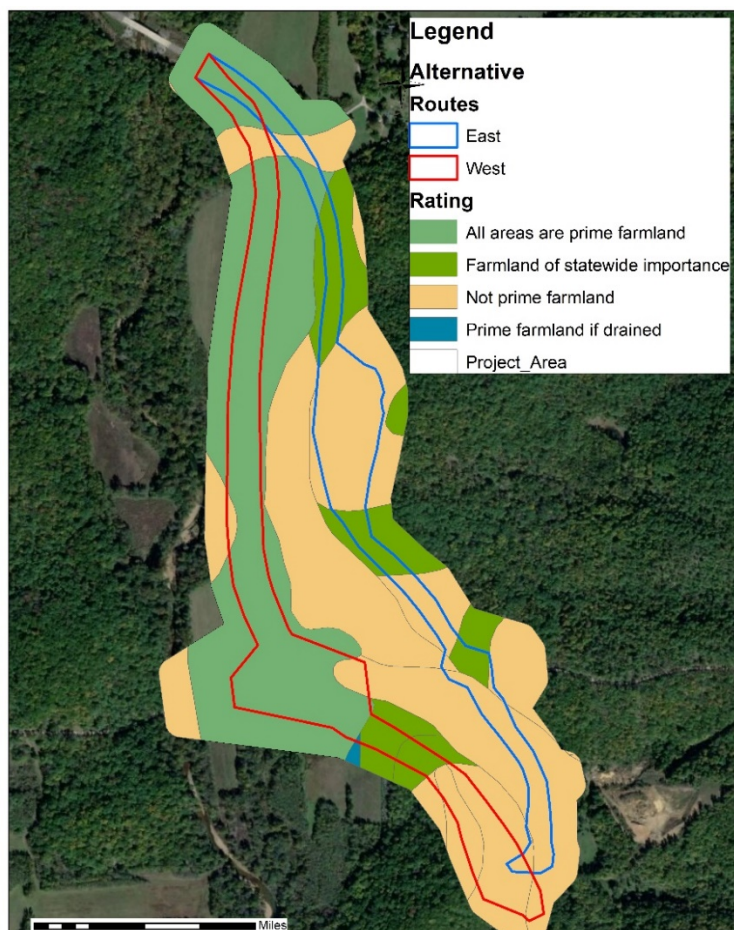


Figure 3. According to the Natural Resource Conservation Service (NRCS), USDA, Web Soil Survey, various prime farmland soil types occur within the project area

cropland, pasture, forestland, or for other purposes. Soils that have a high-water table, are subject to flooding, or are droughty may qualify as prime farmland where these limitations are overcome by drainage measures, flood control, or irrigation. The USDA uses the following characteristics to classify prime farmland soils:

- Adequate and dependable supply of moisture from precipitation or irrigation.
- Temperature and growing season are favorable.
- Level of acidity or alkalinity and the content of salts and sodium are acceptable.
- Few, if any, rocks and permeable to water and air.
- Not excessively erodible or saturated with water for long periods, and they are not frequently flooded during the growing season or are protected from flooding.
- Slopes range mainly from 0 to 6 percent.

According to the Natural Resource Conservation Service (NRCS), USDA, Web Soil Survey, various prime farmland soil types occur within the project area's

176.2 acres (Figure 3). Just over half (50.1%) of the project area is defined as "not prime farmland" totaling 88.5 acres. Prime farmland account for 66.1 acres (37.5%) of the soils within the project area. There are 0.3 acres of soils that could be "prime farmland if drained" (0.2%) and the remaining 21.3 acres include "farmland of statewide importance" (12.1%). However, approximately 35 acres within the project area is actively being used as pasture/hay land. Most of the remaining project area is forested with terrain that is not conducive to farming.

### 3.3 HYDROLOGY

Wappapello Dam and Lake are located on the divide of the St. Francis Basin with the upper sub-basin upstream of the Dam and the lower sub-basin downstream of the Dam. Throughout history, this area has been subject to periodic floods, with most of the flood damage confined to agricultural areas. The predominance of impervious rock in the upper basin limits infiltration and subsurface flows causing rapid runoff, flashy hydrographs, frequent flooding, and a poor aquifer that provides low, unstable base flows. The proposed project area is mostly within the 100-year floodplain (Figure 4).

Wappapello Lake was constructed in 1941 as a flood control reservoir. Water elevation levels in Wappapello Lake are altered based on seasonal, local, and regional weather conditions. The changes in

water level elevations are outlined in the Water Control Plan for Wappapello Lake (USACE 2014). Typically, Lake levels are between 354 feet (Conservation Pool) and 394 feet (Flood Control Pool). The Lake has capacity to hold up to 394.74 feet before the spillway is overtopped. Even with recent modifications to the Water Control Plan, increases in precipitation frequency and duration have contributed to more frequent flooding in areas adjacent to the Lake and its tributaries. Missouri Highway D within the project area becomes inundated with water from Wappapello Lake at water elevations of 389 feet and greater.

### 3.4 WETLANDS AND AQUATIC HABITATS

Wetlands are areas where the frequent and prolonged presence of water at or near the ground surface dictates the kinds of soils that form, the plants that grow, and the fish and/or wildlife that use the habitat. Wetland habitats are important ecosystems because they provide flood control and storm barriers. Wetlands are sometimes called “nature’s kidneys” due to their ability to absorb and filter out harmful chemicals and pollutants from aquatic systems.

Under Section 404 of the Clean Water Act, wetlands are a protected habitat type and the alteration, or destruction, of wetlands requires mitigation. The National Wetland Inventory (NWI) identified two wetland types (i.e., forested/shrub and riverine wetlands) within the project area. According to the NWI, approximately 3.45 acres and 2.60 acres of forested/shrub and riverine wetlands, respectively, are within the project area.

Despite being a useful preliminary site evaluation tool, desktop delineations often significantly underestimate the total number/extent of streams and wetlands actually

present or incorrectly characterize the type of wetland(s) present. Therefore, stream and wetland systems within the project area were delineated in the field. The field delineation was completed from October 15 to October 19, 2018. The field delineation confirmed freshwater-forested-shrub wetlands as mapped by the NWI. The field delineation identified an additional seven vegetated wetlands not mapped by NWI. Between NWI and field delineation, total wetland area within the project area is approximately 20.36

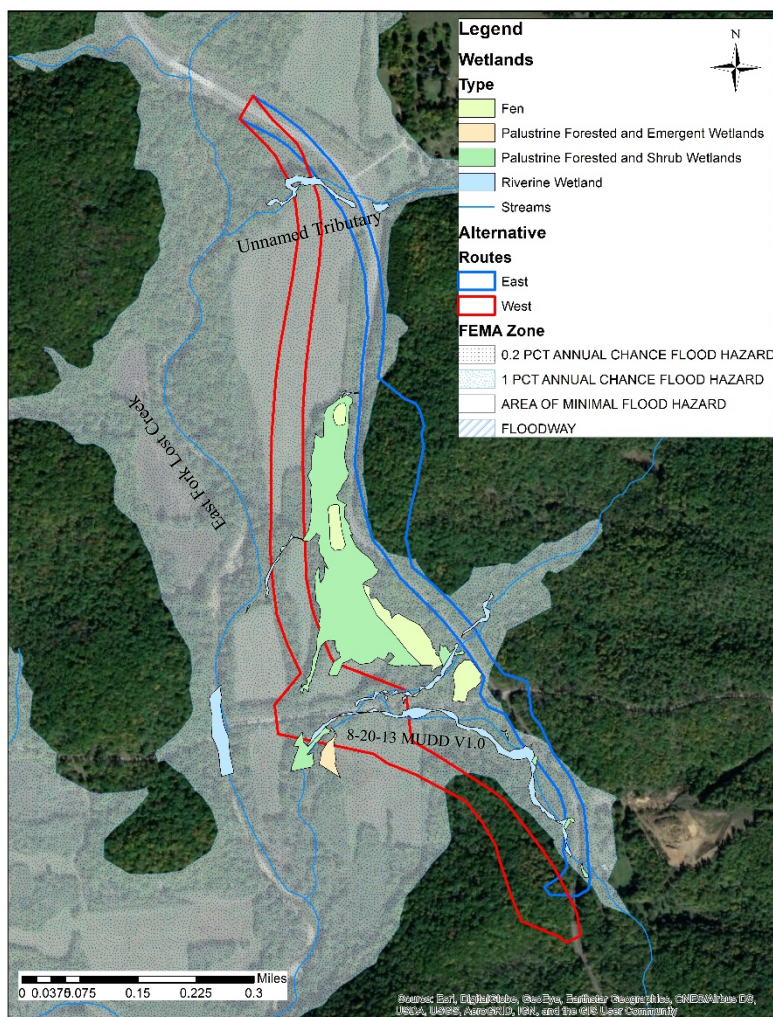


Figure 4. Wetlands and aquatic habitats occur throughout the project area. Within the central wetland complex, rare fens can be found.

acres (Figure 4).

There is a wetland fen, approximately two acres, that occurs in the center of the project area within the larger wetland complex (Figure 4). Fens are a rare type of wetland that receive nutrients from sources other than precipitation, usually from upslope sources via groundwater movement and drainage from surrounding mineral soils. Fens can support diverse plant and animal communities due to being less acidic and having higher nutrient levels than other wetland types. Fens provide important benefits in a watershed including providing habitat for unique plant and animal communities, improving water quality, and helping to prevent or reduce the risk of flooding. The fen is vegetated by willows (*Salix sp.*), common buttonbush (*Cephalanthus occidentalis*), red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), spotted jewelweed (*Impatiens capensis*), sedges (*Carex sp.*), and ferns including royal fern (*Osmunda spectabilis*). A detailed description of the wetlands within the project area are outlined in the Wetlands Delineation Report (CDM Smith, 2019a), which is available upon request.

The project area also has three streams that have been classified by the Missouri Department of Natural Resources (MDNR) as either class P (i.e., streams that maintain permanent flow even in drought periods) or class C (i.e., streams that may cease flow in dry periods but maintain permanent pools which support aquatic life). East Fork of Lost Creek (Figure 4) is a class P stream with gravel/cobble substrate and slow to small riffle flow that flows north to south along the western edge of the project boundary and converges with Wappapello Lake approximately 0.67 miles southwest of the project limits. An unnamed tributary to East Fork of Lost Creek is a class C stream that flows from east to west across the northern project limits and converges with East Fork of Lost Creek just outside of the northwestern boundary of the project limits. This intermittent stream ceases flow during the dry months and has a gravel/cobblestone substrate. Another unnamed class C stream identified by MDNR as 8-20-13 MUDD V1.0 winds through the southern portion of the project flowing from east to west and converges with East Fork of Lost Creek just south of the project boundary. This stream is also an intermittent stream with a gravel/cobblestone substrate and ceases flow during the dry months.

The streams and tributaries within the project area ultimately flow into Wappapello Lake, which is located approximately 0.67 miles southwest of the project limits. Wappapello Lake is an 8,400-acre lake created in 1941 by damming the St. Francis River. This lake is owned and operated by the USACE and provides flood control for the St. Francis River and its tributaries, recreation, and fish and wildlife conservation.

### 3.5 WATER QUALITY

Missouri Department of Natural Resources developed water quality standards for all waterbodies. The level of protection for a waterbody is dependent on the expected, or designated, use assigned to that stream, lake, or river. The East Fork of Lost Creek has use designations for: general warm-water fishery, irrigation, livestock and wildlife protection, secondary contact recreation, whole body contact recreation, and human health and protection. The unnamed tributary to East Fork of Lost Creek has use designations for: general warm-water fishery, irrigation, livestock and wildlife protection, secondary contact recreation, whole body contact recreation, and human health and protection. Another unnamed stream at the southern end of the project area has use designations for: general warm-water fishery, irrigation, livestock and wildlife protection, secondary contact recreation, whole body contact recreation and human health and protection. All three streams within the project limits meet the water quality standards set by



Section 303(d) of the Federal Clean Water Act and are not on Missouri's 303(d) list of impaired waterbodies (MDNR, 2018). See Section 3.7 – Wetlands and Aquatic Habitats for a detailed description of all aquatic habitats within the project area.

A routine annual water quality monitoring and investigation program is in place and managed by the USACE at all five lakes under the St. Louis District's control. Water quality sampling is conducted within all five lakes and their tributaries to establish trend analysis and to maintain water quality at or above state and Federal regulation. The water quality monitoring program was conducted during 2019 to assure that safe conditions were maintained for human recreation, wildlife, and aquatic life. The sampling sites within Wappapello Lake and the vicinity include the following: WAP-1 Spillway, WAP-2 lake side of dam, WAP-5 Otter Creek, WAP-6 Greenville, WAP-7 Hwy 34 bridge, and four marinas. Four water quality sampling events took place during 2019, between April and October. Generally, the water collected at Wappapello Lake, tributaries and tailwater stay within Missouri water quality standards for primary and secondary water contact recreation, which include swimming, boating, fishing and water skiing (USACE, 2015). During the 2019 sampling season, the following exceedances were observed: iron, manganese, phosphorus, and total suspended solids. Even though phosphorous levels routinely exceed Missouri water quality standards, discharge from the Lake generally has lower concentrations of phosphorous than the incoming tributary flows.

Highway runoff can contain a cocktail of more than 30 substances (Brien et al., 2006). The impact of those pollutants on adjacent waterbodies can depend on the traffic on the road, drainage systems, and the surrounding hydrologic conditions. For example, some roadways near sensitive habitats can impact the organisms living in those sensitive habitats due to an increase in chloride concentrations (Collins and Russell, 2009). Within the project area, Highway D is occasionally treated with chemicals during the winter months and also builds up minerals and salts as a result of regular use. In the spring months when Wappapello Lake levels are high, Highway D can become flooded. When water washes over the roadway for extended periods of time, chemicals on the road surface can be transported into nearby streams and wetlands, and into Wappapello Lake. Continued inundation of Highway D could lead to a decrease in water quality in the nearby streams and fens, a sensitive aquatic habitat.

### **3.6 RECREATION AND AESTHETICS**

Recreation opportunities within the project area are primarily hunting, fishing, swimming and site seeing. Wildlife is abundant throughout the Wappapello Lake Project providing visitors ample opportunities to seek game species regulated by MDC. The East Fork of Lost creek located on the western edge of the project area offers anglers the opportunity to wade fish. The cool clear stream also provides visitors the ability to cool off during the hot summer months. Finally Corps of Engineers Road 9 is an aesthetically pleasing road that is often used for a Sunday drive. Visitors use this roadway as a cut through road to get away from the daily highway hustle. Along this roadway are agricultural fields, streams, lake access, wetlands, and wooded areas.

Aesthetic resources are natural and human environments that are pleasing or pleasant for people to look at and visually enjoy. For many people the aesthetic resources include the natural channel of the East Fork Lower Creek, undeveloped open space such as agricultural lands, natural habitats, and to a lesser extent a residential area. The Highway D project area is entirely undisturbed open space, other than the existing Highway D roadway and intersecting roadways/driveways (Figure 5). The uninterrupted forests and undeveloped areas used as farmland are present in the project area.



Figure 5. The area surrounding Highway D is natural with little human development.

### 3.7 LAND-USE

According to the 2016 National Land Cover Database (Yang et al., 2018), much of the project areas 176 acres is a mix of pasture, open space development (roadways), and deciduous forest (Table 1; Figure 6). In the northern portion of the project area there are small pockets of developed, low-intensity land, which accounts for the two single-family houses in that area.

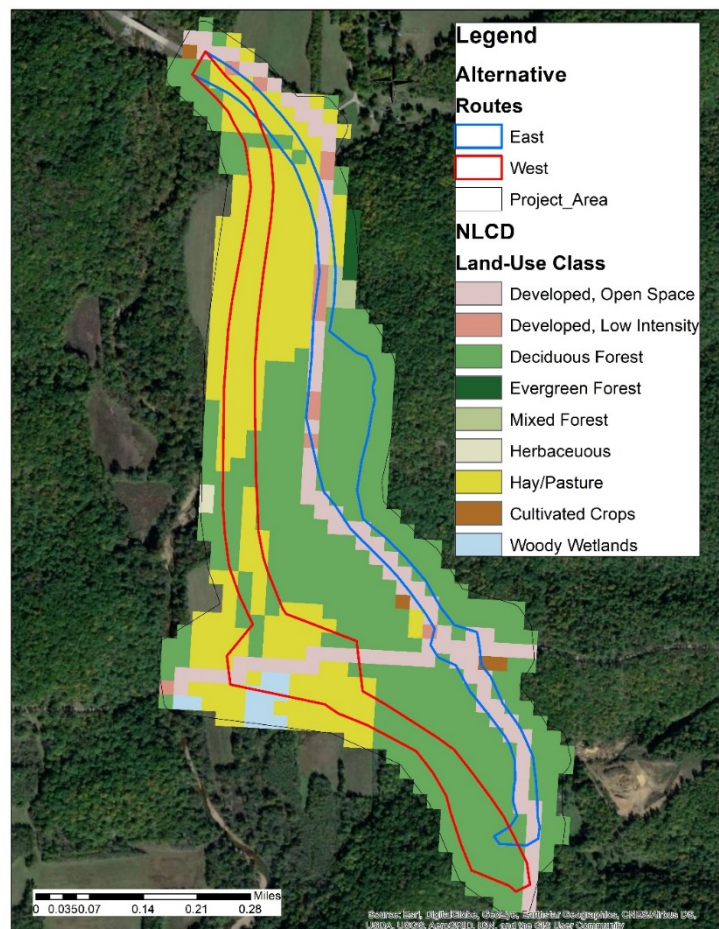


Figure 6. National Land Cover Database land use within the project area show that the area is forested with some development and pasture.

**Table 1.** Land-use types within the project area is a mixture of forests, pasture, and development according to the 2016 National Land Cover Database.

Land Type	Acres	Percent
<b>Developed, Open Space</b>	23.13	13.1%
<b>Developed, Low Intensity</b>	2.89	1.6%
<b>Deciduous Forest</b>	91.18	51.8%
<b>Evergreen Forest</b>	1.11	0.6%
<b>Mixed Forest</b>	1.11	0.6%
<b>Herbaceous</b>	0.44	0.25%
<b>Pasture/Hay</b>	52.48	29.8%
<b>Cultivated Crops</b>	0.89	0.5%
<b>Woody Wetlands</b>	2.67	1.5%
<b>Total</b>	<b>175.9</b>	<b>100%</b>

### 3.8 FISH AND WILDLIFE

Lands within the USACE Wappapello Lake boundary are classified based on how the land will be managed. The project area contains two land classes, Vegetative Management Area and Environmentally Sensitive Area. Definitions of the land classifications and their associated management objectives are outlined in the Wappapello Lake Master Plan (USACE, 2019).

Common terrestrial species in the project area include white-tailed deer, coyotes, gray and red fox, bobcats, skunks, river otters, weasels, minks, opossums, eastern cottontail rabbits, eastern gray and fox squirrels, chipmunks, beavers, muskrats, eastern wild turkeys, bobwhite quail, as well as several mouse, bat, and other species. Several species of birds are also common in and around the project area. Common bird species for the area include raptors, songbirds, and waterfowl.

The project area has limited year around habitat for aquatic organisms within the project area. The only stream within the project area capable of supporting fish species would be the East Fork of Lost Creek. Common fish for slow moving waterways around the project area would include minnows, chubs, and darters. Just downstream of the project area is Lake Wappapello. During times of high waters, fish from the lake could swim upstream to the project location. Common fish in Lake Wappapello include white and black crappie, largemouth bass, white bass, bluegill, redear sunfish, warmouth, green sunfish, longear sunfish, channel catfish, and flathead catfish.

### 3.9 THREATENED AND ENDANGERED SPECIES

#### 3.9.1 State Listed Species

In accordance with the Section 401 Water Quality Certification from the State of Missouri, the proposed project should take into consideration impacts to state listed threatened and endangered species.

MDC was contacted via the Missouri Heritage Review website on 23 August 2019, for a list of Missouri State threatened and endangered species that could potentially be located in the project areas (MDC



project number: 6155; Appendix A). The Missouri Natural Heritage Database generated a Level Three Report due to three State and Federally-listed bat species in the project vicinity (see Section 3.8.2- Federally Listed Species). In addition, there are numerous State species and communities of conservation concern in the project vicinity as well. MDC has specific concerns over the nearby Ozark fens, known as Hattie's Ford Fens. MDC has requested additional consultation on the road designs to minimize impacts to these fens as well as work with construction staff onsite to discuss minimization and avoidance solutions.

### 3.9.2 Federally Listed Species

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973 (as amended), federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species.

The U.S. Fish and Wildlife Service (USFWS) was contacted via USFWS Information for Planning and Consultation (IPaC) website on 8 August 2019 and 27 January 2020, for a list of Federal threatened, endangered and candidate species (Appendix A) that could potentially be located in the project area (Consultation Code: 03E14000-2019-SLI-2587 and Event Code: 03E14000-2019-E-06030; Table 2).

Table 2. List of federally listed threatened and endangered species potentially occurring within the proposed project area.

Common Name	Scientific Name	Listing Status	Habitat
<b>Gray bat</b>	<i>Myotis grisescens</i>	Endangered	Roost in caves or mines; Forage and travel near water features and forested riparian corridors
<b>Indiana bat</b>	<i>Myotis sodalis</i>	Endangered	Hibernate in caves or mines during winter (November 1 – March 31); Roost in forest and woodland habitats (April 1 – October 31)
<b>Northern long-eared bat</b>	<i>Myotis septentrionalis</i>	Threatened	Hibernate in caves or mines during winter (November 1 – March 31); Roost in forest and woodland habitats and human-made structures (April 1 – October 31)

**Gray bat** (*Myotis grisescens*) has been listed as endangered by the USFWS since April 28, 1976 and is still in danger of extinction throughout all or a significant portion of its range. Typically, gray bats roost in caves year-round, with most wintering caves being vertical and deep. During the spring and fall transient periods, a much wider variety of cave types are used. During the summer, maternity colonies prefer caves that provide restricted rooms or domed ceilings that act as warm air traps. Recent bat monitoring efforts conducted by USACE and the U.S. Forest Service have detected gray bats near the project area. It is unknown if a hibernaculum is present within the project area since gray bats can travel several miles from their hibernacula to feed.

**Indiana bat** (*Myotis sodalis*) has been listed as endangered by the USFWS since March 11, 1967 and is still in danger of extinction throughout all or a significant portion of its range. During the winter, Indiana bats roost in mines or caves with stable, cold but not freezing temperatures. During summers they typically roost in the exfoliating back of live or dead trees. Recent bat monitoring efforts conducted by

USACE and the U.S. Forest Service have detected Indiana bats within the northern portion of the project area.

An on-site investigation was made at the project area October 22 to 23, 2018 to determine the potential for summer roosting habitat for Indiana and northern long-eared bats by two CDM Smith biologists. The area was broken into 19 transects and inspected for either live or dead trees with exfoliating bark that were larger than 9" diameter at breast height (DBH). The biologists walked transects and noted the size and species of any trees with the possibility of being a summer bat roost tree. Six transects were classified as non-forested unsuitable habitat and were not inspected. Of the 13 forested transects, 11 had trees suitable for summer roosting. A detailed description of the bat habitat within the project area is outlined in the Threatened and Endangered Species Technical Memo (CDM Smith, 2019b), which is available upon request.

**Northern long-eared bat** (*Myotis septentrionalis*) has been listed as threatened by the USFWS since April 2, 2015 and is likely to become endangered within the near future throughout all or a significant portion of its range. Over the winter, they typically hibernate in small crevices or cracks within caves and mines with no air currents, high humidity, and constant temperatures. During summers northern long-eared bats roost singly or in colonies underneath exfoliating bark, in crevices, or in cavities of both live and dead trees.

### **3.10 BALD AND GOLDEN EAGLE**

Bald eagles (*Haliaeetus leucocephalus*) winter along the major rivers of Illinois and Missouri, and at scattered locations some remain throughout the year to breed. Perching and feeding occurs along the edge of open water, from which eagles obtain fish. The bald eagle was removed from the List of Endangered and Threatened Species in August 2007, but it continues to be protected under the Bald and Golden Eagle Protection Act and by the Migratory Bird Treaty Act. Recommendations to minimize potential project impacts to the bird and nests are provided by the USFWS in the agency's National Bald Eagle Management Guidelines publication (USFWS, 2010). The guidelines recommend: (1) maintaining a specified distance between the activity and the nest (buffer area); (2) maintaining natural areas (preferably forested) between the activity and nest trees (landscape buffers); and (3) avoiding certain activities during the breeding season. Specifically, construction activity is prohibited within 660 feet of an active nest during the nesting season, which in the Midwest is generally from late January through late July. There are currently no known bald eagle nests within the project area.

### **3.11 HISTORIC AND CULTURAL RESOURCES**

Cultural resources are locations of past human activity, occupation or use and typically include archaeological sites such as prehistoric lithic scatters, villages, procurement area, rock art, shell middens; and historic era sites such as refuse scatters, homesteads, railroads, ranches, logging camps, and any structures or buildings that are over 50 years old. Cultural resources also include Traditional Cultural Properties (TCPs), which are aspects of the landscape that are part of traditional lifeways and practices and are considered important to a community. The National Historic Preservation Act (NHPA) is the major piece of federal legislation that mandates that federal agencies consider how undertakings could affect significant cultural resources.

The 2019 archival review, conducted by CDM Smith, for the proposed realignment of Highway D revealed that no archaeological sites were located within the project area, but ten sites were within one mile. Two archaeological surveys had taken place within the study tract and one had been conducted within one mile. The historical records indicate that people were living within Lost Creek Township as early as the 1850, but the project area was not officially purchased until 1853. It is unclear if any of the original landowners lived within the boundaries of the project area.

The 2019 cultural resource survey, conducted by CDM Smith, investigated six agricultural fields west of Highway D, wooded areas west and east of Highway D, two residential areas east of Highway D, and four culverts under Highway D. With the exception of the southwestern portion of the project area, the survey found that wooded areas west of Highway D and portions of the agricultural field were in hydraulic soils and standing water was present on the surface. The wooded areas east of Highway D were generally on steep slopes. Additionally, disturbed areas in the form of scraped ground surface and push piles were noted in one of the agricultural fields and at both of the residential areas.

Subsurface testing was conducted on all areas outside of the slopes, saturated soils, and disturbed areas. The testing determined that most of the project area had intact soils, with the exception of slight erosion that had taken place in the southeastern residential area. No buried cultural resources were identified during the survey.

One site, 23WE2250, was identified in the southwestern portion of the project area. Although the historic records indicated that the property was owned by Alex Jones et al., local resident Alvie Richmond stated that the property was the farmstead of Elmer and Hattie Bilbrey. Located at the base and on a slope, the site consisted of a pond, a wagon trail, an outbuilding (Outbuilding 1), a pier foundation (Outbuilding 2), and a small scatter of historic artifacts. Subsurface testing at the base of a slope, where the 1934 topographic map identified a building, revealed intact soils. It is believed that the building was misidentified on the 1934 topographic map. Shovel tests next to Outbuilding 1 revealed that the A1 and A2 horizons were missing, which is approximately eight inches of soil. The area most likely had been scraped when Outbuilding 1 was removed. No evidence of the building identified on the 1966 with 1967 update topographic was found. Shovel tests in other areas of the site revealed intact soils. No buried cultural resources were identified at site 23WE2250, but artifacts were recovered from the surface. Only a few could be definitively dated to the mid-1960s to mid-1970s. Due to intact soils, the lack of subsurface features, and late dating artifacts, site 23WE2250 does not meet the National Register of Historic Places (NRHP) criteria for eligibility.

The 1934 Greenville 15' US Geological Survey topographic map also identified a building on Alex Jones et al. property that was adjacent to the eastern portion of the project area. Census records indicated that it could have been the residence of his parents, Ellie and Nannie. Subsurface testing in this area revealed intact soils. A graniteware bucket was identified on surface, but no other cultural resources were located during the survey. It is believed the home was misidentified on the topographic map.

An abandoned farmstead was noted in the southeastern portion of the project area. The 1966 with 1985 update topographic map indicated that no buildings were within this area at the time. A 1996 Google Earth satellite image showed the residence and outbuildings present. Because the farmstead was less than 50 years old, it does not meet the NRHP criteria for eligibility.

Four culverts were identified under Route D. Only one of the culverts, Culvert 4, was older than 50 years. Although in good condition, Culvert 4 is a concrete box, which is ubiquitous throughout the US and still constructed today. It is not eligible for the NRHP.

The 2019 survey identified two historic cultural resources within the project area: site 23WE2250 and Culvert 4. Neither of these resources meet the criteria of significance for the NRHP. For these reasons, project clearance was recommended. However, if the project limits are to be altered in anyway, then the State Historic Preservation Office will need to be notified immediately to make a determination if an additional survey is necessary.

### 3.12 TRIBAL RESOURCES

In addition to the consultation with Missouri State Historic Preservation Office (MOSHPO), consultation with Native American Tribal organizations would also be required to ensure compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. The USACE St. Louis District has previously established consultation agreements with 26 Tribal organizations that have ties to, or an interest in, the District's region.

On March 6, 2019, representatives from all 26 Tribal organizations that have ties to, or an interest in, the St. Louis District were contacted via letter in order to initiate consultation in accordance with Section 106 of the National Historic Preservation Act of 1964, as amended, for the proposed road relocation. A copy of the Phase I archaeological survey, described in Section 3.11, was enclosed with the letter. Letters indicating no objection to the proposed project were received from the Delaware Tribe of Indians, Delaware Nation, Eastern Shawnee Tribe, Shawnee Tribe, and Osage Nation (Appendix A).

### 3.13 SOCIOECONOMICS AND TRANSPORTATION

To determine the socioeconomic profile of the project area, data from the US Census Bureau's 2000 Census, 2010 Census, and the American Community Survey (ACS) 2012 to 2016 5-year Estimate was collected. The project area is wholly contained within one Census block group. The Census block group containing the project area has a population of 636 persons. There are no homes in the project area, but immediately adjacent to it are three single-family homes. Based on an average household size of 2.3, it is estimated that there are approximately seven people living adjacent to the project area.

The project area is within Wayne County, Missouri. The population of Wayne County was 13,341 in 2016 (Table 3). This is a 0.6 percent increase since 2000. During this same period Missouri experienced an approximately eight percent increase in population. In addition, the age distribution of the project area is very similar to that of the surrounding jurisdictions. However, the gender distribution shows a higher percentage of males and a lower percentage of females in the Census Block Group containing the project area than in Wayne County and Missouri (Table 4).

Table 3. The project area is within Wayne County, Missouri, which has experienced a population increase between 2000 - 2010 according to the U.S. Census (2000 & 2010) and the ACS 5-year estimates.

Area	2000	2010	% Change 2000 to 2010	2016	% Change 2000 to 2016
Missouri	5,595,211	5,988,927	7.0%	6,059,651	8.3%
Wayne County	13,259	13,521	2.0%	13,341	0.6%

Table 4. The age distribution of the Census Block Group containing the project area is similar to the county and state distribution according to US Census Bureau, ACS 2012-2016, 5-Year Estimate.

Age/Gender	Census Block Group Containing the Project Area	Wayne County	Missouri
<b>Total population</b>	636	13,341	6,059,651
<b>Under 18</b>	22.6%	21.0%	23.0%
<b>18 to 64</b>	59.4%	57.0%	61.6%
<b>65 and Older</b>	17.9%	21.9%	15.3%
<b>Male</b>	53.3%	49.8%	49.1%
<b>Female</b>	46.7%	50.2%	50.9%

Highway D is a two-lane roadway with one driveway access to residential homes and one intersection with Wayne County Route 524. The roadway has minimal grass shoulder through the rolling hills and curves of southeastern Missouri. Highway D is mostly surrounded by wooded areas including the Yokum School Conservation Area just to the south of the project area. Highway D runs from US 67 near Greenville, MO to Route T in Wappapello, MO east of Wappapello Lake.

MoDOT provided average daily traffic and projected future volumes for the Highway D corridor in October 2018. According to MoDOT data, this portion of Highway D carries 1,689 vehicles on an average day. It is projected the route will carry 1,732 vehicles in 2022 at the beginning of construction and 1,913 vehicles in the design year 2042. Trucks account for 3.4 percent of the daily traffic.

MoDOT provided crash history along the Highway D corridor in October 2018 for the five years from 2013-2017. According to MoDOT's crash data, there have been seven vehicular related crashes in the project area resulting in one minor injury and six property damage only crashes. The 2016 crash rate (172.17) within the project area is below the statewide rate for both the roadway designation (221.29) and roadway type (two-lane road 182.32). The crash types include four out of control crashes, two deer crashes, and one other.

### 3.14 HAZARDOUS, TOXIC, AND RADIOACTIVE MATERIALS

USACE regulations (ER 1165-2-132 and ER 200-2-3), and St. Louis District policy, requires procedures be established to facilitate early identification and appropriate consideration of potential hazardous, toxic, or radioactive water (HTRW) in reconnaissance, feasibility, preconstruction engineering and design, land acquisition, construction, operations and maintenance, repairs, replacement, and rehabilitation phases of water resource studies or projects by conducting HTRW Initial Hazard Assessments. USACE specifies that these assessments follow the process/standard practices for conducting Phase I Environmental Site Assessments published by the American Society for Testing and Materials (ASTM). The objective of the Phase I was to identify, to the extent feasible pursuant to the process described, recognized environmental conditions (RECs) in connection with a given property(s). This assessment is prepared using the following ASTM Standards:

- E1527-13: Standard Practice for Environmental Site Assessments – Phase I Environmental Site Assessment process
- E1528-06: Standard Practice for Limited Environmental Due Diligence: Transactions Screen Process (interview questionnaires)
- E2247-08: Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process for Forestland or Rural Property

The purpose of the Phase I Environmental Site Assessment was to identify, to the extent feasible in the absence of sampling and analysis, the range of contaminants within the scope of the U.S. Environmental Protection Agency's (USEPA) Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products. As part of a larger parcel acquisition Wappapello Inholdings Project a Phase I Environmental Site Assessment was completed for two properties located on the Highway D road relocation project area on August 27, 2015 (USACE, 2015). These two properties were known as Elder and Robinson. The scope of the Phase I consisted of the following two components: 1) records review; and 2) interviews. At the time, a site visit was not possible. The assessment revealed no RECs in connection with these properties. There were no records indicating any spills, pesticide/herbicide use, or HTRW contamination. Therefore, no Phase II assessment was necessary for the project areas. A review of this Elder-Robinson Phase I was conducted on December 4, 2019. Recent site photographs and satellite imagery concluded there exist no RECs.

### 3.15 AIR QUALITY AND NOISE

The Clean Air Act of 1963 requires the USEPA to designate National Ambient Air Quality Standards (NAAQS). The USEPA has identified standards for six pollutants: lead, sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, particulate matter (less than 10 microns and less than 2.5 microns in diameter), along with some heavy metals, nitrates, sulfates, volatile organic and toxic compounds (Table 5).

Table 5. Six pollutants and their standard criteria designated by the USEPA.

Pollutant	Averaging time	Criteria	Form
<b>Carbon monoxide</b>	8 hours	9 ppm	Not to be exceeded more than once per year
	1 hour	35 ppm	
<b>Lead</b>	Rolling 3 month	0.15 µg/m <sup>3</sup>	Not to be exceeded
<b>Nitrogen dioxide</b>	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	1 year	53 ppb	Annual Mean
<b>Ozone</b>	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
<b>Particle Pollution (PM<sub>2.5</sub>)</b>	1 year	12.0 µg/m <sup>3</sup>	Annual mean, averaged over 3 years
	24 hours	35 µg/m <sup>3</sup>	98th percentile, averaged over 3 years
<b>Sulfur dioxide</b>	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years

The project area is in rural Wayne County in the Ozark foothills near Wappapello Lake. The Missouri Department of Natural Resources maintains approximately 50 air monitors across the state to track



concentrations of these six pollutants. Wayne County is in attainment for all six criteria pollutants (USEPA, 2019).

The land use surrounding the proposed project includes wooded rural foothills, fen wetlands associated with East Fork Lost Creek, conservation easements, open space and recreational areas. There are no major population centers near the project area. Agricultural and open space areas typically have noise levels in the range of 30-70 decibels (dB) depending on their proximity to major transportation facilities. Noise associated with major transportation facilities such as highways and railroads would be greater than those in rural areas. In addition to mining/quarry operations near the project area, transportation related noise associated with Highway D, are the main sources of noise within the study area. Figure 7 illustrates common sounds and their associated noise levels. Areas sensitive to noise near the project area include the Helm Cemetery (northeast of the project area) and three single-family residential properties to the north and residential properties south of the project area.

COMMON SOUND/NOISE LEVELS		
Outdoor	dBA	Indoor
	110	Rock band at 5 meters
Jet flyover at 300 meters		
Pneumatic hammer	100	Subway train
Gas lawn mower at 1 meter		
	90	Food blender at 1 meter
Downtown (large city)	80	Garbage disposal at 1 meter
		Shouting at 1 meter
Lawn mower at 30 meters	70	Vacuum cleaner at 3 meters
Commercial area		Normal speech at 1 meter
Air conditioning unit	60	Clothes dryer at 1 meter
Babbling brook		Large business office
Quiet urban (daytime)	50	Dishwasher (next room)
Quiet urban (nighttime)	40	Library
	30	
	20	
	10	
		Threshold of hearing
	0	

Figure 7. The land-use within the project area consists of forest, agriculture, and transportation. Agricultural and open space areas typically have noise levels in the range of 30-70 decibels (dB).

## 4 ENVIRONMENTAL CONSEQUENCES

The discussion of impacts (environmental consequences) detail those resources that could be impacted, directly or indirectly, by the No Action Alternative and the two Action Alternatives. Direct impacts are those that would take place at the same time and place (40 CFR§1508.8(a)) as the action under

consideration. Indirect impacts are those that are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR §1508.8(b)).

## **4.1 TOPOGRAPHY, GEOLOGY, AND SOIL**

### **4.1.1 No Action Alternative**

The topography, geology, and soil composition of the project area would not be expected to change as a result of taking no action to raise or relocate Highway D.

### **4.1.2 East Alternative**

Both Action Alternatives would raise the road bed to reduce flooding and relocate the roadway away from sensitive wetland fens. The East Alternative primarily follows the existing road bed and higher elevation areas. Therefore, no additional fill would be needed to haul in to reach the minimum elevation of 405 feet needed to reduce flood risk. However, the proposed roadway under this alternative would need to cut through steep, higher elevation areas, which would result in approximately 150,000 cubic yards of overburden (i.e., excess soil and rock) to be hauled away from the construction area to an approved upland disposal area.

### **4.1.3 West Alternative**

The West Alternative would relocate the roadway to the west of the existing alignment into lower elevation areas. Building a new roadway within a low elevation area would result in the construction of a 60 feet tall earthen road embankment to reach the minimum elevation of 405 feet needed to reduce flood risk. Approximately 600,000 cubic yards of fill material would be needed to construction a new road embankment. Some fill material would come from the project site leaving approximately 370,000 cubic yards of fill material to be hauled to the construction site. The source of the fill material has not been identified. Once a fill source is identified by the contractor, they would be required to submit documentation to USACE for approval.

## **4.2 PRIME AND UNIQUE FARMLANDS**

### **4.2.1 No Action Alternative**

Agricultural land use practices are not expected to change as a result of taking no action to address roadway flooding.

### **4.2.2 East Alternative**

Agricultural land use changes under the East Alternative would be minimal. Approximately 3.5 acres of land within the East Alternative footprint is currently identified as pasture (Yang et al., 2018). However, this land classified as pasture is an existing road embankment and is not suitable for agricultural uses. Therefore, loss of existing farmland is not expected.

An analysis of the soil classifications for the East Alternative (Table 6) shows the majority of the soil within the East Alternative footprint is considered “not prime farmland”. The construction of the East Alternative would result in the direct loss of 3.4 acres of soils considered “prime farmland” and 5.6 acres of soils considered “farmland of statewide importance”.

Table 6. The NRCS soil classifications for the footprint of both project Alternatives.

Alternative	All areas are prime farmland	Farmland of statewide importance	Not prime farmland	Prime farmland if drained
<b>East</b>	3.42	5.57	16.80	0.00
<b>West</b>	26.09	2.30	9.47	0.03

#### 4.2.3 West Alternative

The implementation of the West Alternative would directly and indirectly impact existing agricultural operations. Approximately 18.5 acres within the West Alternative footprint is identified as pasture/hay (Yang et al., 2018). In addition, the northern portion of the West Alternative effectively bisects an existing pasture/hay field leaving two fields of approximately 7-10 acres each. Planting and harvesting smaller, discontinuous fields would be less efficient and more costly for the tenant farmer. The potential increase in labor costs and reduced access due to a road between the two fields could indirectly remove an additional 17.3 acres from agricultural production adjacent to the West Alternative.

An analysis of the soil classification (Table 6) shows the majority of the soil within the West Alternative footprint is considered “prime farmland”. The construction of the West Alternative would result in the direct loss of 26.1 acres of soils considered “prime farmland” and an additional 2.3 acres of soils considered “farmland of statewide importance”.

### 4.3 HYDROLOGY

#### 4.3.1 No Action Alternative

The hydrology of the project area is primarily a result of water control in Wappapello Lake as well as local and regional rainfall. The Wappapello Lake Water Control Plan was last updated in 2016, and no revisions to the plan are expected until 2026. Under the No Action Alternative, the hydrology of the project area is expected to remain similar to the existing conditions with climatic variability. Therefore, the section of Highway D within the project area would continue to flood when Wappapello Lake levels are at or above 398 feet.

#### 4.3.2 East Alternative

The proposed alterations of Highway D under the East Alternative would closely follow the existing roadway so no changes to the hydrology of the project area are expected. Similar to the No Action Alternative, the hydrology of the project area would continue to be a result of the water control in Wappapello Lake as well as local and regional rainfall. However, Highway D would no longer be flooded when Wappapello Lake levels are high, unless water reached elevations of 405 feet or greater.

#### 4.3.3 West Alternative

The West Alternative would require the construction of a new 60 feet tall road embankment within the 100-year floodplain closer to Wappapello Lake. The construction of such a large embankment would be similar to constructing a levee system within the floodplain. The proposed stream crossings within the West Alternative footprint would be the only features that could convey Wappapello Lake flood waters past the road embankment. However, Highway D would no longer be flooded when Wappapello Lake levels are high, unless water reached elevations of 405 feet or greater.

## **4.4 WETLANDS AND AQUATIC HABITATS**

### **4.4.1 No Action Alternative**

Rain and floodwater would be expected to continue carrying the salt, oils, and other chemicals into adjacent aquatic habitats, which could impact sensitive aquatic species.

### **4.4.2 East Alternative**

The East Alternative would require the extension of one existing stream crossing and would use two existing stream crossings. The existing culverted stream crossings would be replaced to accommodate a larger road embankment and to ensure the culverts are appropriately sized to allow water to flow through when the stream flows are at bankfull levels. In addition, the culverts would be placed at a depth below or at the natural stream bottom to provide for aquatic organism passage during low flow conditions. Culvert placements for stream crossings would be constructed per MoDOT EPG standards using best management practices to prevent impacts to the streams. In addition, this alternative would permanently impact 0.11 acres of wetlands. To offset the unavoidable impacts to aquatic resources, 0.44 acres of wetland mitigation credits and 2,400 stream mitigation credits would be purchased from a wetland mitigation bank and Missouri in-lieu fee program, respectively. The East Alternative is located further from the fen habitats so impacts to water quality from either alternative would be expected to be less than the existing conditions.

### **4.4.3 West Alternative**

The West Alternative would require four new stream crossings. Culvert placements for stream crossings would be constructed per MoDOT EPG standards using best management practices to prevent impacts to the streams. The culverts would be appropriately sized to allow water to flow through when the stream flows are at bankfull levels. In addition, the culverts would be placed at a depth below or at the natural stream bottom to provide for aquatic organism passage during low flow conditions. The West Alternative would permanently impact 0.60 acres of forested wetlands. To offset the unavoidable impacts to aquatic resources, 2.5 acres of wetland mitigation credits and 5,600 stream mitigation credits would be purchased from a wetland mitigation bank and Missouri in-lieu fee program, respectively. The West Alternative is located further from the fen habitats so impacts to water quality from either alternative would be expected to be less than the existing conditions.

## **4.5 WATER QUALITY**

### **4.5.1 No Action Alternative**

Under the No Action Alternative, Highway D would continue to flood when Wappapello Lake levels are 398 feet or greater. During these event, water would continue to wash over the roadway transporting chemicals from the road surface into nearby streams and wetlands, and into Wappapello Lake. If the frequency of flooding over the roadway increased, then water quality could decrease in the adjacent streams and wetlands, including the sensitive fens.

### **4.5.2 East & West Alternatives**

Under either Action Alternative, Highway D would no longer become flooded and flood waters would not be able to transport chemicals into adjacent aquatic habitats. However, runoff from intense rain events would be expected to carry some roadway pollutants into adjacent waterbodies. Both alternatives are

located further from sensitive aquatic habitats so impacts to water quality from either alternative would be expected to be less impactful than the existing conditions.

## **4.6 RECREATION AND AESTHETICS**

### **4.6.1 No Action Alternative**

Recreation and aesthetics would remain consistent with the existing conditions. Recreation opportunities would continue to be impacted during the periods that Highway D is closed due to flooding. Access to Wappapello Lake, which has several developed campgrounds and recreation areas, would be restricted and visitors and residents would not be able to enjoy the natural setting along Highway D.

### **4.6.2 East Alternative**

Recreation opportunities for the east alternative would be the least intrusive as the roadway would be primarily built over an existing road embankment. This alternative minimizes the footprint in areas that people use to pursue wildlife. Additionally, this alternative keeps activities away from the East Fork of Lost Creek allowing visitors to still use this area during construction. Corps Road 9 should also be able to be open for a longer period of time allowing public access until the road is being connected to Highway D. Highway D is a primary artery to access Wappapello Lake which has several developed campgrounds and recreation areas. Both alternatives would impact travel to these locations from Greenville, MO. The aesthetics of the area would not be expected to change since this alternative would use most of the existing road alignment.

### **4.6.3 West Alternative**

Recreation opportunities for the west alternative would be more intrusive as this area is more heavily used for hunting, fishing and swimming and would be impacted/closed for longer periods of time for construction. Recreation opportunities would likely be limited once construction was completed and until new access areas are designed. Corps road 9 would also be closed longer for construction. Highway D is a primary artery to access Wappapello Lake which has several developed campgrounds and recreation areas. Both alternatives would impact travel to these locations from Greenville, MO. This alternative would impact the aesthetics of the area for residents adjacent to the project area. Based on the scoping meeting held in August 2019, residents from higher elevation areas voiced concerns that the West Alternative would impact the pleasant view of the wooded areas and pastures that they currently enjoy from their homes.

## **4.7 LAND-USE**

### **4.7.1 No Action Alternative**

Under the No Action Alternative, the existing roadway would not be altered. No changes to land-use practices would be expected as a result of taking no action to address flooding along this section of Highway D.

### **4.7.2 East Alternative**

According to the NLCD (Yang et al., 2018) land-use within the footprint of the East Alternative, a mixture of developed, forested, and pasture land-uses would be directly impacted (Table 7). The developed land that would be impacted as part of this alternative is the existing roadway. Approximately 13.36 acres of permanent tree clearing would be needed. Out of the total acres of tree clearing,

approximately four acres are within the 100-year floodplain and are considered bottomland hardwood forest. Unavoidable impacts to bottomland hardwood forests would need to be mitigated for according to Section 906 of Water Resources Development Act (WRDA) of 1986 as amended by Section 2306(a) of WRDA 2007. Impacts to wetlands and other aquatic habitats are discussed in Section 4.4 and impacts to agricultural lands (i.e., cropland and pasture/hay) are discussed in Section 4.2.

Table 7. Construction of both alternatives would permanently impact current land-use practices within the project area. Bottomland forests are any forested habitats within the 100-year floodplain.

Land Type	East Alternative	West Alternative
<b>Developed, Open Space</b>	8.00	2.67
<b>Developed, Low Intensity</b>	0.45	--
<b>Deciduous &amp; Mixed Forest</b>	13.36	14.01
<b><i>Bottomland Forest</i></b>	4.00	6.45

#### 4.7.3 West Alternative

According to the 2016 NLCD land-use within the footprint of the West Alternative, a mixture of developed, forested, and pasture land-uses would be directly impacted (Table 7). The developed land that would be impacted as part of this alternative is the existing roadway. Approximately 14 acres of permanent tree clearing would be needed. Out of the total acres of tree clearing, approximately 6.45 acres are within the 100-year floodplain and are considered bottomland hardwood forest. Unavoidable impacts to bottomland hardwood forests would need to be mitigated for according to Section 906 of Water Resources Development Act (WRDA) of 1986 as amended by Section 2306(a) of WRDA 2007. Impacts to wetlands and other aquatic habitats are discussed in Section 4.7 and impacts to agricultural lands (i.e., cropland and pasture/hay) are discussed in Section 4.2.

## 4.8 FISH AND WILDLIFE

#### 4.8.1 No Action Alternative

Impacts to fish and wildlife would remain consistent with the existing conditions. Rain and floodwater would be expected to continue carrying the salt, oils, and other chemicals into adjacent aquatic habitats, which could impact sensitive fish species as well as species that live in the fens.

#### 4.8.2 East Alternative

There would be impacts to wildlife as forested areas are temporarily (9.34 acres) and permanently (13.36 acres) cleared during construction. However, the area adjacent to the East Alternative footprint is densely forested and would provide places for wildlife displaced due to construction a place to take shelter until construction would be completed. All work near the streams would be completed per MoDOT EPG standards using sediment and erosion best management practices to prevent impacts to fish and aquatic organisms. In addition, this alternative would use and improve upon existing stream crossings, so additional impacts to aquatic habitats would not be anticipated. This alternative also moves the roadway further from the sensitive fen habitats so impacts to the unique species that live there would not be anticipated.

#### 4.8.3 West Alternative

There would be impacts to wildlife as forested areas are temporarily (6.45 acres) and permanently (14.01 acres) cleared during construction. However, the area adjacent to the West Alternative footprint is densely



forested and would provide places for wildlife displaced due to construction a place to take shelter until construction would be completed. All work near the streams would be completed per MoDOT EPG standards using best management practices to prevent impacts to fish and aquatic organisms. However, this alternative would require five new stream crossings, so additional impacts to aquatic habitats may occur. This alternative also moves the roadway further from the sensitive fen habitats so impacts to the unique species that live there would not be anticipated.

## **4.9 THREATENED AND ENDANGERED SPECIES**

### **4.9.1 State Listed Species**

No State-listed species were identified within the project area during consultation with Missouri Department of Conservation.

### **4.9.2 Federally Listed Species (Biological Assessment)**

#### **4.9.2.1 No Action Alternative**

Under the No Action Alternative, the existing roadway would not be altered. No impacts to threatened or endangered species would be expected as a result of taking no action to address flooding along this section of Highway D.

#### **4.9.2.2 East & West Alternatives**

**Gray bat** (*Myotis grisescens*) - Recent bat monitoring efforts conducted by USACE and the U.S. Forest Service have detected gray bats within the project area. It is unknown if a hibernaculum is present within the project area since gray bats can travel several miles from their hibernacula to feed. The gray bat could be using stream corridors within the project area to feed, or traveling through the area to feed closer to Wappapello Lake. Tree clearing is anticipated for both alternatives, which may impact feeding and travel areas for the gray bat. Approximately 13 acres and 14 acres of permanent tree clearing is estimated for the East and West Alternatives, respectively. Tree clearing would only occur during 1 November to 31 March of any year to minimize construction impacts to the bat population. In order to offset any potential adverse impacts to bat species, mitigation credits would be purchased from Range-wide Indiana Bat In-Lieu Fee Program administered by The Conservation Fund. Therefore, the St. Louis District has determined that the proposed actions “may affect, but not likely to adversely affect” the gray bat.

**Indiana bat** (*Myotis sodalis*) - Tree clearing is anticipated for both alternatives, which may impact feeding and travel areas, and potential roosting areas for the Indiana bat. Approximately 13 acres and 14 acres of permanent tree clearing is estimated for the East and West Alternatives, respectively. Tree clearing would only occur during 1 November to 31 March of any year to minimize construction impacts to the bat population. In order to offset any potential adverse impacts to bat species, mitigation credits would be purchased from Range-wide Indiana Bat In-Lieu Fee Program administered by The Conservation Fund. Therefore, the St. Louis District has determined that the proposed actions “may affect, but not likely to adversely affect” the Indiana bat.

**Northern long-eared bat** (*Myotis septentrionalis*) - Tree clearing is anticipated for both alternatives, which may impact feeding and travel areas, and potential roosting areas for the Northern long-eared bat. Approximately 13 acres and 14 acres of permanent tree clearing is estimated for the East and West Alternatives, respectively. Tree clearing would only occur during 1 November to 31 March of any year to minimize construction impacts to the bat population. In order to offset any potential adverse impacts to

bat species, mitigation credits would be purchased from Range-wide Indiana Bat In-Lieu Fee Program administered by The Conservation Fund. Therefore, the St. Louis District has determined that the proposed actions “may affect, but not likely to adversely affect” the Northern long-eared bat.

#### **4.10 BALD AND GOLDEN EAGLE**

There are no bald eagles or bald eagle nests within or adjacent to the project area. No impacts to bald eagles are anticipated as a result of the No Action and the two Action Alternatives.

#### **4.11 HISTORIC AND CULTURAL RESOURCES**

##### **4.11.1 No Action Alternative**

Historic and cultural resources would remain consistent with the existing conditions. No adverse effects would be expected as a result of taking no action to raise or relocate Highway D.

##### **4.11.2 East & West Alternative**

The archival review for the proposed realignment of Highway D revealed that no archaeological sites were located within the project area. There are no historic and cultural resources in the project area. As a result, neither of the Action Alternatives would impact historic and cultural resources. The MOSHPO concurred with the determination that there will be no historic properties affected in their April 2, 2019 letter (Appendix A).

#### **4.12 TRIBAL RESOURCES**

##### **4.12.1 No Action Alternative**

Tribal resources would remain consistent with the existing conditions. No adverse effects would be expected as a result of taking no action to raise or relocate Highway D.

##### **4.12.2 East & West Alternative**

On March 6, 2019, representatives from all 26 Tribal organizations that have ties to, or an interest in, the St. Louis District were contacted via letter in order to initiate consultation in accordance with Section 106 of the National Historic Preservation Act of 1964, as amended, for the proposed road relocation. A copy of the Phase I archaeological survey, described in Section 3.11, was enclosed with the letter. Letters indicating no objection to the proposed project were received from the Delaware Tribe of Indians, Delaware Nation, Eastern Shawnee Tribe, Shawnee Tribe, and Osage Nation (Appendix A).

#### **4.13 SOCIOECONOMICS AND TRANSPORTATION**

##### **4.13.1 No Action Alternative**

Continued flooding and subsequent road closures of Highway D would result in continued negative socioeconomic and transportation impacts. The roughly 1,700 vehicles that travel Highway D each day would need to use longer and more time consuming routes to get around the flooding. The businesses along Highway D may also be impacted due to restricted access during times of flooding. In addition, frequent flooding of the roadway will result in increased maintenance due to flood damage. Repairing flood damage requires temporary lane closures resulting in increased traffic congestion. Road safety would still remain a safety concern for residents and visitors to Wappapello Lake.

#### **4.13.2 East Alternative**

Traffic patterns and existing access points near the proposed improvements would be affected by construction activities. The two-year construction schedule would be coordinated in advance to minimize the effects of such a disruption. Suitable detours would be required to maintain traffic circulation, and areas under construction would be controlled to limit the extent of disruption to traffic flow. Contractors would be required to maintain access within a specified distance of any inhabited areas to assure continued fire protection and emergency services. Maintaining proper traffic circulation is particularly important to the surrounding businesses and freight carriers, who count on the reliability of the transportation system to conduct business and maintain profit. However, raising the roadway to prevent flooding and subsequent road closures would reduce how often traffic must be re-routed along longer, more circuitous routes, ultimately providing a benefit to the surrounding communities.

The East Alternative would also reduce the local road safety concerns along this portion of Highway D. The alignment would lessen the severity of the sharp curves and would reduce the difference in high and low elevation points.

#### **4.13.3 West Alternative**

Construction of the West Alternative would not affect traffic patterns within the project area. The alignment of the West Alternative does not follow the existing roadway, therefore the 1.6 mile stretch of Highway D could remain open throughout the two-year construction period. In addition, raising the roadway to prevent flooding and subsequent road closures would reduce how often traffic must be re-routed along longer, more circuitous routes, ultimately providing a benefit to the surrounding communities.

The West Alternative would also reduce the local road safety concerns along this portion of Highway D. The alignment would lessen the severity of the sharp curves and would reduce the difference in high and low elevation points.

### **4.14 HAZARDOUS, TOXIC, AND RADIOACTIVE MATERIALS**

Since there are no current HTRW concerns within the project area, no environmental impacts associated with hazardous, toxic, or radioactive wastes would be anticipated from the No Action and two Action Alternatives. However, if any suspect materials were discovered at any point on USACE Wappapello Lake property, the USACE St. Louis District would be contacted immediately.

### **4.15 AIR QUALITY AND NOISE**

#### **4.15.1 No Action Alternative**

No effects to air quality or noise would result from the No Action Alternative.

#### **4.15.2 East & West Alternatives**

Neither of the Action Alternatives would be expected to significantly impact air quality. Wayne County and the project area are located in an attainment area for all criteria pollutants under the National Ambient Air Quality Standards (NAAQS). The difference in the length of the roadway between the No Action Alternative and the East and West Alternatives is less than 200 feet, and the vehicle composition using Route D is not expected to change from the existing conditions. In addition, neither alternative would be expected to have noise impacts as there are no sensitive noise receptors located within the project area.

Air quality would also be subjected to short-term impacts in the construction areas. Emissions from construction machinery would add to the motor vehicle classes of air pollution. If practical, the use of off road construction equipment that has been retrofitted with air pollution control devices would further reduce the emissions related to the project.

Grading operations and the transportation and handling of materials, such as earth and aggregates, would result in the release of dust into the air. During construction, the contractor would be responsible for adequate dust-control measures to avoid causing detriment to the safety, health, welfare, or comfort of the neighboring population or to avoid causing damage to any property, residence, or businesses.

Contractors involved with the construction would be required to comply with MoDOT's Engineering Policy Guide, as well as Missouri state regulations. Specifically, adherence to the sections concerning fugitive dust and visible emissions would be required in the construction contracts in an effort to minimize the short-term effects upon air quality within the project areas. Therefore, impacts to air quality and noise would be minor and temporary in nature.

## **5 ENVIRONMENTAL JUSTICE**

Environmental Justice regulations were established to address disproportionately high and adverse human health or environmental effects that projects funded by the federal government may have on minority and low-income populations. The Environmental Justice requirements were established by Executive Order 12898 in 1994 entitled "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." This mandates that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of proposed projects on minority and low-income populations. Environmental Justice builds on Title VI of the Civil Rights Act of 1964. Environmental Justice has three guiding principles:

- Avoid, minimize, or mitigate disproportionately high and adverse human health and environmental impacts, including social and economic effects on minority and low-income populations
- Ensure full and fair participation by all potentially affected communities in the decision-making process
- Prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and low-income populations

Environmental Justice analysis applies to both minority and low-income populations. For the analysis of Environmental Justice, minority populations are defined as any person who is Black, Hispanic, Asian American, American Indian, or Alaskan Native.

The US Department of Transportation (USDOT) recommends using the US Department of Health and Human Services (HHS) poverty guidelines when identifying low-income populations. The HHS poverty guidelines vary by family size and geographic location. The current (2018) poverty level in the 48 contiguous states and the District of Columbia is \$12,140 for an individual and \$25,100 for a household of four.

As mentioned above, there is no one living in the project area, but there are three single-family homes immediately adjacent to the project area with an estimated population of seven persons. An environmental justice evaluation was completed to determine the likelihood that these persons were environmental justice populations.

The percent of minorities living in the Census block group containing the project area is 2.2 percent (Table 8). This is slightly lower than the percent of minorities living in Wayne County and much lower than the percent of minorities living the state of Missouri.

Table 8. Ethnicity and Race of individuals within the Census Block Group that contains the project area compared to Wayne County and the state of Missouri according to the US Census Bureau, ACS 2012-2016 5-Year Estimate.

<b>Ethnicity and Race</b>	<b>Census Block Group</b>	<b>Wayne County</b>	<b>Missouri</b>
<b>Total Persons</b>	636	13,341	6,059,651
<b>Total Minority Population</b>	2.2%	4.4%	20.0%
<b>White Population (Non-Hispanic)</b>	97.8%	95.6%	80.0%
<b>African American Population</b>	0.0%	0.7%	11.5%
<b>American Indian Population</b>	0.0%	0.4%	0.4%
<b>Asian Population</b>	0.0%	0.1%	1.8%
<b>Native Hawaiian Population</b>	0.0%	0.0%	0.1%
<b>Hispanic Population (all races)</b>	0.0%	1.5%	3.9%
<b>Other Race Alone</b>	0.0%	0.0%	0.1%
<b>Two or More Races</b>	2.2%	1.8%	2.2%

The median household income is approximately \$31,000 within the Census Block Group containing the project area. While this is higher than the HHS 2018 poverty guidelines for a household of four, it is lower than the median household income of the surrounding jurisdictions, along with lower than Wayne County and the state of Missouri.

Analysis indicated that the percent of minorities in the census block group containing the project area is low at 2.2% and the median household income of \$31,111 is above the HHS 2018 poverty guidelines. Even though there are no Environmental Justice population residing within the project area, there could be Environmental Justice populations living immediately adjacent to the project area. Any future actions taken by MoDOT and/or USACE should avoid, minimize, or mitigate disproportionately high or adverse impacts to these populations. The road closures and detours during construction may temporarily impact the population living adjacent to the project area. However, these same populations would greatly benefit from being able to use Highway D during high water events that currently flood the existing roadway.

## 6 CLIMATE CHANGE

The USACE, Institute of Water Resources (IWR) published a document titled “Recent US Climate Change and Hydrology Literature Applicable to the U.S. Army Corps of Engineers Missions of the Upper Mississippi Region 07 in 2015”. The synopsis included in that document generally describes territory within the St. Paul, Chicago, Rock Island, and St. Louis USACE districts. The synopsis evaluated,

observed and projected trends in temperature, precipitation, and stream flow as well as the general consensus in the literature reviewed of the trending parameters.

The USACE IWR (2015) found a general consensus for a moderate to large upward trend in observed average temperature, minimum temperatures, average precipitation, extreme precipitation, and streamflow in the Upper Mississippi Region. There is a reasonable consensus that maximum air temperatures have decreased slightly in the recent past in the region. However, projected extreme precipitation is expected to have only a small increase with moderate consensus in the literature reviewed and forecasts of future hydrology and stream-flow are anticipated to be variable, with low overall consensus in the literature reviewed. Therefore, it was presumed that these watersheds are not anticipated to incur significant precipitation changes due to climate change within the anticipated 50 year period of analysis.

## **7 CUMULATIVE AND ADVERSE IMPACTS**

This chapter identifies possible cumulative effects of the considered alternatives when combined with past trends and other ongoing or expected future plans and projects. The discussion of cumulative impacts considers the effects on the resource that result from the incremental impact of the action being considered when added to other past, present, and reasonably foreseeable future actions regardless of what agency, Federal or non-Federal, or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taken place over a period of time (40 CFR §1508.7).

### **7.1 CUMULATIVE EFFECTS OVERVIEW**

Cumulative effects result from the proposed action when added to other past, present, and reasonably foreseeable projects or actions. Cumulative effects are not caused by a single project, but include the effects of a particular project in conjunction with other projects (past, present, and future) on the particular resource. Cumulative effects are studied to enable the public, decision-makers, and project proponents to consider the “big picture” effects of a project on the community and the environment. In a broad sense, all impacts on affected resources are probably cumulative; however, the role of the analyst is to narrow the focus of the cumulative effects analysis to important issues of national, regional, or local significance (CEQ, 1997).

The Council on Environmental Quality (CEQ) issued a manual entitled *Considering Cumulative Effects Under the National Environmental Policy Act* (1997). This manual presents an 11-step procedure for addressing cumulative impact analysis (Table 9). The cumulative effects analysis for the Wappapello Lake Highway D Road Raise/Relocation project followed these 11 steps (Table 10). The following subsections are organized by the three main components – scoping, describing the affected environment, and determining the environmental consequences.



Table 9. CEQ's 11-step approach for assessing cumulative effects.

Component	Steps
<b>Scoping</b>	1. Identify resources
	2. Define the study area for each resource
	3. Define time frame for analysis
	4. Identify other actions affecting the resources
<b>Describing the Affected Environment</b>	5. Characterize resource in terms of its response to change and capacity to withstand stress
	6. Characterize stresses in relation to thresholds
	7. Define baseline conditions
<b>Determining the Environmental Consequences</b>	8. Identify cause-and-effect relationships
	9. Determine magnitude and significance of cumulative effects
	10. Assess the need for mitigation of significant cumulative effects
	11. Monitor and adapt management accordingly

## 7.2 SCOPING FOR CUMULATIVE EFFECTS

### 7.2.1 Bounding Cumulative Effect Analysis

Cumulative effect analysis requires expanding the geographic boundaries and extending the time frame to encompass additional effects on the resources, ecosystem, and human communities of concern.

### 7.2.1.1 Identifying Geographic Boundaries

The geographic boundaries for each resource were determined by the distribution of the resource itself, and the area within that distribution where the resource could be affected by the project in combination with other past, present, and reasonably foreseeable actions (Table 11). The geographic boundary for the cumulative effects action area for threatened and endangered species, and other fish and wildlife, as well as land use, was defined as all lands and waters within five miles of the project boundary (Figure 8). This five mile area was used because Indiana bat foraging distances have been documented to be from about ½ mile to about five miles from roosts for females and about ½ mile to about two miles from roosts for males (USDA Forest Service, 2005). Therefore, the selected boundary should encompass the entire home range of any individual bat using any part of the proposed action area, including Indiana, gray and northern long-eared bats, in addition to any land use changes that may impact fish and wildlife. For aquatic habitats and wetlands, water quality, and HTRW, the Upper St. Francis watershed (HUC8) serves as a natural geographic boundary. Cultural resources and recreation were analyzed within the Wappapello Lake boundary. The USACE Wappapello Lake Project has specific requirements and authorization to analyze, promote, and protect cultural and recreational resources on federal lands. Finally, socioeconomics, transportation, and air quality were analyzed within Wayne County, MO because the county-level is typically how data is reported and regulated by other state and federal agencies.

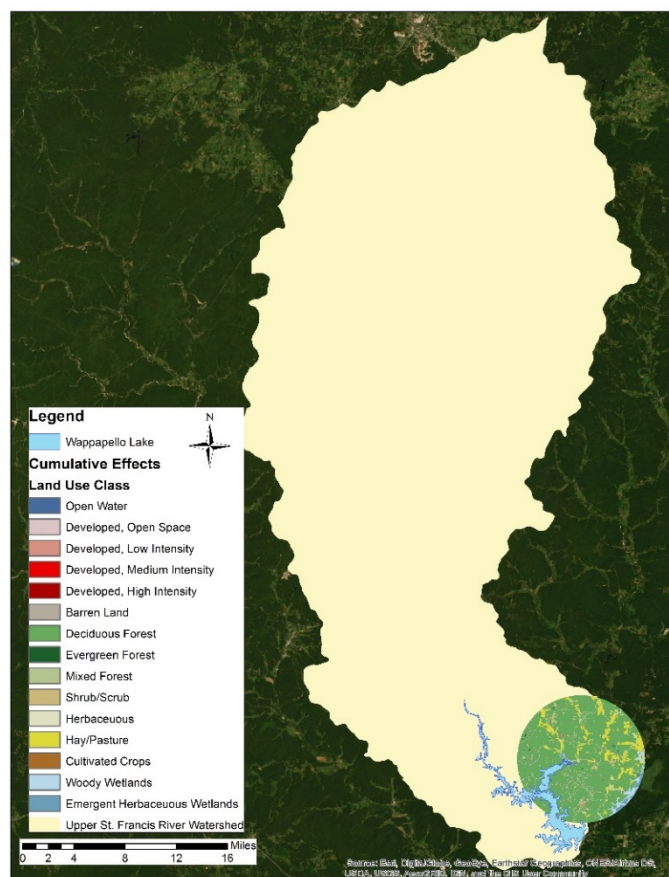


Figure 8. Geographic boundaries were established for each resource.

Table 10. Geographic boundaries for the cumulative effects analysis for resources outlined in this Environmental Assessment.

Resource	Geographic Boundary
Land use	5-mile Radius
Aquatic Habitat & Wetlands	St. Francis River Basin
Wildlife & Fisheries	5-mile Radius
MO Species of Concern	5-mile Radius
Threatened & Endangered Species	5-mile Radius
Water Quality	St. Francis River Basin
HTRW	St. Francis River Basin
Historic & Cultural Resources	Wappapello Lake Boundary
Socioeconomics & Transportation	Wayne County, MO
Recreation & Aesthetics	Wappapello Lake Boundary
Air Quality & Noise Levels	Wayne County, MO

### **7.2.1.2 Identifying Timeframe**

The timeframe for the cumulative effects analysis for each resource begins when past actions began to change the status of the resource from its original condition, setting the long-term trend currently evident and likely to continue into the reasonably foreseeable future. For all resources, the timeframe began in approximately 1941 when the construction of the Wappapello Lake Dam was originally completed, and ends in 2033 (10 years after proposed project completion).

### **7.2.2 Identifying Past, Present, and Reasonably Foreseeable Future Actions**

Chapter 3 of this Environmental Assessment describes the condition of each resource in terms of their existing conditions and provides historical context for how the resource got to its current state. Information from discussions with resource managers, and online searches were used to assess the existing conditions of the identified resources. In order to identify present and reasonably foreseeable actions, information from resources managers and online resources were compiled. “Reasonably foreseeable actions” were defined as actions or projects with a reasonable expectation of actually happening, as opposed to potential developments expected only on a basis of speculation. The following criteria were applied to determine reasonably foreseeable actions:

- Actions on an agency’s list of proposed actions
- Actions where scoping has started
- Actions already permitted
- Actions where budgets have been requested

Based on these criteria, the following actions were identified as being reasonably foreseeable and were included in this cumulative effects analysis:

- **Wappapello Lake Timber Stand Improvement (TSI; 2011)** – An EA/FONSI signed in 2011 outlined the impacts of TSI at Wappapello Lake. TSI occurred in three forest compartments. The TSI work completed in Compartment 2, also known as Browns Hollow, was partially funded by MoDOT as part of their bat mitigation associated with the expansion of Highway 67 at the northern end of Wappapello Lake. The TSI was estimated to occur across 12,000 acres of forested habitats over approximately eight years.
- **Wappapello Lake Master Plan (2019)** – Numerous proposed actions have been included in the updated Master Plan, including land classification changes; assigning land classification to recently acquired land; adjusting acreages as a result of such changes and based on more accurate mapping capabilities; evaluating road raise and/or relocation plans; updating plates to reflect changes since the 2000 Master Plan was prepared; and a listing of future undertakings such as new construction and facility replacement. Actions within the Master Plan would improve recreation at designated areas around Wappapello Lake and define management actions for lands recently acquired by the Wappapello Lake Project.
- **U.S. Forest Service Mark Twain National Forest 2005 Land and Resource Management Plan & Final Environmental Impact Statement** – The U.S. Forest Service manages and administers 1.5 million acres of land in and around Wappapello Lake. The Land and Resource Management Plan guides all natural resource management activities on the Forest; addressed new information and concerns raised since the

previous Plan was published; and meets objectives of federal laws, regulations, and policies. These plans are revised every 10 – 15 years to address changed conditions and new information. Based on the alternatives laid out in this plan, the Mark Twain National Forest intends to continue the sale of timber harvests, adaptively manage oak-hickory, shortleaf pine and oak-pine communities, develop management strategies for restoring and maintaining natural forest ecosystems, use prescribed fire to restore ecosystems, emphasize protecting riparian areas, develop protections for water quality associated with karst features, and improve monitoring.

Within the cumulative effects analysis area, major land cover types include approximately 2,800 acres of open water; 38,000 acres of forest; 4,400 acres of pasture/hay lands; 1,300 acres of forested wetlands; 670 acres of emergent wetlands and 68 acres of cultivated agricultural crop lands (Yang et al., 2018). The East Alternative would result in the removal of approximately 14 acres of forest for highway construction, which less than 1% of the total available forested habitat within the cumulative effects analysis area. The high amounts of forested area can be partially attributed to the large amount of federally owned, or managed, lands within the cumulative effects analysis area. Federal agencies that own or manage land include U.S. Army Corps of Engineers (Wappapello Lake), U.S. Forest Service (Mark Twain National Forest), and U.S. Fish and Wildlife Service (Mingo National Wildlife Refuge). Because of the federal ownership of these lands, it is expected that forested habitats will remain as one of the main land uses in this region.

Since this area is highly forested, forestry is one of the dominate operations within the cumulative effects analysis area. Silvicultural systems that improve unhealthy forest conditions can include timber harvest and timber stand improvement. Over-mature forests can be regenerated through even-age and uneven-aged regeneration methods, typically conducted by means of a timber harvest operation. These regeneration methods improve forest health by removing the existing tree canopy to create canopy gaps or openings that allow sufficient light levels to develop a new age class of young healthy tree seedlings. The removal of the tree canopy provides forest products in the form of saw logs and or pulp products. Timber stand improvement (TSI) is broadly defined as an intermediate treatment. Implementation of TSI can enhance individual tree growth, quality, vigor and composition of a forest stand. Improving unhealthy forests and the removal of understory improve habitat for wildlife, including threatened and endangered bat species. For example, TSI within forested areas of Wappapello Lake that contain known Indiana bat maternity roosts has been used as a mitigation method to offset unavoidable project impacts for other agencies.

Proper forest management not only benefits the regions fish and wildlife, it also benefits the economy. The forest products industries contribute approximately \$7 billion annually to the state of Missouri's economy. It supports approximately 41,000 jobs related to wood processing and forest products within Missouri.

### **7.3 CUMULATIVE EFFECTS BY RESOURCE**

The remainder of this chapter describes the results of the cumulative effects analysis for each of the resources outlined in this Environmental Assessment (Chapters 3 & 4). The potential cumulative effects of addressing the road raise and relocation on each resources was identified (Table 12). If a resource was

not identified to have a cumulative effect, then this resource was not discussed in detail within this section. The cumulative effects analysis discusses future conditions as follows:

- Without the project – No USACE Action
- With the project – Action Alternative

Table 11. Checklist for identifying potential cumulative effects of raising/relocating Highway D.

Resource	Without Project	With Project	Past Actions	Other Present Actions	Other Future Actions	Project's Incremental Cumulative Impact
Land use	♦	♦	S	+	+	♦
Aquatic Habitat & Wetlands	♦	S	S	+	+	♦
Soil & Geology	♦	♦	♦	♦	♦	♦
Wildlife & Fisheries	♦	+	S	+	+	♦
MO Species of Concern	♦	+	S	+	+	♦
Threatened & Endangered Species	♦	S <sup>1</sup>	S	+	+	♦
Water Quality	♦	+	S	+	♦	♦
HTRW	♦	♦	S	♦	♦	♦
Historic & Cultural Resources	♦	♦	S	♦	♦	♦
Socioeconomics & Transportation	M	+	+	+	♦	+
Recreation & Aesthetics	♦	♦	+	+	+	♦
Air Quality & Noise Levels	♦	♦	♦	♦	♦	♦

**KEY:** ♦ = no change      S = slight adverse effect      S<sup>1</sup> = temporary, slight adverse effect  
M = moderate adverse effect      H = high adverse effect      + = beneficial effect

## 8 EVALUATION & COMPARISONS OF ALTERNATIVES

The selection of a suitable alternative is based on several selection criteria. Considerations for road alignment selection included:

- Meets project objective
- Meets regulatory requirements
- Avoids or minimizes any cultural or environmental impacts
- Avoids impacts to sensitive fen habitats
- Meets MoDOT criteria for road safety
- Minimizes the construction footprint, construction cost, and operation and maintenance (O&M) costs

When the No Action Alternative and two Action Alternatives are compared, there are several similarities and differences (Table 9). The No Action Alternative would not meet the project objective and would not reduce or eliminate flooding of Highway D. Both Action Alternatives would meet the project objective.

The East and West Alternatives are similar in terms of their potential cultural and environmental impacts. Both Action Alternatives would result in tree clearing, and wetland and stream impacts, all of which would require mitigation. In addition, both Action Alternatives would move the roadway further from sensitive fen habitats, and improve road safety. However, the West Alternative would be more costly and would impact the aesthetics of the area, which the local residents voiced concerns about during the public meeting. Therefore, the East Alternative was identified by the project delivery team as the Tentatively Selected Plan.

Table 12. Potential impacts for each alternative and construction costs were compared in order to tentatively select a suitable alternative for further development.

Resource	No Action	East Alternative	West Alternative
<b>Project Objective</b>	Does not meet objective	Fully meets objective	Fully meets objective
<b>Estimated Construction Cost</b>	—	\$4.282M	\$7.604M
<b>Road Safety</b>	Potential negative impact as roadway winds through the rural area. Although the crash numbers do not indicate an issue, anecdotal concerns exist.	Beneficial impact as the road geometry is designed to standards, curves are tempered, and road is raised to reduce flood risk.	Beneficial impact as the road geometry is designed to standards, curves are tempered, and road is raised to reduce flood risk.
<b>Land use</b>	No Change	13 acres of tree clearing	14 acres of tree clearing
<b>Prime Farmland</b>	No Change	Loss of 3.42 acres	Loss of 26.09 acres
<b>Aquatic Habitat &amp; Wetlands</b>	If the frequency of flooding over the roadway increased, then water quality could decrease in the adjacent streams and wetlands, including the sensitive fens.	Permanently impact 0.11 acres of wetlands; Culverts would accommodate 100-year stream flows. Avoids impacts to fens.	Permanently impact 0.60 acres of wetlands; Culverts would accommodate 100-year stream flows. Avoids impacts to fens.
<b>Hydrology</b>	No Change	Similar to No Action. Highway D would only be flooded when water elevations reached 405 feet.	New 60 feet tall road embankment within the 100-year floodplain closer to Wappapello Lake. The construction of the embankment would be similar to constructing a levee system within the floodplain.
<b>Soil &amp; Geology</b>	No Change	New roadway would cut through higher elevation areas. An estimated 150,000 cubic yards of excess soil and rock would be generated. Disposal area not identified.	New roadway constructed in low elevation areas. An estimated 600,000 cubic yards of fill material needed. Fill source has not been identified.
<b>Wildlife &amp; Fisheries</b>	No Change	Tree clearing would displace wildlife. Moves roadway further from sensitive fens.	Tree clearing would displace wildlife. Moves roadway further from sensitive fens.
<b>MO Species of Concern</b>	No Change	Coordination with MDC during construction is needed.	Coordination with MDC during construction is needed.

<b>Threatened &amp; Endangered Species</b>	No Change	Mitigation would offset potential impacts to bat species.	Mitigation would offset potential impacts to bat species.
<b>Water Quality</b>	If the frequency of flooding over the roadway increased, then water quality could decrease in the adjacent streams and wetlands, including the sensitive fens.	Moves roadway further from sensitive fens. Reduced roadway flooding could improve water quality.	Moves roadway further from sensitive fens. Reduced roadway flooding could improve water quality.
<b>HTRW</b>	No Change	No Change	No Change
<b>Historic, Cultural, &amp; Tribal Resources</b>	No Change	No Change	No Change
<b>Socioeconomics &amp; Transportation</b>	Continued negative flooding impacts as a result of high lake levels.	Temporary traffic detours during construction. Traffic and economics would not decrease due to flooding.	Traffic and economics would not decrease due to flooding.
<b>Recreation &amp; Aesthetics</b>	Restricted access to recreation during road flooding.	Restricted access during construction. Minimizes project footprint and impacts to undisturbed areas.	Restricted access during construction. New access areas to USACE areas would be needed. Impacts pleasant views of the wooded and pasture areas currently enjoyed by residents and visitors.
<b>Air Quality &amp; Noise Levels</b>	No Change	Temporary increases in noise levels that would cease after construction.	Temporary increases in noise levels that would cease after construction.



## 9 PUBLIC REVIEW

Notification of the Draft Environmental Assessment and unsigned Finding of No Significant Impact was sent to officials, agencies, organizations, and individuals for public review and comment. Additionally, an electronic copy was available during the public review period (3 February – 4 March 2020) on the USACE St. Louis District's website at:

<https://www.mvs.usace.army.mil/Portals/54/docs/pm/Reports/EA/WappapelloLakeHwyDEA.pdf>

Please note that the Finding of No Significant Impact was unsigned in the draft version of the EA and will only be signed into effect after careful consideration of the comments received as a result of the public review. In addition, to ensure compliance with the National Environmental Policy Act, Endangered Species Act, and other applicable environmental laws and regulations, coordination with these entities and individuals will continue, as required, throughout the execution of the project.

## 10 ENVIRONMENTAL COMPLIANCE

Guidance	Degree of Compliance
<b>Federal Statutes</b>	
Archaeological and Historic Preservation Act, as Amended, 16 U.S.C. 469, et seq.	PC <sup>1</sup>
Bald and Golden Eagle Protection Act, 42 USC 4151-4157	FC
Clean Air Act, as Amended, 42 U.S.C. 7401-7542	FC
Clean Water Act, as Amended 33 U.S.C. 1251-1375	PC <sup>2</sup>
Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601-9675	FC
Endangered Species Act, as Amended, 16 U.S.C. 1531-1543	PC
Farmland Protection Policy Act, 7 U.S.C. 4201-4208	PC
Federal Water Project Recreation Act, as Amended. 16 U.S.C. 4601, et seq.	FC
Fish and Wildlife Coordination Act, as Amended, 16 U.S.C. 661-666c	PC
Land and Water Conservation Fund Act, as Amended, 16 U.S.C. 4601, et seq.	FC
National Environmental Policy Act, as Amended, 42 U.S.C. 4321- 4347	PC <sup>3</sup>
National Historic Preservation Act, as Amended, 54 U.S.C 300101, et seq.	PC <sup>1</sup>
Noise Control Act, 42 USC 4901, et seq.	FC
Migratory Bird Treaty Act of 1918, 16 USC 703, et seq.	FC
Resource Conservation and Recovery Act, 42 USC 6901-6987	FC
<b>Executive Orders</b>	
Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898)	FC
Floodplain Management, E.O. 11988 as amended by E.O. 12148	FC
Protection of Wetlands, E.O 11990 as amended by E.O. 12608	FC
Protection and Enhancement of the Cultural Environment, E.O. 11593	PC <sup>1</sup>
Consultation and Coordination with Indian Tribal Governments, 06 Nov 2000, E.O. 13175	PC <sup>1</sup>
Protection of Migratory Birds (EO 13186)	FC

FC = Full Compliance, PC = Partial Compliance.

1. Full compliance will be attained after all required archaeological investigations, reports and coordination have been completed.
2. Full compliance will be attained upon completion of any permitting requirements or coordination with other agencies.
3. Full compliance will be attained upon signing of the NEPA decision document.

### Applicable permits:

Certification under Section 401 of the Clean Water Act would be obtained from the Missouri Department of Natural Resources prior to contract award. Compliance with Section 404 of the Clean Water Act was coordination with the USACE Regulatory Branch and Missouri Department of Natural Resources and would be achieved with the signing of the FONSI and the 404(b)(1) Analysis, which would be included in the final Environmental Assessment.

## **11 LIST OF PREPARERS**

- Alison Anderson, Ph.D., USACE, Environmental Coordinator
- Chris Hopfinger, USACE, Regulatory Specialist
- Benjamin Greeling, USACE, HTRW
- Amy William, USACE, Cultural and Tribal Coordinator
- Eric Lemons, USACE Wappapello Lake, Project Manger
- Gina Murphy, CDM Smith, Regional Team Leader/Project Manager
- Gretchen Hanks, Missouri Department of Transportation, Road Design

## 12 WORKS CITED

- Bruen, M., P. Johnston, M.K. Quinn, M. Desta, N. Higgins, C. Bradley, and S. Burns. 2006. Impact Assessment of Highway Drainage on Surface Water Quality. Main Report.
- CDM Smith. 2019a. Wetlands Delineation Report – Missouri Route D EA Project, Wayne County, MO. Submitted January 30, 2019.
- CDM Smith. 2019b. Threatened and Endangered Species Technical Memo – Missouri Route D EA Project, Wayne County, MO. Submitted January 29, 2019.
- Collins, S.J. and R.W. Russell. 2009. Toxicity of road salt to Nova Scotia amphibians. *Environmental Pollution*. 157: 320 – 324.
- Council on Environmental Quality (CEQ). 1997. Considering Cumulative Effects under the National Environmental Policy Act.
- Missouri Department of Natural Resources (MDNR). 2018. Section 303(d) Listed Waters. MDNR – Water Protection Program.
- United State Army Corps of Engineers (USACE). 1995. Wappapello Lake Road Relocation Project – Road Alterations/Relocation. Final Environmental Assessment and Finding of No Significant Impact. St. Louis District – Environmental Planning Branch. St. Louis, MO.
- United State Army Corps of Engineers (USACE). 2011. Wappapello Lake (Compartments 2, 6, and 8) Timber Stand Improvement Management Strategies. Final Environmental Assessment and Finding of No Significant Impact. St. Louis District – Environmental Compliance Branch. St. Louis, MO.
- United State Army Corps of Engineers (USACE). 2015. Recent U.S. Climate Change and Hydrology Literature Applicable to U.S. Army Corps of Engineers Missions – Upper Mississippi Region. USACE – Institute for Water Resources. Alexandria, VA.
- United State Army Corps of Engineers (USACE). 2018. Wappapello Lake Water Quality Report. St. Louis District – Environmental Quality Section. St. Louis, MO.
- United State Army Corps of Engineers (USACE). 2019. Draft Wappapello Lake Master Plan Revision. <https://www.mvs.usace.army.mil/Missions/Recreation/Wappapello-Lake/Wappapello-Lake-Master-Plan/>
- U.S. Census Bureau. 2016. 2012 – 2016 American Community Survey 5-Year Estimates. <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>
- U.S. Department of Agriculture (USDA). 2005. Mark Twain National Forest Land and Resource Management Plan – Final Environmental Impact Statement. Mark Twain Nation Forest. Rolla, MO.
- USDA Forest Service. (2005). Mark Twain National Forest Programmatic Biological Assessment, Eastern Region, Milwaukee, Wisconsin, June 14, 2005. [http://www.fs.usda.gov/Internet/FSE\\_DOCUMENTS/fsm8\\_045284.pdf](http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm8_045284.pdf).
- United States Environmental Protection Agency (USEPA). 2019. Nonattainment Areas for Criteria Pollutants (Green Book). Data current as of 31 December 2019. <https://www.epa.gov/green-book>
- U.S. Fish and Wildlife Service (USFWS). 1993. Pallid sturgeon recovery plan. U.S. Fish and Wildlife

Service, Bismarck, North Dakota. 55 pp.

U.S. Fish and Wildlife Service (USFWS). 2010. National Bald Eagle Management Guidelines.  
<http://www.fws.gov/migratorybirds/CurrentBirdIssues/Management/BaldEagle/NationalBaldEagleManagementGuidelines.pdf>

U.S. Fish and Wildlife Service (USFWS). 2017. National Wetlands Inventory. Available at:  
<https://www.fws.gov/wetlands/index.html>.

Yang, L., Jin, S., Danielson, P., Homer, C.G., Gass, L., Bender, S.M., Case, A., Costello, C., Dewitz, J.A., Fry, J.A., Funk, M., Granneman, B.J., Liknes, G.C., Rigge, M.B., and Xian, G.. 2018. A new generation of the United States National Land Cover Database—Requirements, research priorities, design, and implementation strategies: ISPRS Journal of Photogrammetry and Remote Sensing, v. 146, p. 108–123, at <https://doi.org/10.1016/j.isprsjprs.2018.09.006>.

## FINDING OF NO SIGNIFICANT IMPACT

1. In accordance with the National Environmental Policy Act, I have reviewed and evaluated the documents relevant to the Wappapello Lake Highway D Road Relocation Project. Both Action Alternatives would raise and relocate a 1.6 mile section of Highway D above an elevation of 405 feet to prevent it from flooding when Wappapello Lake levels are high. The Action Alternatives would also alleviate the sharp turns on the existing roadway while using the existing road embankment when possible.
2. As part of this evaluation, I have considered the following project alternatives:
  - a. East Alternative (Tentatively Selected Plan) - USACE and MoDOT would relocate a 1.6 mile section of Highway D approximately 100 feet to the west of the current road at the northern end of the project section and approximately 200 feet to the east of the current road in the center of the project section. The new alignment would utilize much of the existing road embankment.
  - b. West Alternative - USACE and MoDOT would relocate a 1.6 mile section of Highway D approximately 500 to 1,000 feet west of the current alignment throughout the project area. The new alignment would require the construction of a new road embankment approximately 60 feet tall and 180 - 240 feet wide at the base and would run primarily through existing agricultural fields.
  - c. No Action Alternative- Under this alternative, no federal action would take place and Highway D would continue to flood.
3. The possible consequences of the three alternatives have been studied for physical, environmental, cultural, social, economic, aesthetic, and recreational effects. Significant factors evaluated as part of my review include:
  - a. Socioeconomic, transportation, and recreation resources would accrue benefits as a result of the project.
  - b. The proposed project would require the clearing of approximately 13 acres of trees. To offset the potential impacts to federally threatened or endangered species, mitigation credits will be purchased from the Range-wide Indiana Bat In-Lieu Fee Program administered by The Conservation Fund. Therefore, no adverse impacts to federally threatened or endangered species are anticipated.
  - c. The proposed project would have no adverse impact upon archaeological remains or historic properties.
  - d. The proposed repairs would have no adverse impacts to the physical environment (e.g., noise, air and water quality) nor would the project adversely impact low-income or minority populations.
  - e. The road raise and relocation would require the placement of fill in wetlands, four improvements to existing stream crossing, and the clearing of four acres of bottomland hardwood forests. To offset the unavoidable impacts to aquatic resources, wetland and

stream mitigation credits would be purchased from a wetland mitigation bank and Missouri in-lieu fee program, respectively.

- f. The “No Action” alternative was evaluated and would be unacceptable to recommend as it does not meet the project purpose of relocating Highway D out of the inundation area.
4. Compliance with Section 404 of the Clean Water Act was coordinated with the USACE Regulatory Branch and Missouri Department of Natural Resources and will be achieved with the signing of this document and the 404(b)(1) Analysis. Compliance with Section 106 of the National Historic Preservation Act (NHPA) was achieved through coordination with the Missouri State Historic Preservation Office. The Fish and Wildlife Service reviewed the document during public review to ensure compliance with the Endangered Species Act and Fish and Wildlife Coordination Act. Compliance with the National Environmental Policy Act will be achieved with the signing of this document. The project is in compliance with all other applicable laws and regulations as documented in the Environmental Assessment.
5. Based on my analysis and evaluation of the alternative courses of action presented in the Environmental Assessment, I have determined that the implementation of the Tentatively Selected Plan would not have significant effects on the quality of the environment. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with this action.

---

(Date)

---

Bryan K. Sizemore  
Colonel, U.S. Army  
District Commander

## **APPENDIX A – COORDINATION**





## Missouri Department of Conservation

Missouri Department of Conservation's Mission is to protect and manage the forest, fish, and wildlife resources of the state and to facilitate and provide opportunities for all citizens to use, enjoy and learn about these resources.

### **Natural Heritage Review Level Three Report: Species Listed Under the Federal Endangered Species Act**

There are records for species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

**Foreword:** Thank you for accessing the Missouri Natural Heritage Review Website developed by the Missouri Department of Conservation with assistance from the U.S. Fish and Wildlife Service, the U.S. Army Corps of Engineers, Missouri Department of Transportation and NatureServe. The purpose of this website is to provide information to federal, state and local agencies, organizations, municipalities, corporations and consultants regarding sensitive fish, wildlife, plants, natural communities and habitats to assist in planning, designing and permitting stages of projects.

#### **PROJECT INFORMATION**

**Project Name and ID Number:** Wappapello Highway D Relocation #6155

**Project Description:** During period of high lake water levels, a 1.6 mile section of Missouri Highway D can become inundated by flood waters resulting in its closure. Missouri Highway D is a primary north-south transportation corridor that lies to the east of Wappapello Lake. In order to prevent the inundation, and subsequent closure, of Missouri Highway D, the USACE and Missouri Department of Transportation are proposing to raise the 1.6 mile section of highway to a minimum elevation of 405 feet. The primary purpose of the road raise/relocation project is to stop flooding of Missouri Highway D within the section identified in order to keep the roadway open during seasonal flooding events. A secondary purpose is to alleviate and allow greater flexibility in the ability of the project to regulate and or reduce flooding downstream of the dam.

**Project Type:** Transportation, Roads

**Contact Person:** Alison Anderson

**Contact Information:** Alison.M.Anderson@usace.army.mil or 314-331-8458

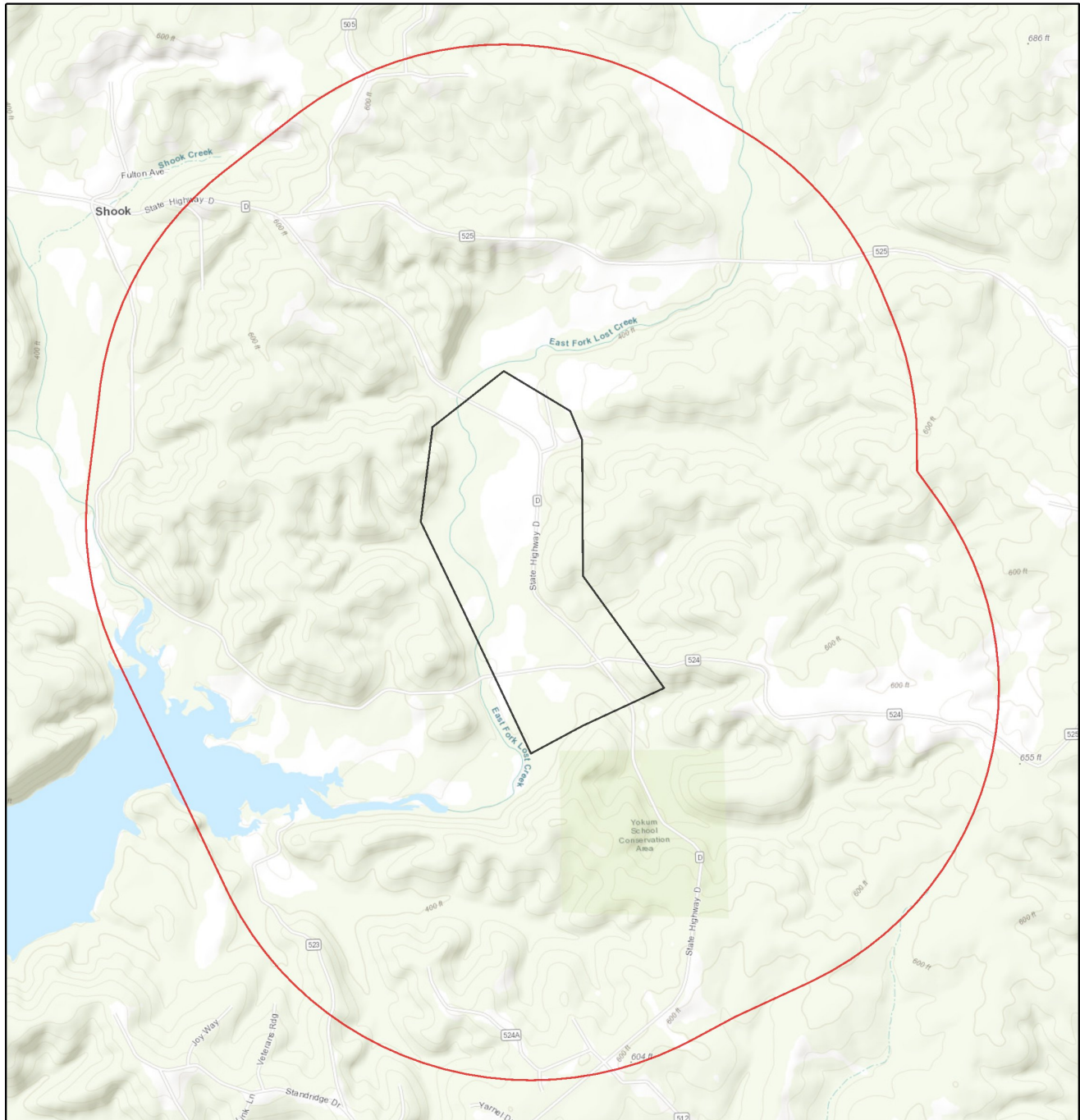
**Disclaimer:** The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive species or special habitats. If an occurrence record is present, or the proposed project might affect federally listed species, the user must contact the Department of Conservation or U.S. Fish and Wildlife Service for more information. The Natural Heritage Program tracks occurrences of sensitive species and natural communities where the species or natural community has been found. Lack of an occurrence record does not mean that a sensitive plant, animal or natural community is not present on or near the project area. Depending on the project, current habitat conditions, and geographic location in the state, surveys may be necessary. Additionally, because land use conditions change and animals move, the existence of an occurrence record does not mean the species/habitat is still present. Therefore, Reports include information about records near but not necessarily on the project site.

The Natural Heritage Report is not a site clearance letter for the project. It provides an indication of whether or not public lands and sensitive resources are known to be (or are likely to be) located close to the proposed project. Incorporating information from the Natural Heritage Program into project plans is an important step that can help reduce unnecessary impacts to Missouri's sensitive fish, forest and wildlife resources. However, the Natural Heritage Program is only one reference that should be used to evaluate potential adverse project impacts. Other types of information, such as wetland and soils maps and on-site inspections or surveys, should be considered. Reviewing current landscape and habitat information, and species' biological characteristics would additionally ensure that Missouri Species of Conservation Concern are appropriately identified and addressed in planning efforts.

**U.S. Fish and Wildlife Service – Endangered Species Act (ESA) Coordination:** Lack of a Natural Heritage Program occurrence record for federally listed species in your project area does not mean the species is not present, as the area may never have been surveyed. Presence of a Natural Heritage Program occurrence record does not mean the project will result in negative impacts. The information within this report is not intended to replace Endangered Species Act consultation with the U.S. Fish and Wildlife Service (USFWS) for listed species. Direct contact with the USFWS may be necessary to complete consultation and it is required for actions with a federal connection, such as federal funding or a federal permit; direct contact is also required if ESA concurrence is necessary. Visit the USFWS Information for Planning and Conservation (IPaC) website at <https://ecos.fws.gov/ipac/> for further information. This site was developed to help streamline the USFWS environmental review process and is a first step in ESA coordination. The Columbia Missouri Ecological Field Services Office may be reached at 573-234-2132, or by mail at 101 Park Deville Drive, Suite A, Columbia, MO 65203.

**Transportation Projects:** If the project involves the use of Federal Highway Administration transportation funds, these recommendations may not fulfill all contract requirements. Please contact the Missouri Department of Transportation at 573-526-4778 or [www.modot.mo.gov/ehp/index.htm](http://www.modot.mo.gov/ehp/index.htm) for additional information on recommendations.

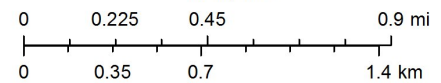
# Wappapello Highway D Relocation



August 23, 2019

1:27,078

- Project Boundary
- Buffered Project Boundary



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

## Species or Communities of Conservation Concern within the Area:

There are records for species listed under the Federal Endangered Species Act, and possibly also records for species listed Endangered by the state, or Missouri Species and/or Natural Communities of Conservation Concern within or near the the defined Project Area. Please contact the U.S. Fish and Wildlife Service and the Missouri Department of Conservation for further coordination.

MDC Natural Heritage Review  
Resource Science Division  
P.O. Box 180  
Jefferson City, MO  
65102-0180  
Phone: 573-522-4115 ext. 3182  
[NaturalHeritageReview@mdc.mo.gov](mailto:NaturalHeritageReview@mdc.mo.gov)

U.S. Fish and Wildlife Service  
Ecological Service  
101 Park Deville Drive  
Suite A  
Columbia, MO  
65203-0007  
Phone: 573-234-2132

## Other Special Search Results:

The project occurs on or near public land, WAPPAPELLO LAKE USACOE, Yokum School CA, please contact COE, MDC.

## Project Type Recommendations:

No recommendations have been identified for this project type.

## Project Location and/or Species Recommendations:

**Endangered Species Act Coordination - Indiana bats** (*Myotis sodalis*, federal- and state-listed endangered) and **Northern long-eared bats** (*Myotis septentrionalis*, federal-listed threatened) may occur near the project area. Both of these species of bats hibernate during winter months in caves and mines. During the summer months, they roost and raise young under the bark of trees in wooded areas, often riparian forests and upland forests near perennial streams. During project activities, avoid degrading stream quality and where possible leave snags standing and preserve mature forest canopy. Do not enter caves known to harbor Indiana bats or Northern long-eared bats, especially from September to April. **If any trees need to be removed for your project, please contact the U.S. Fish and Wildlife Service (Ecological Services, 101 Park Deville Drive, Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132 ext. 100 for Ecological Services) for further coordination under the Endangered Species Act.**

The project location submitted and evaluated is within the geographic range of nesting Bald Eagles in Missouri. Bald Eagles (*Haliaeetus leucocephalus*) may nest near streams or water bodies in the project area. Nests are large and fairly easy to identify. Adults begin nesting activity in late December and January and young birds leave the nest in late spring to early summer. While no longer listed as endangered, eagles continue to be protected by the federal government under the Bald and Golden Eagle Protection Act. Work managers should be alert for nesting areas within 1500 meters of project activities, and follow federal guidelines at: <http://www.fws.gov/midwest/MidwestBird/EaglePermits/index.html> if eagle nests are seen.

The project location submitted and evaluated is within the range of the Gray Myotis (i.e., Gray Bat) in Missouri. Depending on habitat conditions of your project's location, Gray Myotis (*Myotis grisescens*, federal and state-listed endangered) could occur within the project area, as they forage over streams, rivers, lakes, and reservoirs. Avoid entry or disturbance of any cave inhabited by Gray Myotis and when possible retain forest vegetation along the stream and from the cave opening to the stream. See <http://mdc.mo.gov/104> for best management recommendations.



**Invasive exotic species** are a significant issue for fish, wildlife and agriculture in Missouri. Seeds, eggs, and larvae may be moved to new sites on boats or construction equipment. Please inspect and clean equipment thoroughly before moving between project sites. See <http://mdc.mo.gov/9633> for more information.

- Remove any mud, soil, trash, plants or animals from equipment before leaving any water body or work area.
- Drain water from boats and machinery that have operated in water, checking motor cavities, live-well, bilge and transom wells, tracks, buckets, and any other water reservoirs.
- When possible, wash and rinse equipment thoroughly with hard spray or HOT water (?140° F, typically available at do-it-yourself car wash sites), and dry in the hot sun before using again.

**Streams and Wetlands – Clean Water Act Permits:** Streams and wetlands in the project area should be protected from activities that degrade habitat conditions. For example, soil erosion, water pollution, placement of fill, dredging, in-stream activities, and riparian corridor removal, can modify or diminish aquatic habitats. Streams and wetlands may be protected under the Clean Water Act and require a permit for any activities that result in fill or other modifications to the site. Conditions provided within the U.S. Army Corps of Engineers (USACE) Clean Water Act Section 404 permit (<http://www.nwk.usace.army.mil/Missions/RegulatoryBranch.aspx>) and the Missouri Department of Natural Resources (DNR) issued Clean Water Act Section 401 Water Quality Certification (<http://dnr.mo.gov/env/wpp/401/index.html>), if required, should help minimize impacts to the aquatic organisms and aquatic habitat within the area. Depending on your project type, additional permits may be required by the Missouri Department of Natural Resources, such as permits for stormwater, wastewater treatment facilities, and confined animal feeding operations. Visit <http://dnr.mo.gov/env/wpp/permits/index.html> for more information on DNR permits. Visit both the USACE and DNR for more information on Clean Water Act permitting.

For further coordination with the Missouri Department of Conservation and the U.S. Fish and Wildlife Services, please see the contact information below.

MDC Natural Heritage Review  
Resource Science Division  
P.O. Box 180  
Jefferson City, MO  
65102-0180  
Phone: 573-522-4115 ext. 3182  
[NaturalHeritageReview@mdc.mo.gov](mailto:NaturalHeritageReview@mdc.mo.gov)

U.S. Fish and Wildlife Service  
Ecological Service  
101 Park Deville Drive  
Suite A  
Columbia, MO  
65203-0007  
Phone: 573-234-2132

### Miscellaneous Information

FEDERAL Concerns are species/habitats protected under the Federal Endangered Species Act and that have been known near enough to the project site to warrant consideration. For these, project managers must contact the U.S. Fish and Wildlife Service Ecological Services (101 Park Deville Drive Suite A, Columbia, Missouri 65203-0007; Phone 573-234-2132; Fax 573-234-2181) for consultation.

STATE Concerns are species/habitats known to exist near enough to the project site to warrant concern and that are protected under the Wildlife Code of Missouri (RSMo 3 CSR 1 0). "State Endangered Status" is determined by the Missouri Conservation Commission under constitutional authority, with requirements expressed in the Missouri Wildlife Code, rule 3CSR 10-4.111. Species tracked by the Natural Heritage Program have a "State Rank" which is a numeric rank of relative rarity. Species tracked by this program and all native Missouri wildlife are protected under rule 3CSR 10-4.110 General Provisions of the Wildlife Code.

Additional information on Missouri's sensitive species may be found at <http://mdc.mo.gov/discover-nature/field-guide/endangered-species>. Detailed information about the animals and some plants mentioned may be accessed at [http://mdc4.mdc.mo.gov/applications/mofwis/mofwis\\_search1.aspx](http://mdc4.mdc.mo.gov/applications/mofwis/mofwis_search1.aspx). If you would like printed copies of best management practices cited as internet URLs, please contact the Missouri Department of Conservation.

**From:** [Matt Vitello](#)  
**To:** [Anderson, Alison M CIV \(USA\)](#)  
**Subject:** [Non-DoD Source] RE: Heritage Level 3 Report - Wappapello HWY D (UNCLASSIFIED)  
**Date:** Friday, October 4, 2019 1:37:26 PM

---

Hello Alison,

The Level 3 Report for this area is due to the occurrence of some bat species in the project vicinity:

- \* Gray Bat (*Myotis grisescens*, Fed and State endangered)
- \* Indiana Bat (*Myotis sodalist*, Fed and State endangered)
- \* Northern Long-eared Myotis (*Myotis septentrionalis*, State endangered, Fed threatened)

There are numerous State species and communities of conservation concern in the vicinity as well. Of most importance are a series of Ozark fens (State rank S2: Imperiled), known as Hattie's Ford Fens. These fens are close to the Hwy. D along a portion of the section identified in the Heritage Report. We would like to work with the USACE and MODOT as they plan for this road raise to minimize impacts to these fens. We could also work with staff on site to discuss solutions.

You can put me down as a contact. Staff that would be involved will be our Natural Communities Ecologist, Mike Leahy ([mike.leahy@mdc.mo.gov](mailto:mike.leahy@mdc.mo.gov) <<mailto:mike.leahy@mdc.mo.gov>> ) and our SE Region Natural History Biologist, Kevin Brunke ([kevin.brunke@mdc.mo.gov](mailto:kevin.brunke@mdc.mo.gov) <<mailto:kevin.brunke@mdc.mo.gov>> ).

Let me know if you have questions or need additional information.

Matt Vitello, P.E.

Policy Coordinator

Missouri Department of Conservation

573-522-4115 ext. 3191

[matt.vitello@mdc.mo.gov](mailto:matt.vitello@mdc.mo.gov) <<mailto:matt.vitello@mdc.mo.gov>>



-----Original Message-----

From: Anderson, Alison M CIV (USA) <Alison.M.Anderson@usace.army.mil>  
Sent: Friday, August 23, 2019 7:58 AM  
To: Matt Vitello <Matt.Vitello@mdc.mo.gov>  
Subject: Heritage Level 3 Report - Wappapello HWY D (UNCLASSIFIED)

CLASSIFICATION: UNCLASSIFIED

Hello Matt!

We are starting a USACE project at Wappapello Lake regarding the relocation/raise of Highway D. We are still in alternatives development for this project. The Natural Heritage Review indicates a Level 3 report for this area.

Please let me know if MDC has any resources of concern within the project area.

Thanks,

Alison

Alison Anderson, Ph.D.

Aquatic Ecologist

U.S. Army Corps of Engineers

St. Louis District

Regional Planning and Environmental Division-North Environmental Compliance Section CEMVP-PD-C

Office: (314) 331-8458

Cell: (419) 305-4167

CLASSIFICATION: UNCLASSIFIED



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
Missouri Ecological Services Field Office  
101 Park Deville Drive  
Suite A  
Columbia, MO 65203-0057  
Phone: (573) 234-2132 Fax: (573) 234-2181

In Reply Refer To:

January 27, 2020

Consultation Code: 03E14000-2019-SLI-2587

Event Code: 03E14000-2020-E-02553

Project Name: Wappapello Highway D Road Relocation/Raise

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

## Threatened and Endangered Species

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. **Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days.** The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

## Consultation Technical Assistance

Refer to the Midwest Region [S7 Technical Assistance](#) website for step-by-step instructions for making species determinations and for specific guidance on the following types of projects: projects in developed areas, HUD, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

### Federally Listed Bat Species

Indiana bats, gray bats, and northern long-eared bats occur throughout Missouri and the information below may help in determining if your project may affect these species.

*Gray bats* - Gray bats roost in caves or mines year-round and use water features and forested riparian corridors for foraging and travel. If your project will impact caves, mines, associated riparian areas, or will involve tree removal around these features particularly within stream corridors, riparian areas, or associated upland woodlots gray bats could be affected.

*Indiana and northern long-eared bats* - These species hibernate in caves or mines only during the winter. In Missouri the hibernation season is considered to be November 1 to March 31. During the active season in Missouri (April 1 to October 31) they roost in forest and woodland habitats. Suitable summer habitat for Indiana bats and northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags 5 inches diameter at breast height (dbh) for Indiana bat, and 3 inches dbh for northern long-eared bat, that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Tree species often include, but are not limited to, shellbark or shagbark hickory, white oak, cottonwood, and maple. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of other forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, Indiana bats or northern long-eared bats could be affected.

Examples of unsuitable habitat include:

- Individual trees that are greater than 1,000 feet from forested or wooded areas;
  - Trees found in highly-developed urban areas (e.g., street trees, downtown areas);
  - A pure stand of less than 3-inch dbh trees that are not mixed with larger trees; and
  - A stand of eastern red cedar shrubby vegetation with no potential roost trees.
-

## Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example ["No Effect" document](#) also can be found on the S7 Technical Assistance website.

2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project other than bats (see #3 below) then project proponents can conclude the proposed activities **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain [Life History Information for Listed and Candidate Species](#) through the S7 Technical Assistance website.

3. If IPaC returns a result that one or more federally listed bat species (Indiana bat, northern long-eared bat, or gray bat) are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** these bat species **IF** one or more of the following activities are proposed:

- a. Clearing or disturbing suitable roosting habitat, as defined above, at any time of year;
- b. Any activity in or near the entrance to a cave or mine;
- c. Mining, deep excavation, or underground work within 0.25 miles of a cave or mine;
- d. Construction of one or more wind turbines; or
- e. Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on listed bat species. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records. An example ["No Effect" document](#) also can be found on the S7 Technical Assistance website.

If any of the above activities are proposed in areas where one or more bat species may be present, project proponents can conclude the proposed activities **may affect** one or more bat species. We recommend coordinating with the Service as early as possible during project planning. If your project will involve removal of over 5 acres of suitable forest or woodland habitat, we recommend you complete a Summer Habitat Assessment prior to contacting our office to expedite the consultation process. The Summer Habitat Assessment Form is available in Appendix A of the most recent version of the [Range-wide Indiana Bat Summer Survey Guidelines](#).

## Other Trust Resources and Activities

---

*Bald and Golden Eagles* - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

*Migratory Birds* - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

*Communication Towers* - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed [voluntary guidelines for minimizing impacts](#).

*Transmission Lines* - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to [guidelines](#) developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

*Wind Energy* - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's [Wind Energy Guidelines](#). In addition, please refer to the Service's [Eagle Conservation Plan Guidance](#), which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

### Next Steps

Should you determine that project activities **may affect** any federally listed species or trust resources described herein, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

If you have not already done so, please contact the Missouri Department of Conservation (Policy Coordination, P. O. Box 180, Jefferson City, MO 65102) for information concerning Missouri Natural Communities and Species of Conservation Concern.

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

---

Karen Herrington

Attachment(s):

- Official Species List
  - USFWS National Wildlife Refuges and Fish Hatcheries
  - Wetlands
-

# Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

**Missouri Ecological Services Field Office**

101 Park Deville Drive

Suite A

Columbia, MO 65203-0057

(573) 234-2132

---



## Project Summary

Consultation Code: 03E14000-2019-SLI-2587

Event Code: 03E14000-2020-E-02553

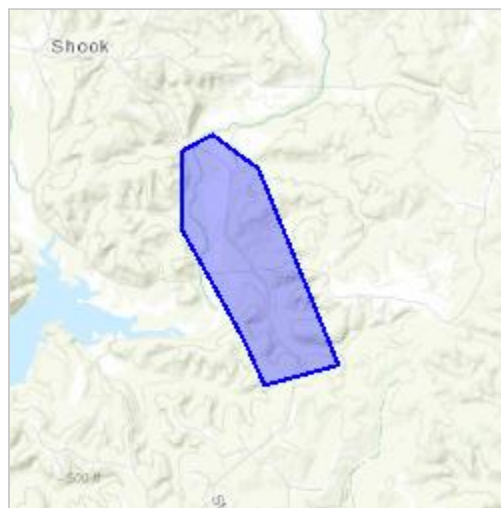
Project Name: Wappapello Highway D Road Relocation/Raise

Project Type: TRANSPORTATION

Project Description: USACE in conjunction with MoDOT is evaluating alternatives to raise this portion of Highway D. Highway D at this location goes underwater during periods when water levels at Wappapello Lake are high.

Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/place/37.02254712471602N90.28342771858834W>



Counties: Wayne, MO

---

## Endangered Species Act Species

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

- 
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

## Mammals

NAME	STATUS
Gray Bat <i>Myotis grisescens</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/6329">https://ecos.fws.gov/ecp/species/6329</a>	Endangered
Indiana Bat <i>Myotis sodalis</i> There is <b>final</b> critical habitat for this species. Your location is outside the critical habitat. Species profile: <a href="https://ecos.fws.gov/ecp/species/5949">https://ecos.fws.gov/ecp/species/5949</a>	Endangered
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

## Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

---

# USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

---

# Wetlands

Impacts to [NWI wetlands](#) and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local [U.S. Army Corps of Engineers District](#).

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

## FRESHWATER EMERGENT WETLAND

- [PEM1C](#)

## FRESHWATER FORESTED/SHRUB WETLAND

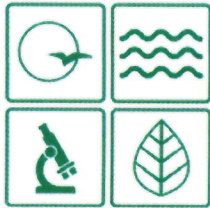
- [PFO1A](#)

## FRESHWATER POND

- [PUBGh](#)

## RIVERINE

- [R2UBH](#)
  - [R4SBC](#)
  - [R5UBH](#)
-



Missouri Department of dnr.mo.gov  
**NATURAL RESOURCES**

Michael L. Parson, Governor

Carol S. Comer, Director

April 2, 2019

Ms. Rochelle R. Hance  
Chief, Curation and Archives Analysis Branch  
U.S. Army Corps of Engineers, St. Louis District  
1222 Spruce Street  
St. Louis, Missouri 63103-2833

Re: **SHPO Project Number: 004-WE-19** – Route D Realignment at Lake Wappapello,  
Wayne County, Missouri

Dear Ms. Hance:

Thank you for submitting information on the above referenced project for our review pursuant to Section 106 of the National Historic Preservation Act (P.L. 89-665, as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, which requires identification and evaluation of cultural resources.

We have reviewed the report entitled *Cultural Resource Survey for the Proposed Improvements to Route D near Lake Wappapello in Wayne County, Missouri* by Archaeological Research Center of St. Louis. Based on this review it is evident that a thorough and adequate cultural resources survey has been conducted of the project area. Therefore, we concur with your recommendation that site 23WE2250 should be considered not eligible for the National Register of Historic Places. Therefore we concur with your determination that there will be **no historic properties affected**, and have no objection to the initiation of project activities.

If project plans change, please send additional information documenting the revisions for further review. In the event that cultural materials are encountered during project activities, all construction should be halted, and this office notified as soon as possible in order to determine the appropriate course of action.

Ms. Hance

Page 2

If you have any questions, please write the State Historic Preservation Office, P.O. Box 176, Jefferson City, Missouri 65102 attention Review and Compliance, or call Amy Rubingh at (573) 751-4589. Please be sure to include the SHPO Log Number (004-WE-19) on all future correspondence or inquiries relating to this project.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

*Toni M. Prawl*

Toni M. Prawl, Ph.D.  
Director and Deputy State  
Historic Preservation Officer



TMP:ar

C: Ms. Raegan Ball, FHWA  
Mr. Taylor Peters, FHWA



**DEPARTMENT OF THE ARMY**  
**U.S. ARMY CORPS OF ENGINEERS, ST. LOUIS DISTRICT**  
**1222 SPRUCE STREET**  
**ST. LOUIS, MISSOURI 63103-2833**

6 March 2019

REPLY TO  
ATTENTION OF:

Engineering and Construction Division  
Curation and Archives Analysis Branch

Governor Edwina Butler-Wolfe  
Absentee-Shawnee Tribe of Indians of Oklahoma  
2025 S. Gordon Cooper Driver  
Shawnee, OK 74810-9381

Subject: Rerouting Route D, Wayne County, Missouri

Dear Governor Butler-Wolfe:

We are contacting your tribe to initiate consultation in accordance with Section 106 of the National Historic Preservation Act of 1964, as amended, for the proposed relocation of a section of Route D, in Wayne County, Missouri. Further, a draft Environmental Assessment is currently being prepared per the National Environmental Policy Act of 1970. As a result of the impoundment of Wappapello Lake, flooding can make portions of Route D impassable during high water events. To address this issue, the St. Louis District (District) is investigating the possibility of relocating a section of Route D to reduce the amount of time that the road is impassable during high water.

This project is being undertaken in partnership with the Missouri Department of Transportation (MODOT). MODOT contracted to have a Phase I archaeological survey performed along the proposed realignment. The archaeological survey report was submitted to our office for review and is being submitted to the Missouri State Historic Preservation Office. A copy of the report is enclosed. The District has reviewed the report and concurs with the findings of the archaeological contractor. It is the District's current opinion that the proposed project will have no significant effect on historic properties.

If your tribe has any questions or comments, please contact me at (314) 331-8784, or Chris Koenig (Archaeologist and Tribal Liaison) at 314-331-8151, or [christopher.j.koenig@usace.army.mil](mailto:christopher.j.koenig@usace.army.mil).

Sincerely,

Rochelle R. Hance  
Chief, Curation and Archives Analysis Branch

Enclosures

# Tribal leaders

Title	Name (First, Middle, Last)	Tribes	Street Address	Street Address	City	State	Zipcode
Governor	Edwina Butler-Wolfe	Absentee-Shawnee Tribe of Indian of Oklahoma	2025 S. Gordon Cooper Drive		Shawnee	OK	74810-9381
Chairman	John Barrett	Citizen Potawatomi Nation, Oklahoma	1601 S. Gordon Cooper Drive		Shawnee	OK	74801
President	Deborah Dotson	Delaware Nation, Oklahoma	P.O. Box 825		Anadarko	OK	73005
Chief	Chester Brooks	Delaware Tribe of Indians	5100 Tuxedo Boulevard		Bartlesville	OK	74006
Chief	Chester Brooks	Delaware Tribe of Indians	5100 Tuxedo Boulevard		Bartlesville	OK	74006
Chief	Glenna J. Wallace	Eastern Shawnee Tribe of Oklahoma	P.O. Box 350		Seneca	MO	64865
Chairman	Ned Daniels	Forest County Potawatomi Community, Wisconsin	P.O. Box 340		Crandon	WI	54520
Chairman	Kenneth Meshigaud	Hannahville Indian Community, Michigan	N 14911 Hannahville B-1 Road		Wilson	MI	49896-9728
President	Wilford Cleveland	Ho-Chunk Nation of Wisconsin	P.O. Box 667		Black River Falls	WI	54675
Chairman	Tim Rhodd	Iowa Tribe of Kansas and Nebraska	3345 Thrasher Road, #8		White Cloud	KS	66094
Chairman	Bobby Walkup	Iowa Tribe of Oklahoma	Route 1, Box 721		Perkins	OK	74059
Chairman	Lester Randall	Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas	P.O. Box 271		Horton	KS	66439
Chairman	David Pacheco	Kickapoo Tribe of Oklahoma	P.O. Box 70		McCloud	OK	74851
Chairman	Scott Sprague	Match-e-be-nash-she-wish Band of Potawatomi Indians of Michigan	2872 Mission Dr.		Shelbyville	MI	49344
Chief	Douglas Lankford	Miami Tribe of Oklahoma	202 S. Eight Tribes Trail	P.O. Box 1326	Miami	OK	74355
Chairman	Jamie Stuck	Nottawaseppi Huron Band of the Potawatomi, Michigan	2221—1 & 1/2 Mile Road		Fulton	MI	49052
Chief	Craig Harper	Peoria Tribe of Indians of Oklahoma	118 S. Eight Tribes Trail	P.O. Box 1527	Miami	OK	74355
Chairman	John P. Warren	Pokagon Band of Potawatomi Indians, Michigan and Indiana	P.O. Box 180	58620 Sink Road	Dowagiac	MI	49047
Chairwoman	Liana Onnen	Prairie Band Potawatomi Nation	Government Center	16281 Q Road	Mayetta	KS	66509
Chairperson	Tiauna Carnes	Sac & Fox Nation of Missouri in Kansas and Nebraska	305 N. Main Street		Reserve	KS	66434
Principal Chief	Kay Rhoads	Sac & Fox Nation, Oklahoma	920883 S Highway 99	Building A	Stroud	OK	74079
Chairman	Anthony Waseskuk	Sac & Fox Tribe of the Mississippi in Iowa	349 Meskwaki Road		Tama	IA	52339
Chairman	Ron Sparkman	Shawnee Tribe	P.O. Box 189		Miami	OK	74355
Principal Chief	Geoffrey Standing Bear	The Osage Nation	P.O. Box 779		Pawhuska	OK	74056
Chairman	John Berrey	The Quapaw Tribe of Indians	P.O. Box 765		Quapaw	OK	74363
Chief	Joe Bunch	United Keetoowah Band of Cherokee of Oklahoma	P.O. Box 746		Tahlequah	OK	74464
Chairman	Frank White	Winnebago Tribe of Nebraska	P.O. Box 687		Winnebago	NE	68071
Chairman	Tamara Francis	Caddo Nation of Oklahoma	P.O. Box 487		Binger	OK	73009



## Cultural Reps

Name (First, Middle, Last)	Position	Tribe	Street Address	Street Address 2	City	State	Zipcode
Devon Frazier	Tribal Historic Preservation Officer	Absentee-Shawnee Tribe of Indians of Oklahoma	2025 S. Gordon Cooper Drive		Shawnee	OK	74810-9381
Kelli Mosteller	Tribal Historic Preservation Officer	Citizen Potawatomi Nation, Oklahoma	Cultural Heritage Center	1601 S. Gordon Cooper Drive	Shawnee	OK	74801
Sonnie Allen	Director of Cultural Preservation	Delaware Nation, Oklahoma	P.O. Box 825		Anardarko	OK	73005
Brice Obermeyer	Tribal Historic Preservation Officer	Delaware Tribe of Indians	Roosevelt Hall, Room 212	1 Kellogg Circle	Emporia	KS	66801
Larry Heady	THPO Special Assistant	Delaware Tribe of Indians	1929 E. 6th ST		Duluth	MN	55812
Brett Barnes	Historic Preservation Office	Eastern Shawnee Tribe of Oklahoma	P.O. Box 350		Seneca	MO	64865
Melissa Cook	Tribal Historic Preservation Officer	Forest County Potawatomi Community, Wisconsin	Cultural Center, Library & Museum	8130 Mishkoswen Drive, P.O. Box 340	Crandon	WI	54520
Earl Meshigaud	Historic Preservation Office	Hannahville Indian Community, Michigan	P.O. Box 351, Highway 2 & 41		Harris	MI	49845
William Quackenbush	Tribal Historic Preservation Officer	Ho-Chunk Nation of Wisconsin	P.O. Box 667		Black River Falls	WI	54675
Lance Foster	Tribal Historic Preservation Officer	Iowa Tribe of Kansas and Nebraska	3345 Thrasher Road		White Cloud	KS	66094
Robert Fields	Historic Preservation Office	Iowa Tribe of Oklahoma	Route 1, Box 721		Perkins	OK	74059
Fred Thomas	Vice Chair	Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas	P.O. Box 271		Horton	KS	66439
Kent Collier	Historic Preservation Office	Kickapoo Tribe of Oklahoma	P.O. Box 70		McCloud	OK	74851
Sydney Martin	Historic Preservation Office	Match-e-be-nash-she-wish Band of Potawatomi Indians of Michigan	2872 Mission Drive		Shelbyville	MI	49344
Diane Hunter	Tribal Historic Preservation Officer	Miami Tribe of Oklahoma	202 S. Eight Tribes Trail	P.O. Box 1326	Miami	OK	74355
Fred Jacko, JR	Culture Department Manager	Nottawaseppi Huron Band of the Potawatomi, Michigan	2221—1 1/2 Mile Road		Fulton	MI	49052
Logan Pappenfort	Historic Preservation Office	Peoria Tribe of Indians of Oklahoma	118 S. Eight Tribes Trail	P.O. Box 1527	Miami	OK	74355
Matthew Bussler	Tribal Historic Preservation Officer	Pokagon Band of Potawatomi Indians, Michigan and Indiana	P.O. Box 180	58620 Sink Road	Dowagiac	MI	49047
Warren Wahweotten	Tribal Council Member	Prairie Band Potawatomi Nation	Government Center	16281 Q Road	Mayetta	KS	66509
Lisa Montgomery	Environmental Protection Agency Director	Sac & Fox Nation of Missouri in Kansas and Nebraska	305 N. Main Street		Reserve	KS	66434
Historic Preservation Office	NAGPRA/Historic Preservation Office	Sac & Fox Nation, Oklahoma	920883 S. Highway 99	Building A	Stroud	OK	74079
Johnathan Buffalo	Historic Preservation Office	Sac & Fox Tribe of the Mississippi in Iowa	349 Meskwaki Road		Tama	IA	52339
Tonya Tipton	Historic Preservation Office	Shawnee Tribe	P.O. Box 189		Miami	OK	74355
Andrea Hunter	Historic Preservation Office	The Osage Nation	627 Grandview Avenue		Pawhuska	OK	74056
Everett Bandy	Tribal Historic Preservation Officer	The Quapaw Tribe of Indians	P.O. Box 765		Quapaw	OK	74363
Sheila Bird	Tribal Historic Preservation Officer	United Keetoowah Band of Cherokee of Oklahoma	P.O. Box 746		Tahlequah	OK	74464
Randy Tebeo	Tribal Historic Preservation Officer	Winnebago Tribe of Nebraska	P.O. Box 687		Winnebago	NE	68071
Tribal Historic Preservation Office	Tribal Historic Preservation Officer	Caddo Nation of Oklahoma	117 Memorial Lane	P.O. Box 487	Binger	OK	73009



## Osage Nation Historic Preservation Office

HAZAZA BOSN BNEPA

Date: June 10, 2019

File: 1819-3290MO-3

RE: USACE, St. Louis District, Rerouting Route D, Wayne County, Missouri

St. Louis District, USACE  
Rochelle R. Hance  
1222 Spruce Street  
St. Louis, MO 63103-2833

Dear Ms. Hance,

The Osage Nation Historic Preservation Office has evaluated your submission regarding the proposed USACE, St. Louis District, Rerouting Route D, Wayne County, Missouri and determined that the proposed project **most likely will not adversely affect any sacred properties and/or properties of cultural significance to the Osage Nation.** For direct effect, the finding of this NHPA Section 106 review is a determination of "No Properties" eligible or potentially eligible for the National Register of Historic Places.

In accordance with the National Historic Preservation Act, (NHPA) [54 U.S.C. § 300101 et seq.] 1966, undertakings subject to the review process are referred to in 54 U.S.C. § 302706 (a), which clarifies that historic properties may have religious and cultural significance to Indian tribes. Additionally, Section 106 of NHPA requires Federal agencies to consider the effects of their actions on historic properties (36 CFR Part 800) as does the National Environmental Policy Act (43 U.S.C. 4321 and 4331-35 and 40 CFR 1501.7(a) of 1969). **The Osage Nation concurs that the U.S. Army Corps of Engineers fulfilled NHPA compliance by consulting with the Osage Nation Historic Preservation Office in regard to the proposed project referenced as USACE, St. Louis District, Rerouting Route D, Wayne County, Missouri .**

The Osage Nation has vital interests in protecting its historic and ancestral cultural resources. We do not anticipate that this project will adversely impact any cultural resources or human remains protected under the NHPA, NEPA, the Native American Graves Protection and Repatriation Act, or Osage law. **If, however, artifacts or human remains are discovered during project construction, we ask that work cease immediately and the Osage Nation Historic Preservation Office be contacted.**

Should you have any questions or need any additional information please feel free to contact me at the number listed below. Thank you for consulting with the Osage Nation on this matter.

Andrea A. Hunter, Ph.D.  
Director, Tribal Historic Preservation Officer

Jess G. Hendrix  
Archaeologist

## **Allen, Teresa C (Teri) CIV USARMY CEMVS (USA)**

---

**From:** Koenig, Christopher J Jr CIV (US)  
**Sent:** Monday, March 25, 2019 1:50 PM  
**To:** Barnes, James CIV USARMY CEMVS (US); Allen, Teresa C (Teri) CIV USARMY CEMVS (USA)  
**Cc:** Hance, Rochelle R CIV USARMY CEMVS (US); Vanarsdale, Cathy A CIV USARMY CEMVS (USA)  
**Subject:** FW: Rerouting Route D, Wayne County, Mo

Jim and Teri – FYSA and files.

Thanks,

Christopher Koenig, M.A., RPA  
Archaeologist and Tribal Liaison  
USACE St. Louis District  
MCX-CMAC-EC-Z  
1222 Spruce Street  
St. Louis, MO 63103  
Office: 314-331-8151  
Work Cell: 314-356-0483  
[Christopher.J.Koenig@usace.army.mil](mailto:Christopher.J.Koenig@usace.army.mil)

---

**From:** Tonya Tipton [<mailto:tonya@shawnee-tribe.com>]  
**Sent:** Thursday, March 21, 2019 3:02 PM  
**To:** Koenig, Christopher J Jr CIV (US) <[Christopher.J.Koenig@usace.army.mil](mailto:Christopher.J.Koenig@usace.army.mil)>  
**Subject:** [Non-DoD Source] Rerouting Route D, Wayne County, Mo

This letter is in response to the above referenced project.

The Shawnee Tribe's Tribal Historic Preservation Department concurs that no known historic properties will be negatively impacted by this project.

We have no issues or concerns at this time, but in the event that archaeological materials are encountered during construction, use, or maintenance of this location, please re-notify us at that time as we would like to resume immediate consultation under such a circumstance.

If you have any questions, you may contact me via email at [tonya@shawnee-tribe.com](mailto:tonya@shawnee-tribe.com)

Thank you for giving us the opportunity to comment on this project.

Sincerely,

Tonya Tipton

Shawnee Tribe-THPO



29 S Highway 69A  
Miami, OK 74354  
Phone:(918)542-2441  
Fax: (918)542-2922  
[tonya@shawnee-tribe.com](mailto:tonya@shawnee-tribe.com)



**Delaware Tribe Historic Preservation Office**

1 Kellogg Circle  
Roosevelt Hall, RM 212  
Emporia State University  
Emporia, KS 66801  
(620) 341-6699

[bobermeyer@delawaretribe.org](mailto:bobermeyer@delawaretribe.org)

March 25, 2019

U.S. Army Corps of Engineers, St. Louis District  
Attn: Rochelle R. Hance  
1222 Spruce Street  
St. Louis, Missouri 63103

Re: Rerouting Route D, Wayne County, Missouri

Dear Rochelle R. Hance:

Thank you for providing the survey report documenting the discovery of the archaeological site(s) during the mitigation for the above referenced project. We agree that the site(s) is (are) not archaeologically significant. Our review also indicates that there are no religious or culturally significant sites in the project area and we have no objection to the proposed modified project.

However, we ask that if any human remains are accidentally unearthed during the course of the project that you cease development immediately and inform the Delaware Tribe of Indians of the inadvertent discovery.

If you have any questions, feel free to contact this office by phone at (620) 341-6699 or by e-mail at [bobermeyer@delawaretribe.org](mailto:bobermeyer@delawaretribe.org).

Sincerely,

Brice Obermeyer  
Delaware Tribe Historic Preservation Office  
1 Kellogg Drive  
Roosevelt Hall, Room 212  
Emporia, KS 66801



**EASTERN SHAWNEE**  
**CULTURAL PRESERVATION DEPARTMENT**

12755 S. 705 Road, Wyandotte, OK 74370

May 13, 2019

Department of the Army St. Louis District Corps of Engineers  
1222 Spruce Street  
St. Louis, MO 63103-2833

**RE: Rerouting Route D, Wanye County, MO**

Dear Mr. Koenig,

The Eastern Shawnee Tribe has received your letter regarding the above referenced project(s) within Wanye County, MO. The Eastern Shawnee Tribe is committed to protecting sites important to Tribal Heritage, Culture and Religion. Furthermore, the Tribe is particularly concerned with historical sites that may contain but not limited to the burial(s) of human remains and associated funerary objects.

As described in your correspondence, and upon research of our database(s) and files, we find our people occupied these areas historically and/or prehistorically. However, the project proposes **NO Adverse Effect** or endangerment to known sites of interest to the Eastern Shawnee Tribe. Please continue project as planned. However, should this project inadvertently discover an archeological site or object(s) we request that you immediately contact the Eastern Shawnee Tribe, as well as the appropriate state agencies (within 24 hours). We also ask that all ground disturbing activity stop until the Tribe and State agencies are consulted. Please note that any future changes to this project will require additional consultation.

In accordance with the NHPA of 1966 (16 U.S.C. § 470-470w-6), federally funded, licensed, or permitted undertakings that are subject to the Section 106 review process must determine effects to significant historic properties. As clarified in Section 101(d)(6)(A-B), historic properties may have religious and/or cultural significance to Indian Tribes. Section 106 of NHPA requires Federal agencies to consider the effects of their actions on all significant historic properties (36 CFR Part 800) as does the National Environmental Policy Act of 1969 (43 U.S.C. § 4321-4347 and 40 CFR § 1501.7(a)). This letter evidences NHPA and NEPA historic properties compliance pertaining to consultation with this Tribe regarding the referenced proposed projects.

Thank you, for contacting the Eastern Shawnee Tribe, we appreciate your cooperation. Should you have any further questions or comments please contact our Office.

Sincerely,

Tribal Historic Preservation Officer (THPO)  
Eastern Shawnee Tribe of Oklahoma  
(918) 666-5151 Ext:1845





## *The Delaware Nation*

### **Cultural Resources /106 Department**

31064 State Highway 281

Anadarko, OK 73005

Phone (405)247-2448 Fax (405) 247-8905

---

June 6, 2019

To Whom It May Concern:

The Delaware Nation Cultural Preservation Department received correspondence regarding the following referenced project(s).

**Project: Rerouting Route D, Wayne County, Missouri.**

Our office is committed to protecting tribal heritage, culture and religion with particular concern for archaeological sites potentially containing burials and associated funerary objects.

The Lenape people occupied the area indicated in your letter during prior to European contact until their eventual removal to our present locations. According to our files, the location of the proposed project does not endanger cultural, or religious sites of interest to the Delaware Nation. **Please continue with the project as planned** keeping in mind during construction should an archaeological site or artifacts inadvertently be uncovered, all construction and ground disturbing activities should immediately be halted until the appropriate state agencies, as well as this office, are notified (within 24 hours), and a proper archaeological assessment can be made.

Please note the Delaware Nation, the Delaware Tribe of Indians, and the Stockbridge Munsee Band of Mohican Indians are the only Federally Recognized Delaware/Lenape entities in the United States and consultation must be made only with designated staff of these three tribes. We appreciate your cooperation in contacting the Delaware Nation Cultural Preservation Office to conduct proper Section 106 consultation. Should you have any questions, feel free to contact our offices at 405/247-2448.

**Nekole Alligood**

NAGPRA Projects Officer

The Delaware Nation

31064 State Highway 281

Anadarko, OK 73005

Ph. 405-247-2448

nalligood@delawarenation.com

**MVS External Agency Stakeholder**

Environmental Protection Agency, Region 5  
Melgin, Wendy

Environmental Protection Agency, Region 7  
Westlake, Kenneth

Illinois State Employees

Carney, Doug  
Grider, Nathan  
Mauer, Paul  
Rawe, Adam

Minnesota

Amato, Joel

Missouri Dept. of Conservation

Boaz, Tracy  
Brown, Doyle  
Leary, Alan  
Sternburg, Janet  
Todd, Brian  
Campbell-Allison, Jennifer  
Vitello, Matt

Missouri Dept. of Natural Resources - Policy  
Unit

Beres, Audrey

Missouri Dept. of Natural Resources, Water  
Protection Program

Bax, Stacia

Missouri Dept. of Natural Resources - State  
Historic Preservation Office

Rubingh, Amy

National Oceanic and Atmospheric  
Administration

Buan, Steve

National Park Service

Lange, James

U.S. Fish and Wildlife Service, Missouri Office

Marquardt, Shauna  
Ledwin, Jane  
Herrington, Karen

U.S. Coast Guard

Morgan, Justin  
SUMR Waterways

U.S. Fish and Wildlife Service, Illinois Office

Mangan, Matthew  
McPeck, Kraig

U.S. Department of Agriculture-NRCS, MO  
Office

Lugo-Camacho, Jorge

**MVS External Educational Stakeholder**

Washington University

Goode, Peter  
Hubertz, Elizabeth  
Lipeles, Maxie  
Mannion, Clare  
Miller, Kenneth

**MVS External Environmental Stakeholder**

Ducks Unlimited

Held, Eric  
Hillburn, Craig

Great Rivers Habitat Alliance

Stokes, David

Great Rivers Law

Morrison, Bruce  
Skrukud, Cindy

Missouri Coalition for the Environment

Fung, Jenny

**MVS External Government Stakeholder**

Academy Coordinator for Congresswoman Ann  
Wagner

Winship, Jaci

City of Portage des Sioux

Field Representative Manager for Congressman  
Sam Graves

Josh Hurlbert

Jefferson County, Missouri

Luchan, Janice

Staff Member with Senator Roy Blunt's Office

Lavalle, Tricia

**MVS External Industry Stakeholder**

American Waterways Operators (AWO)

Muench, Lynn  
Werner, Paul

Tow Inc.

Alter Logistics

G, Jeff

Apex Oil Company

Caito, J  
Hanneman, M

Archer Daniels Midland (ADM)

Burlingame, Chuck  
Heroff, Bernard  
Porter, Jason

Atlantic-Meeco Inc.

Fabrizio, Christi

Canal Barge Company

Popplewell, Micket  
Tyson, J

Chain of Rocks WTP

Baldera, Patrick



Consolidated Grain & Barge Co. (CGB)  
Jamison, Larry  
Cultural Resource Analysts, Inc.  
Niquette, Charles  
Docks  
Economy Boat Store  
Zupan, T  
Ecosystem Investment Partners  
Urban, David  
Ecosystems Insurance Associates  
Spoth, Robert  
Ergon Inc.  
Cruse, Lester  
Florida Marine  
Marine, Louis  
Gary Elmestad & Associates  
Elmestad, Gary  
Hanke Terminal Inc.  
HMT Bell South  
Hoppies Marine  
Illinois Marine Towing  
Barnes, Ryan  
Ingram Barge Company  
Dotts, Glenn  
Henleben, Ed  
Johnson, Frank  
Kristen, John  
International Dock Products  
Teah, Phillip  
J.F. Brennan Company Inc.  
Pehler, Kent  
JBS USA  
JBS Chief  
Kirby Corporation  
Ebey, Mike  
Koch Industries  
Muir, T  
Layne  
Hunt, Henry  
Luhr Bros., Inc.  
S, Glenn  
Missouri Corn Grower's Assoc.  
Reitz & Jens  
SCI Engineering  
Harding, Scott  
SEACOR Marine LLC  
Coder, Justin  
Slay Industries Inc.  
Slay, Glen  
Southeast Missouri Port Authority  
Southern Illinois Transfer

Terra Technologies  
Staten, Shane  
Treated Wood Council  
Miller, Jeff  
Tri City Port District  
Shahman, Bill  
Wilmsmeyer, Dennis  
York Bridge Co.  
Southwestern Power Administration (SWPA)  
Corker, Ashley  
BellSouth Telecommunications

#### **MVS External Media Stakeholder**

Banner Press  
Chicago Commods  
Republic Monitor Perry County, MO  
Cox, Robert  
Waterways Journal  
Shoulberg, J

#### **MVS External Tribe Stakeholder**

Absentee-Shawnee Tribe  
Devon Frazier  
Caddo Nation  
Historic Preservation Office  
Chairman of Caddo Nation  
Francis, Tamara  
Citizen Potawatomi Nation  
Kelli Mosteller  
Delaware Nation of Oklahoma  
Sonnie Allen  
Delaware Tribe of Indians  
Dr. Brice Obermeyer  
Dr. Larry Heady  
Eastern Shawnee Tribe of Oklahoma  
Brett Barnes  
Forest County Potawatomi  
Melissa Cook  
Hannahville Indian Community  
Earl Meshigaud  
Ho-Chunk Nation of Wisconsin  
William Quackenbush  
Iowa Tribe of Kansas and Nebraska  
Lance Foster  
Iowa Tribe of Oklahoma  
Dr. Robert Fields  
Kickapoo Tribe of Indians of Kansas  
Fred Thomas  
Kickapoo Tribe of Oklahoma  
Kent Collier  
Miami Tribe of Oklahoma

Diane Hunter  
Nottawaseppi Band of Huron Potawatomi  
Fred Jacko, JR  
Peoria Tribe of Indians of Oklahoma  
Logan Pappenfort  
Pokagon Band of Potawatomi  
Matthew Bussler  
Prairie Band Potawatomi Nation  
Warren Wahweotten  
Sac & Fox Nation of Missouri in Kansas and  
Nebraska  
Chairperson Tiauna Carnes  
Sac & Fox Nation of Oklahoma  
Principal Chief Kay Rhoads  
Sac & Fox Tribe of the Mississippi in Iowa  
Buffalo, Jonathon  
Shawnee Tribe  
Tonya Tipton  
SOARRING Foundation  
Joseph Standing Bear Schranz  
The Osage Nation  
Chief John Red  
Dr. Andrea Hunter  
The Quapaw Tribe of Indians  
Everett Bandy  
United Keetoowah Band of Cherokee of  
Oklahoma  
Sheila Bird  
Winnebago Tribe of Nebraska  
Randy Tebeo

**Other External Stakeholders**

Adrian, D  
Andria, Kathy  
Boehm, Gerry  
Brescia, Chris  
Dougherty, Mark  
Favilla, Christy  
Genz, Greg  
Hayden, R.  
Knowles, Kim  
Novak, Ron  
O'Carroll, J  
Orstad, Carl  
Roark, Bev  
Salty, TRJ  
Schulte, Rose  
Smith, David  
Welge, Owen