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

16 April 2019

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 Supplemental Environmental Assessment (SEA) with unsigned Finding of No Significant Impact (FONSI) to evaluate the use of a proposed borrow site that would be used for the Bois Brule levee system in Perry County, Missouri. The SEA supplements an earlier EA that was prepared by the St. Louis District for the restoration and design deficiency corrections for the Bois Brule levee system, which was approved in 2003.

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 SEA and unsigned FONSI are available online at:
https://www.mvs.usace.army.mil/Portals/54/docs/pm/Reports/EA/BoisBruleBorrowAreaSEA.pdf

The St. Louis District of the U.S. Army Corps of Engineers is proposing to excavate of approximately 500,000 yd^3 material from the proposed borrow area. Environmental impacts associated with the proposed project are outlined in the draft SEA.

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. 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 20 May 2019.

Sincerely,

T C Allen

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

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

Hayden Borrow Area
Bois Brule Levee & Drainage District
Perry County, Missouri

April 2019

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

US Army Corps of Engineers ®
St. Louis District

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Bois Brule Levee & Drainage District
April 2019

1 INTRODUCTION

Bois Brule Levee and Drainage District is located in Perry County, Missouri, and Randolph County, Illinois, on the right descending bank of the Mississippi River between River Miles 94 and 111 above the Ohio River. The Bois Brule Levee and Drainage District (L&DD) encompasses approximately 26,505 acres of land used primarily for agriculture, and also includes a few small businesses, two major manufacturers, the Perryville Municipal Airport, residences, and the villages of McBride, Belgique, and Menfro. An Environmental Assessment (EA) was completed and Finding of No Significant Impact was signed in 2003. The EA evaluated design alternatives needed to correct design deficiencies and restore the Bois Brule levee system to the authorized level of protection.

The authorized project includes several measures to correct the design deficiencies, such as restoring the height of the back levee to the authorized height, additional relief wells, seepage berms, cutoff trench, and pump stations. In addition to these features, the 2003 Environmental Assessment describes the borrow requirements for the recommended project. A total of approximately 850,000 cubic yards of borrow is required to construct the recommended features.

This Supplemental Environmental Assessment (SEA) evaluates the direct, indirect, and cumulative environmental, cultural, and social effects of the proposed excavation at a newly proposed borrow site.

This SEA 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).

1.1 AUTHORITY

The Design Deficiency Correction Project falls within the original project authorization because it meets the criteria specified in Engineering Regulation 1165-2-119 regarding a design or construction deficiency. The Bois Brule flood control project was originally authorized and constructed under the authority of the Flood Control Act of 1936. In addition, the Energy and Water Development Appropriations Act of 2002 funded the deficiency correction project.

1.2 PROJECT LOCATION

The proposed borrow area lies in an upland area to the west of the Bois Brule levee system. The proposed borrow area is approximately 17 acres and is privately owned. This area is southwest of McBride, MO along Missouri Highway 51, and is approximately 0.20 miles from Bois Brule Creek (Figure 1).

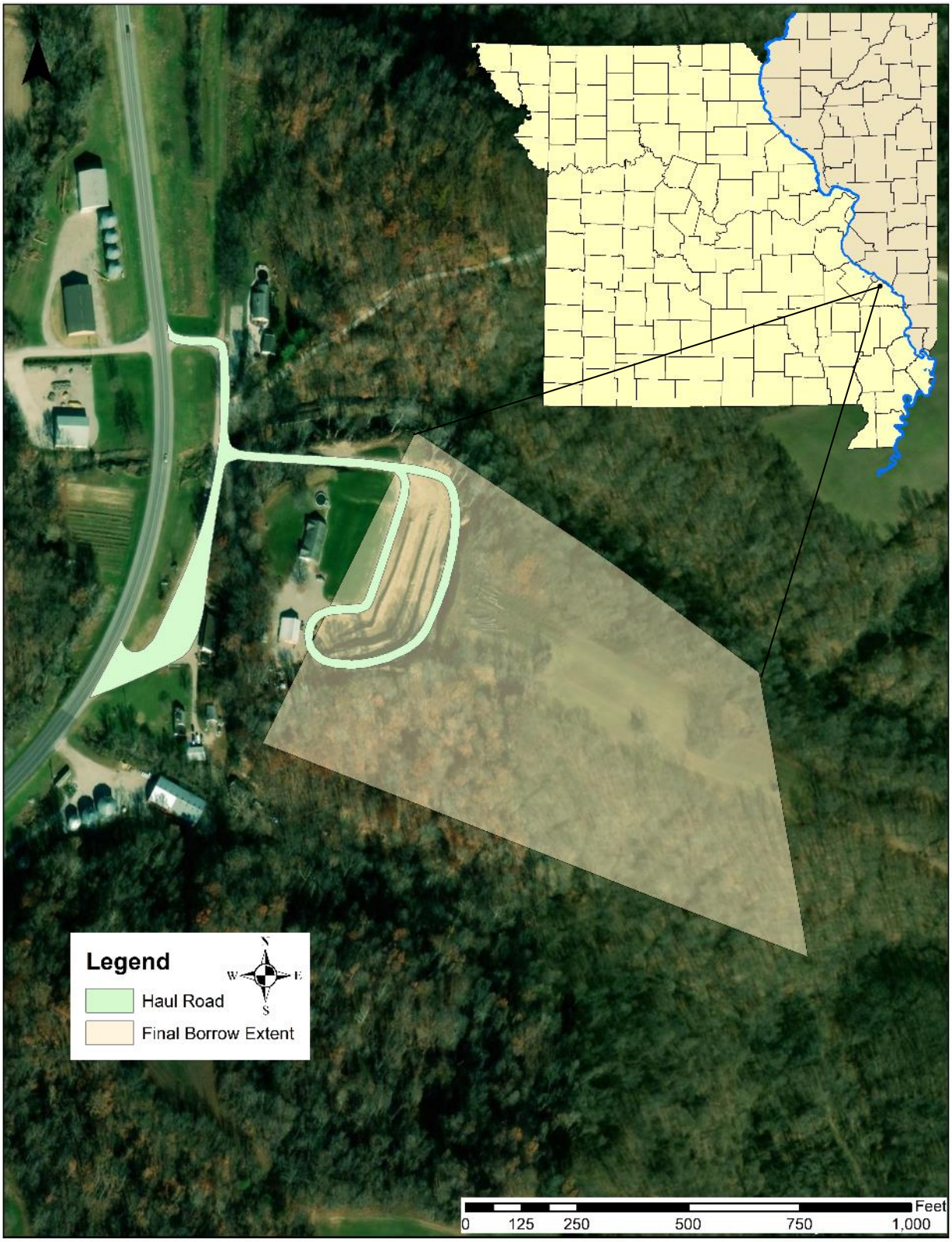

Figure 1. Location and outline of the proposed borrow area within Perry County, Missouri. Aerial photograph was taken on November 23, 2017 (ESRI 2019) and is representative of the existing site conditions.

1.3 PURPOSE AND NEED

The 2003 Design Deficiency Correction Project Report and Environmental Assessment describe several measures to correct the design deficiencies, such as restoring the height of the back levee to the authorized height, additional relief wells, seepage berms, cutoff trench, and pump stations. In addition to these features, the 2003 Environmental Assessment also describes the borrow requirements for the recommended project. A total of approximately 850,000 cubic yards of borrow would be required to construct the recommended features. Specific borrow areas were identified in 2003. However, some of the identified areas were commercial quarries. These quarries have been in full operation since 2003, resulting in insufficient quantities available to fulfill borrow requirements for the construction of the design deficiency corrections. In order to fulfill borrow requirements, the Hayden Borrow Area was identified as a potential borrow source during the final design of the project features. The Hayden Borrow Area has the potential to produce approximately 500,000+ cubic yards of borrow material, which in combination with the remaining borrow areas identified in 2003, would produce the quantity of borrow needed to construct the Design Deficiency Correction Project and reduce flood risk within the Bois Brule Drainage and Levee District.

2 ALTERNATIVES CONSIDERED

This section of the EA describes the alternatives considered and summarizes the alternatives in terms of their environmental impacts. An Action Alternative (Borrow Excavation Alternative) was developed by identifying measures and areas sufficient enough to meet borrow requirements. A No Action Alternative is also considered for the borrow area.

2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Hayden Borrow area would not be used as a borrow source for the Bois Brule Design Deficiency Correction Project. The 500,000 cubic yards (CY) of borrow that is proposed to be excavated from this property would not be completed and material from this site would not be used for construction of seepage berms or levee restoration. In order to complete the authorized project, additional borrow areas would need to be identified to fulfill the high borrow material requirements. However, during a site visit on 18 January 2019, the private landowner stated that if this proposed location was not used for the Bois Brule Design Deficiency Correction Project, he intended to continue to supply fill material for non-federally funded construction projects and harvest timber from the forested hillsides.

2.2 BORROW EXCAVATION ALTERNATIVE

2.2.1 Site Preparation

The proposed borrow location (Figure 1) has two distinct habitat types: forested and grassland/pasture. Site vegetation clearing would take place in a phased manner to reduce erosion risks and to reduce potential impacts to wildlife. These requirements and restrictions would be included in the borrow site Plans and Specifications. Specifically, the grassland/pasture area would be cleared first. Excavation of borrow material would take place within the grassland/pasture area throughout the year and would be stripped of non-woody vegetation as needed to access borrow material. The 4.9 acre forested area would

be cleared during the non-roost season (1 November through 30 March) for the Indiana bat, which also encompasses the non-roost season for northern long-eared bat. No other vegetation clearing (i.e., non-woody or woody vegetation) would occur within the forested area during the roost season (1 April through 31 October). The areas to be cleared in the two phases would be clearly demarcated and the footprint, and associated tree clearing restrictions, strictly maintained. Haul roads to and from the excavation area have been clearly defined along existing roadways and no new road construction would be needed (Figure 1). The access roads would be established along terraces throughout the excavation process and alignment of these roads would shift depending on the position of active excavation. However, any access road would be within the footprint of the borrow area and would not be a permanent structure.

2.2.2 Borrow Pit Excavation & Management

The site excavation plan for borrow material would be left to the discretion of the contractor while maintaining U.S. Army Corps of Engineers safety standards. However, it is anticipated that the contractor will maintain the terraced landscape until the quantity of material needed for the project has been excavated (~500,000 CY) or until they have excavated down to an elevation of 450 ft. The final contouring of the borrow pit and the proposed method of site rehabilitation would be decided upon by the private landowner and the contractor. Vegetation should be re-established on disturbed surfaces immediately after construction activities are completed. However, the private landowner plans to continue to use his property as a borrow source for private (i.e., non-Federally funded) construction projects, which may delay the rehabilitation of this site until all potential borrow material has been exhausted.

The contractor will submit and adhere to a Pollution Prevention Plan in order to reduce the impact of site erosion and sedimentation on adjacent lands and waterways through the use of Best Management Practices (BMPs). Potential erosion control methods could include water diversion, straw dikes, and vegetative cover. Potential sedimentation controls could include sediment ponds, silt fencing, and keeping areas lacking vegetation to a minimum. Any areas that have been cleared but not actively being excavated would be seeded to reduce erosion. A series of sediment control features are currently on the property to direct flow and allow any sediment in runoff to consolidate prior to the water being discharged into the neighboring intermittent stream.

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 SOILS

The landscape surrounding the proposed borrow area has a varying topography. The leveed area, which is bounded by the levee to the east and Bois Brule Creek to the west, is relatively flat with an elevation of less than 400 ft. However, to the west of Bois Brule Creek, the topographic relief of the area increases substantially. The proposed borrow area is in a higher elevation area and lies outside of the Mississippi River floodplain. Elevation ranges from 400 – 550 ft within the borrow area, with some adjacent areas reaching over 700 ft. Historic aerial photographs from this area indicate that the proposed borrow area has been a source of fill since as early as the 1960's (Figure 2) and as recently as 2017 (Figure 1).

Figure 2. Aerial photo of the proposed project area taken on January 26, 1968 (USGS 1968).

This area of Missouri is primarily karst and the bedrock is comprised of permeable carbonates and approximately 3,300 identified sinkholes. There are 702 known caves located in Perry County, some of which provide sensitive habitat for federally endangered species. Intense bedrock folding and faulting in the area create challenges for water supply, waste disposal, and construction. This area is also located within the New Madrid Seismic Zone and has a potential risk for earthquake-induced soil liquefaction along the Mississippi River floodplain. There are no known cave entrances or sinkholes within the borrow area boundary.

According to the U.S. Department of Agriculture's (USDA) Natural Resource Conservation Service (NRCS), the soil is primarily composed of the Menfro series. The Menfro series consists of very deep, well drained, moderately permeable soils formed in thick loess deposits on upland ridgetops adjacent to the Missouri and Mississippi River and their major tributaries. The soil profile for this area consists of silt loam and silt clay loam, which can be an ideal soil type for prime farmland on low slopes or deciduous

hardwood forests on sloped landscapes. Approximately four acres of the low sloped ridge top of the proposed borrow area is considered "farmland of statewide importance" (see Federal Agency

Figure 3. Existing terraced landscape that resulted from the 2017 borrow excavation. Best Management Practices were not fully implemented resulting in sparse vegetation and actively eroding soils on steep slopes. Picture was taken during a site visit on 18 January 2019.

Coordination Appendix). The remaining forested area is on a sloped terrain (30-50% slopes) and is not considered prime farmland. To evaluate the potential impacts to agricultural land and initiate compliance with the federal Farmland Preservation Act, the proposed actions were coordinated with the Missouri Office of Natural Resource Conservation Service (NRCS). The area considered prime farmland is not currently in agricultural production. In addition, the existing terraces at the proposed borrow site are sparsely vegetated resulting in actively eroding soils and unstable terrain (Figure 3).

3.2 HYDROLOGY AND HYDRAULICS

The proposed borrow area is within the Upper Mississippi-Cape Girardeau Watershed (HUC8: 10290106), which covers portions of Ste. Genevieve, Perry, Cape Girardeau, and Scott Counties in Missouri, and portions of Randolph, Jackson, Union, and Alexander Counties in Illinois. Within Missouri, there are approximately 1,390 miles of major streams within the watershed. Some of the larger streams include Apple, Indian, Saline, South Fork Saline, Bois Brule Creeks, River aux Vases, and the Mississippi River. The proposed borrow area is within the Bois Brule Creek sub-watershed (Figure 4; HUC12: 0714010504), which is within the Cinque Hommes Watershed (HUC10). There are no perennial or intermittent streams within the proposed borrow area. Since the proposed borrow area is located on a

ridge top, surface runoff from this area flows down the hillside into a series of intermittent streams before entering into Bois Brule Creek above the confluence with Cinque Hommes Creek.

Approximately 25 percent of the streams in the watershed are classified as losing due to the unique geology of the region. Losing streams are bodies of water that lose significant amounts of water as it flows downstream. The water from the streams infiltrate into the ground recharging the local groundwater, because the water table is below the bottom of the stream bed. These losing streams can recharge two major groundwater aquifers in the region, the St. Francois and the Ozark. In addition to losing streams, there are 64 stream resurgences, or springs, in the watershed. The Blue Spring Branch Conservation area, which is approximately four miles from the proposed borrow area, contains the Ball Mill Resurgence Natural Area. The resurgence is fed by many sinkholes in the area, and typically flows after heavy rains. Within the proposed borrow area, there are no known stream resurgences or sinkholes.

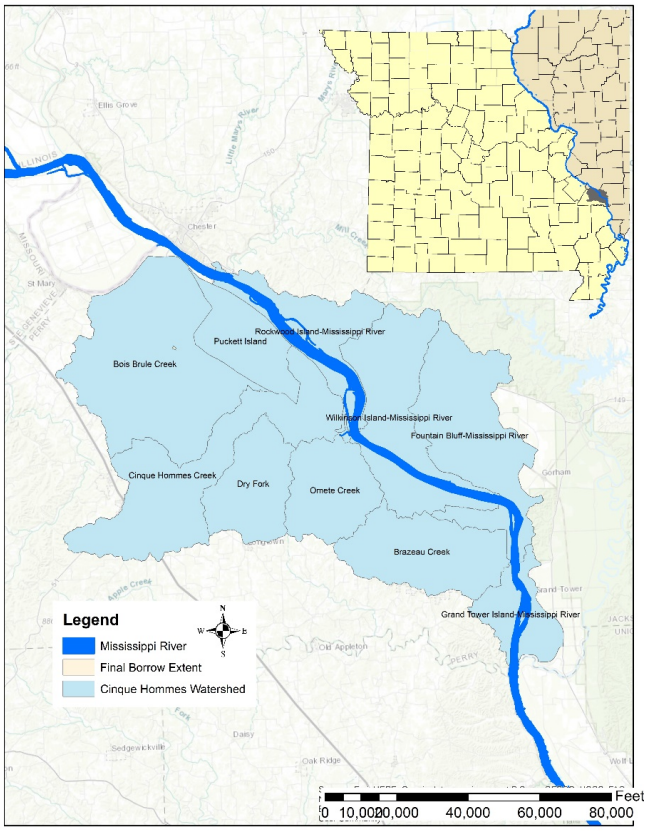

Figure 4. The proposed borrow area is within the Bois Brule Creek sub-watershed. Any surface runoff would flow through a series of intermittent streams prior to entering Bois Brule Creek.

3.3 WATER QUALITY

Water quality standards protect beneficial uses of water such as whole body contact (i.e., swimming), maintaining fish and other aquatic life, and providing drinking water for people, livestock, and wildlife. Section 303(d) of the Clean Water Act of 1972, as amended, requires each state to identify waters that do not meet water quality standards and for which adequate water pollution controls are not in place. Waters that are identified that do not meet water quality standards are considered impaired. There are two lakes and six streams within the Upper Mississippi-Cape Girardeau Watershed that are listed on Missouri's 2018 list of impaired waterways (Table 1; MDNR 2018). The porous nature of karst geology allows for the direct input of large amounts of sediment and anthropogenic contaminants into the underlying cave systems and then to surface waters. Agricultural runoff has increased levels of *Escherichia coli* contamination in several surface streams within the Cinque Hommes watershed, resulting in their impaired waters listing.

Table 1. List of impaired water bodies and their cause of impairment according to Missouri's list of impaired waterways (2018).

Name	Type	Cause of Impairment
Brazeau Creek	Perennial River	Escherichia coli (E. coli)
Cinque Hommes Creek	Perennial River	Escherichia coli (E. coli)
Dry Fork	Intermittent River	Escherichia coli (E. coli)
Headwater Diversion Channel	Perennial River	Mercury in Fish Tissue
Mcclanahan Creek	Intermittent River	Escherichia coli (E. coli)
Omete Creek	Intermittent River	Escherichia coli (E. coli)
Lake Boutin	Reservoir	Mercury in Fish Tissue
Perry County Community Lake	Reservoir	Mercury in Fish Tissue

3.4 RECREATION AND AESTHETICS

There are 702 known caves located in Perry County, some of which provide sensitive habitat for federally endangered species. Crevice Cave and Berome Moore Cave are two of the longest caves in Perry County and are near the project area. Due to the high density of caves in Perry County, cavers from around the United States are drawn to this region. Caving is the recreational pastime of exploring non-commercial cave systems. However, due to the spread of White-nose Syndrome, most caves on public land in Missouri are closed to the public without special permission. There are several caves within Missouri that are owned, or managed, by the Middle Mississippi Valley Grotto and the Missouri Caves and Karst Conservancy. Cave entrances located on private lands cannot be accessed by the general public unless permission is given by the land owner.

There are six conservation and natural areas managed by the Missouri Department of Conservation (MDC) within Perry County. These conservation and natural areas provide recreational and aesthetically pleasing natural areas for public use. All of the areas have hiking trails while some of the areas have boat access, campgrounds, shooting ranges, and/or picnic areas. The Blue Spring Branch Conservation Area (CA) is the closest MDC managed CA to the proposed borrow area (Figure 5). The CA straddles portions

Figure 5. The Blue Spring Branch Conservation Area is owned and managed by the Missouri Department of Conservation. This CA is the closest public recreation area to the proposed borrow location, which is indicated by the blue circle.

of the Blue Spring Branch upstream of the village of Lithium and lies approximately four miles from the proposed borrow area. The Blue Spring Branch Conservation Area provides opportunities for bird watching, hunting, fishing, trapping, and hiking. Missouri Department of Conservation also manages the Missouri Outdoor Recreational Access Program (MRAP) which are privately owned properties that the landowner has allowed walk-in public access. In Perry County, there is one MRAP area in Perryville, MO, that is open for public fishing.

The area surrounding the proposed borrow area is undeveloped with some densely wooded areas. Many of the ridge tops have been cleared of trees and are utilized for row crop or pasture for grazing. In general, this area could be considered aesthetically pleasing due to the naturalness of the area. The proposed borrow area is directly adjacent to Missouri Highway 51. However, due to the topography of the region, the property cannot be seen from Missouri Highway 51 and is unlikely to provide any aesthetic value to the public.

3.5 VEGETATION AND WETLANDS

According to the National Land Cover Database (NLCD; Homer et al., 2015) the upland areas surrounding the proposed borrow area are predominately deciduous forest and with some areas of grasslands, but cultivated crops and pasture lands dominate the lowland areas. The land within the borrow boundary is primarily made up of deciduous forests and grasslands (Table 2). Based on recent aerial imagery, the proposed borrow area is deciduous forest and grasslands; however, there is also a 2.4 acre area that has previously been excavated (Figure 1 and Figure 6). Currently, the old pasture area is scattered with small groups of trees. The small groups of trees primarily contain box elder and sugar maple. The deciduous forest area is primarily dominated by near mature oak species and sugar maples. The understory is primarily composed of sugar maple, ash, and elm species. The haul roads leading to the property are maintained county and state roadways, and no additional vegetation removal would be needed to use these roadways. The access roads within the borrow area would follow the crushed stone driveway and then along terraces throughout the excavation area.

The proposed borrow area was evaluated by the USACE Regulatory Branch. It was determined that there are no Section 404 of the Clean Water Act concerns with borrow material coming from this proposed location. In addition, the soils in this area are mapped as well drained menfro silt loam and there do not appear to be any potential waters of the U.S. on site.

Table 2. Existing land-use of the proposed borrow area primarily consists of deciduous forest, residential lawn, grassland/pasture, and excavated areas. Acres of each of these land uses were estimated based on aerial imagery.

Land Use	Acres
Residential Lawn	0.35
Existing Borrow Area	2.40
Grassland	2.91
Deciduous Forest	11.30
Total	16.96

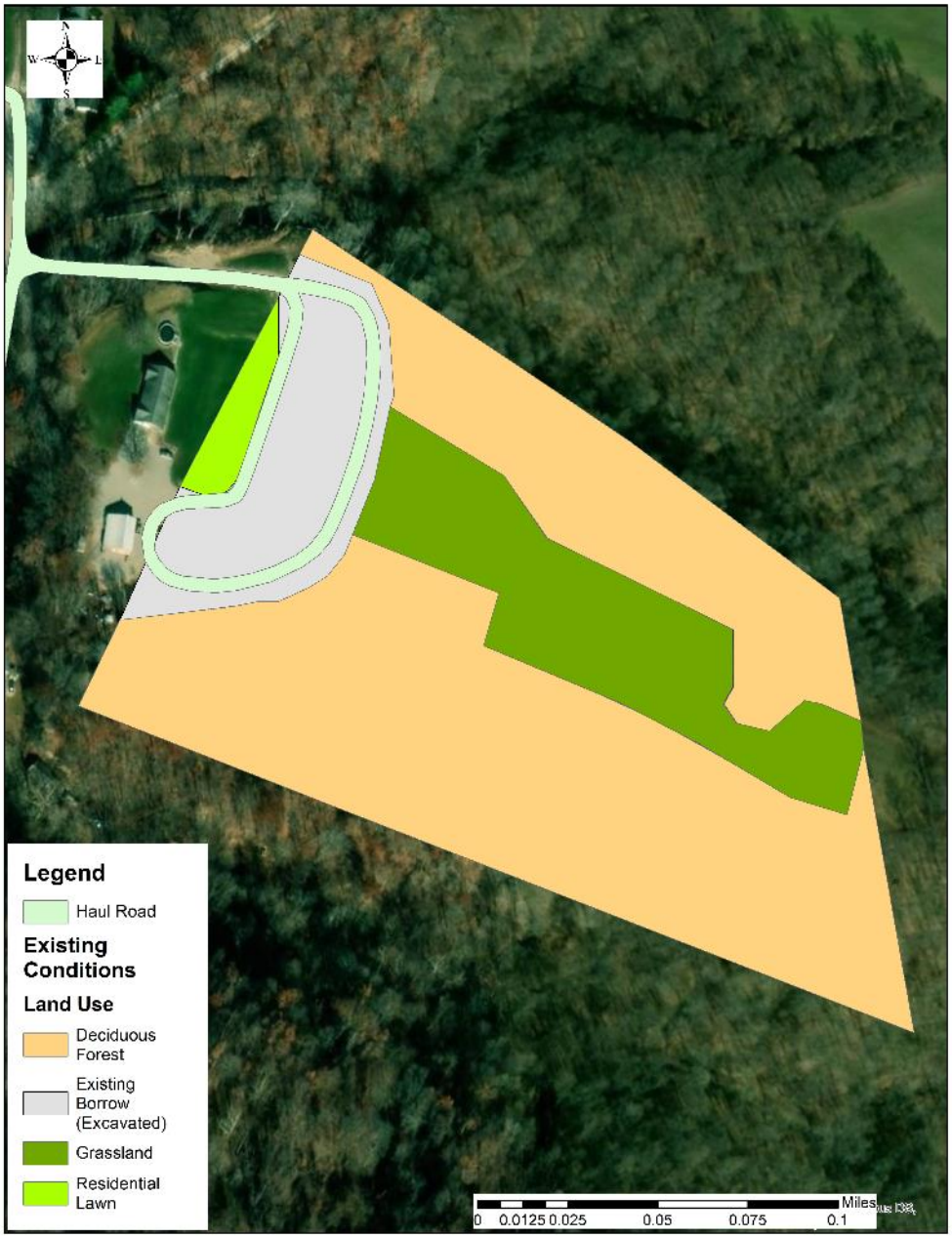

Figure 6. Vegetation conditions at the proposed borrow area based on aerial imagery from November 2017.

3.6 FISH AND WILDLIFE

The Mississippi River and interior streams provide habitat for fish species in this region. The portion of the Mississippi River adjacent to the Bois Brule Levee and Drainage District is home to several native species of fish such as minnow species, gizzard shad, shovelnose sturgeon, pallid sturgeon, and buffalo species. This area is also home to several species of non-native fishes such as the common carp, silver carp, bighead carp, and grass carp. The grotto sculpin, a federally-listed endangered species, is currently

found in two karst areas in Perry County, Missouri which include: Blue Spring Branch including the Moore Cave System, and the Cinque Hommes Creek Drainage, including underlying caves.

Habitat for wildlife in this region consists of cropland, pasture, forests, and wetlands. Within the Bois Brule Levee and Drainage district, cropland is the primary habitat available to wildlife. Wetland habitats are found on the riverside of the levee system and would provide habitat for a number of wading birds, waterfowl, amphibians, and fish. The croplands provide important food sources for area wildlife, such as common bobwhite quail, field sparrow, cottontail rabbit, red fox, and white-tailed deer. The upland forests consist of deciduous and coniferous forests mixed with pasture lands. The forested areas provide habitat for wild turkey, American woodcock, woodpeckers, squirrels, raccoon, bats, and white-tailed deer. Isolated sightings of feral hogs have occurred in Perry County.

Chronic Wasting Disease is a deadly illness in white-tailed deer and other members of the Cervid Family. CWD kills all deer it infects and has been found in Missouri. Perry County is in the Chronic Wasting Disease Management Zone. In 2018, Missouri Department of Conservation performed mandatory CWD sampling during the opening weekend of the gun-season with voluntary CWD sampling occurring all season.

A bat habitat assessment was conducted on 18 January, 2019 by Ben McGuire, wildlife biologist, and Alison Anderson, fisheries biologist. The purpose of bat habitat assessment (Phase I Habitat Assessment Appendix) was to identify potential Indiana bat habitat within the 17 acre area identified for potential borrow. Even though the habitat assessment was specifically for the Indiana bat, other woodland bat species, such as the little brown bat, could also use trees with crevices, cracks, hollow limbs, or sloughing bark for roosting. The proposed borrow location has two distinct habitat types: forested and grassland/pasture. Currently, the old pasture area is scattered with small groups of trees. The small groups

Figure 7. Within the grassland/old pasture area of the proposed borrow area, two potential Indiana bat roost trees were identified, and marked with pink flagging tape, by USACE biologists on 18 January 2019.

of trees primarily contained box elder and sugar maple, but did contain two trees (Figure 7) that fit the criteria as potential roost trees for Indiana bats. Although these did fit the criteria, more suitable roosts with exfoliating bark, larger cavities, hollow broken branches, high sun exposure, etc., do exist within the adjacent forested areas. The deciduous forest area was primarily dominated by near mature oak species and sugar maples. The understory was primarily composed of sugar maple, ash, and elm species. Suitable roosts were identified within the forested area at a density of approximately three per acre. The old pasture and forest habitats within the proposed borrow area would also provide suitable habitat for a number of species of mammals and birds.

3.7 THREATENED AND ENDANGERED SPECIES

3.7.1 State Listed Species

The Missouri Department of Conservation Natural Heritage Review Website was accessed on 3 January 2019 (Project Number 5233). The Level One Report (see State Agency Coordination Appendix) indicated that there are no known records of sensitive fish, wildlife, plants, natural communities, or habitats within the proposed project area.

3.7.2 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 08 April 2019, for a list of Federal threatened, endangered and candidate species (see Federal Agency Coordination Appendix) that could potentially be located in the project areas (Consultation Code: 03E14000-2019-SLI-0507 and Event Code: 03E14000-2019-E-02875).

Table 3. List of federally listed threatened and endangered species potentially occurring within the proposed project area.

Common Name	Scientific Name	Listing Status	Habitat
Indiana Bat	*Myotis sodalis*	Endangered	Caves and mines (hibernacula); small stream corridors with well-developed riparian woods, upland forests (foraging)
Northern Long-eared Bat	*Myotis septentrionalis*	Threatened	Caves and mines (hibernacula); small stream corridors with well-developed riparian woods, upland forests (foraging)
Gray Bat	*Myotis grisescens*	Endangered	Roost in caves or mines year-round and use water features and forested riparian corridors for foraging and travel
Grotto Sculpin	*Cottus caverna*	Endangered	Karst cave streams in Perry County, Missouri

Indiana Bat. This species hibernates in caves or mines only during the winter. In Missouri the hibernation season is considered to be 1 November to 31 March. During the active season in Missouri (1 April to 31

October) they roost in forest and woodland habitats. Suitable summer habitat for Indiana 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) or greater, 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 Bat. This species hibernates in caves or mines only during the winter. In Missouri the hibernation season is considered to be 1 November to 31 March. During the active season in Missouri (1 April to 31 October) they roost in forest and woodland habitats. Suitable summer habitat for 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 3 inches dbh or greater 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.

Gray Bat. Gray bats roost in caves or mines year-round and use water features, such as streams, rivers, lakes, and reservoirs, and forested riparian corridors for foraging and travel.

Grotto Sculpin. The grotto sculpin is a small fish that dwells in cave streams. Typical of most cave-dwelling creatures, this fish has greatly reduced or absent eyes and skin pigmentation. The grotto sculpin is currently found in two karst areas in Perry County, Missouri which include: Blue Spring Branch including the Moore Cave System, and the Cinque Hommes Creek Drainage, including underlying caves. Within these cave systems, grotto sculpin occur in cave streams and associated resurgences and springs. The Perry County Community Economic and Environmental Committee has drafted a Conservation Plan aimed at protecting these karst systems.

3.8 BALD AND GOLDEN EAGLES & MIGRATORY BIRDS

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 U.S. Fish and Wildlife Service 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. The proposed borrow area is within the geographic range of nesting bald eagles in Missouri. There are two bald eagle nests located within two miles of the proposed borrow area along Bois Brule Creek.

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 encourages implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally 1 March to 31 August) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

3.9 CULTURAL AND TRIBAL 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.

In addition to the consultation with MO State Historic Preservation Office (SHPO), consultation with Native American Tribal organizations is also 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.

An intensive Phase 1 Archaeological Survey of the proposed borrow area was conducted on February 25-26, 2019 by the Center of Archaeological Research at Missouri State University. Following MO SHPO guidelines and standards, the ridge summit was shovel tested at 15-x-15-m intervals and a visual survey of disturbed areas was conducted at areas exhibiting 25-35% visibility. One prehistoric site (23PY1723), consisting of a light scatter of chert artifacts and fire-cracked rock, was located. Based on the results of the survey, the site is recommended as not eligible for the National Register of Historic Places (NRHP). Approximately one third of the site has been destroyed by previous borrow excavations and the existing portion is restricted to disturbed plow-zone deposits. No artifacts were found in undisturbed contexts and no diagnostic artifacts were recovered at all. It is likely that the destroyed section of the site contained the highest density of cultural material. Given the lack of site integrity there is little in the way of future research potential. Survey results were sent to MO SHPO and the Tribal organizations (see Cultural and Tribal Coordination Appendix for an example letter and tables of Tribal representatives).

3.10 SOCIOECONOMICS AND TRANSPORTATION

Perry County, Missouri, has an estimated total population of 19,135. Approximately 61% of the population is employed with most being employed in manufacturing or education and healthcare. Median household income for the County is $54,935.

The Bois Brule L&DD reduces flood risk to approximately 26,347 acres of predominately agricultural land. There are a few small businesses, major manufacturers, a municipal airport, and several residences within the villages of McBride, Belgique, and Menfro that are within in the leveed area.

The proposed borrow area lies outside of the Bois Brule L&DD in an upland site and is directly adjacent to Missouri Highway 51. Missouri Highway 51 is a major transportation corridor for individuals travelling between Perryville, Missouri, and Chester, Illinois. The highway also connects to U.S. Interstate 55 in Perryville, Missouri.

3.11 HAZARDOUS, TOXIC, AND RADIOACTIVE MATERIALS

U.S. Army Corps of Engineers (USACE) regulations (ER 1165-2-132 and ER 200-2-3) and District policy require procedures be established to facilitate early identification and appropriate consideration of potential hazardous, toxic, or radioactive waste (HTRW) in reconnaissance, feasibility, preconstruction engineering and design, land acquisition, construction, operations and maintenance, repairs, replacement, and rehabilitation phases of water resources studies or projects by conducting Environmental Condition of Property (ECP) Assessments. The Corps specifies that these assessments follow the process/standard practices for conducting Phase I Environmental Site Assessments (ESA) published by the American Society for Testing and Materials (ASTM).

A Phase I site assessment was conducted by USACE personnel for the project 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 – Transaction Screen Process (interview questionnaires)

The purpose of the Phase I ESA was to identify, to the extent feasible in the absence of sampling and analysis, the range of contaminants (i.e. Recognized Environmental Conditions[1] or RECs) within the scope of the U.S. Environmental Protection Agency's (USEPA) Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and petroleum products.

A Phase I Environmental Site Assessment was completed for the Bois Brule Hayden Borrow Area on 17 January 2019 (USACE, 2019). The scope of the Phase I consisted of the following four components: 1) records review; 2) site reconnaissance; 3) interviews; and 4) report. The assessment revealed no RECs in connection with this property. There are no records indicating any spills, pesticide/herbicide use, or HTRW contamination. Therefore, no Phase II assessment is necessary for the proposed project area.

3.12 Air Quality and Noise

The Clean Air Act of 1963 requires the U.S. Environmental Protection Agency (EPA) to designate National Ambient Air Quality Standards (NAAQS). The EPA has identified standards for 6 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 4). This region of Perry County, MO, is currently in attainment for all EPA air quality standards (USEPA, 2018).

Table 4. Six pollutants and their standard criteria designated by the U.S. EPA.

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

Noises within and adjacent to the proposed borrow site can consist of vehicle traffic and maintenance equipment (e.g., lawn mowers, chainsaws). Due to a variety of activities in and around the proposed borrow area, noise levels can range widely. For example, a typical car can produce 60 – 90 decibels (dB) at a distance of 50 feet, while noise from lawnmowers and chainsaws range from 90 – 100 dB (Figure 8; USEPA, 1974).

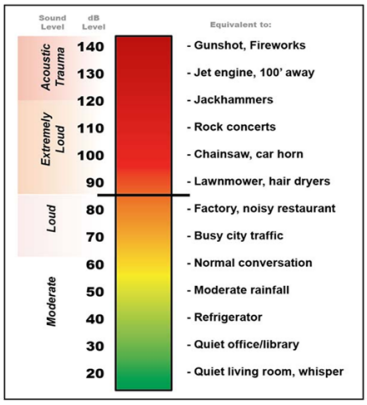

Figure 8. Sound and decibel (dB) levels of a variety of sources that may occur at or near the proposed project area.

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 proposed action. 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 SOILS

4.1.1 No Action Alternative

The landowner would continue to supply fill material for non-federally funded construction projects until suitable fill material was exhausted or until the landowner's desired site conditions were achieved. Any new excavation would likely follow the existing terraced landscape.

The top of the bedrock is estimated to occur below an elevation of 450 ft. Therefore, any excavation by the current landowner is not expected to impact the geology or soil profile of the site. The continued excavation of this site may reduce the slope of the hillsides, potentially increasing the amount of suitable farmland within the property boundary. USACE personnel cannot guarantee that erosion control methods would be implemented under the No Action Alternative. It is anticipated the BMPs would not be fully implemented and current site conditions would be representative of any future site conditions (i.e., steep terraces and minimal erosion control).

4.1.2 Borrow Excavation Alternative

The topology of the site would be altered under the Borrow Excavation Alternative. It is anticipated that excavation would approximately follow the existing terraced landscape. The terrace would recede toward the back of the property until 500,000 CY of material was excavated, or until an elevation of 450 ft was reached across the entire site.

The top of the bedrock is estimated to occur below an elevation of 450 ft. Therefore, excavation under this alternative is not expected to impact the geology or soil profile of the site. The continued excavation of this site may reduce the slope of the hillsides, potentially increasing the amount of suitable farmland within the property boundary. BMPs would be implemented to reduce the impact of site erosion and sedimentation on adjacent lands and waterways, and soil transport would be limited to on-site movement.

4.2 HYDROLOGY AND HYDRAULICS

4.2.1 No Action Alternative

The landowner would continue to alter the topology of the site, which could impact surface runoff. USACE personnel cannot guarantee that BMPs to control overland flow and minimize erosion would be implemented. Without proper BMPs to restrict surface runoff, the hydrology of the receiving waterways could be altered during rain events. An increase in surface runoff, would cause a greater increase in stream velocity and sediment transport when compared to a natural setting or excavation with BMPs in place.

4.2.2 Borrow Excavation Alternative

The alterations of the elevation across the proposed borrow area could impact surface runoff and intermittent streams adjacent to the proposed borrow area. BMPs that control overland flow would be implemented which would also minimize the direct and indirect effects of erosion and sedimentation within the proposed borrow area, and receiving waters adjacent to the borrow area. The terraced landscape, in combination with BMPs, would control surface runoff during rain events so impacts to the hydrology of receiving streams outside of the proposed borrow area would not be impacted.

4.3 WATER QUALITY

4.3.1 No Action Alternative

The landowner would continue to alter the topology of the site, which could impact surface runoff. USACE personnel cannot guarantee that BMPs to control overland flow and minimize erosion would be implemented. Without proper BMPs to restrict surface runoff, the water quality of the receiving waterways could be impacted during rain events. An increase in surface runoff would cause a greater increase in stream velocity and sediment transport when compared to a natural setting or excavation with BMPs in place. Increases in total suspended solids in receiving streams could lead to an impairment listing on the Missouri Department of Natural Resources Section 303(d) list due to sedimentation/siltation.

4.3.2 Borrow Excavation Alternative

Alterations of the elevation across the proposed borrow area could impact surface runoff and intermittent streams adjacent to the proposed borrow area. BMPs that control overland flow would be implemented to minimize the direct and indirect effects of erosion and sedimentation within and adjacent to the proposed project area. Through the implementation of land disturbance BMPs, the proposed action would have little effect on the water chemistry of the receiving intermittent stream. BMPs such as avoidance of the proposed borrow area during periods of extended wet/saturated soil conditions, locating landings in flat terrain, and construction and maintenance of sediment ponds and erosion control silt fencing around the borrow area during and post excavation. Soil runoff resulting from the proposed action would be limited to on-site movement. The proposed borrow area was evaluated for potential hazardous, toxic, and radioactive waste (HTRW) contamination (USACE 2019). USACE personnel have determined that the excavation of material from this site poses a low risk in uncovering hazardous materials.

4.4 RECREATION AND AESTHETICS

4.4.1 No Action Alternative

Under the No Action Alternative, the private landowner would continue to use the property for personal recreation (i.e., hunting) and would be able to create a desired property condition by continuing to sell fill material for non-federally funded projects. Recreation opportunities would continue to only be available to the private landowner and their designated users. Since the proposed borrow area cannot be seen from Missouri Highway 51, the continued excavation of the property would not detract from the aesthetics of the area.

4.4.2 Borrow Excavation Alternative

Recreation opportunities and the aesthetics of the area are expected to be similar to the No Action Alternative.

4.5 VEGETATION AND WETLANDS

4.5.1 No Action Alternative

Under the No Action Alternative, the private landowner intends to conduct a timber harvest in the mature deciduous forest and continue to supply fill material for other non-federally funded construction projects.

Over time, the land use composition of the site would be altered from a predominately forested habitat to a grassland habitat. Improper implementation of BMPs could result in unstable landscape conditions due to persistent erosion that may result in further site degradation and loss of vegetation.

4.5.2 Borrow Excavation Alternative

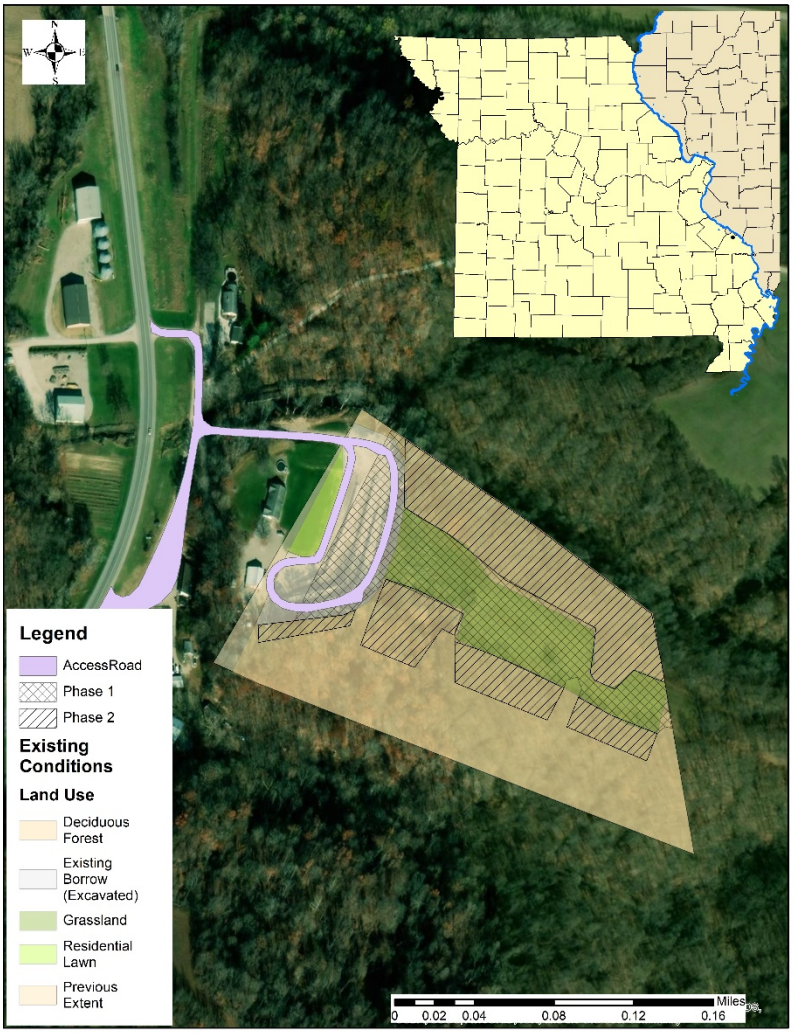

Figure 8. Vegetation clearing would occur in two phases in order to avoid impacts to bat species as well as to reduce on-site erosion.

The land use composition of the borrow area would change through the clearing of a total of 4.9 acres of mature deciduous forest during Phase 2 of site preparation (Figure 9). In addition, approximately 3 acres of open pasture would be cleared during Phase 1 of site preparation. The landowner would likely continue to clear woody-vegetation until they have exhausted their borrow stockpile. Once completed, the landowner may rehabilitate the borrow area by re-establishing grasslands or forested habitats. BMPs, which include establishing vegetative cover, would be implemented to reduce on-site erosion and subsequent indirect impacts on the surrounding landscape.

4.6 FISH AND WILDLIFE

4.6.1 No Action Alternative

Over time, the clearing of deciduous forest to supply fill material and for timber harvest would alter the habitat for woodland bird species (e.g., woodpecker species, warbler species, black-capped chickadee, white-breasted nuthatch, etc.) and small mammals (e.g., bats, rabbits, squirrels, and raccoons). In addition, any increase in erosion on-site and sediment transport into waterways outside of the borrow area may negatively impact stream fishes and benthic macroinvertebrates. The presence and use of excavation equipment and haul truck traffic may deter wildlife from entering the proposed borrow area. However, any construction noise related impacts would only occur during active construction.

4.6.2 Borrow Excavation Alternative

Structural changes resulting from the site clearing would have the greatest effect on forest biotic relationships. The proposed action may permanently convert 4.9 of the 11.2 acres of forest, which contains potential roost habitat for woodland bat species, into non-forest habitat within the White Nose Syndrome (WNS) region. The removal of forested habitat would also eliminate suitable habitat for woodland bird species (e.g., woodpecker species, warbler species, black-capped chickadee, white-breasted nuthatch, etc.) and small mammals (e.g., bats, rabbits, squirrels, and raccoons). Tree clearing activities would be restricted to non-summer months, which would avoid adverse impacts to nesting birds. In addition, the presence and use of excavation equipment and consistent haul truck traffic may deter wildlife from entering the proposed borrow area. However, any construction noise related impacts would only occur during active construction and would cease once the borrow requirement was met.

4.7 THREATENED AND ENDANGERED SPECIES

4.7.1 State Listed Species

4.7.1.1 No Action Alternative

The Level One Report (see State Agency Coordination Appendix) indicated that there are no known records of sensitive fish, wildlife, plants, natural communities, or habitats within the proposed project area. Any potential impacts to state listed threatened and endangered species are not anticipated.

4.7.1.2 Borrow Excavation Alternative

The Level One Report indicated that there are no known records of sensitive fish, wildlife, plants, natural communities, or habitats within the proposed project area. Any potential impacts to state listed threatened and endangered species are not anticipated.

4.7.2 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. USACE, St. Louis District, has prepared a Biological Assessment (BA) to address the implementation of the proposed project. The draft BA was provided to the U.S. Fish and Wildlife Service (see Federal Agency Coordination Appendix) on 28 February 2019. A follow-up coordination call was held on 25 March 2019 to discuss reducing the forest clearing footprint to below 5 acres in order to avoid adverse impacts to bat species; as well as the

appropriate BMPs to implement to avoid impacts to grotto sculpin. A summary of the determinations made in the Biological Assessment are presented below.

4.7.2.1 No Action Alternative

Under the No Action Alternative, the private landowner intends to conduct a timber harvest in the mature deciduous forest and continue to supply fill material for other non-federally funded construction projects. Over time, the land use composition of the site would be altered from a predominately forested habitat to a grassland habitat. The forested habitat contains potential roost habitat for woodland bat species. Under the No Action Alternative, tree clearing restriction dates and implementation of BMPs are not guaranteed, which may result in direct adverse impacts to threatened and endangered bat species, and indirect impacts to grotto sculpin.

4.7.2.2 Borrow Excavation Alternative

Indiana Bat. All tree clearing activity associated with the proposed borrow excavation would take place while the Indiana bat is in hibernation (1 November – 31 March). In order to avoid impacts to bat species, the proposed tree clearing for the project was reduced from 11.6 acres to 4.9 acres. Therefore, the St. Louis District has determined that the proposed action *"may affect, but is not likely to adversely affect"* the Indiana Bat.

Northern Long-eared Bat. All tree clearing activity associated with the proposed borrow excavation would take place while the Northern long-eared bat is in hibernation (1 November – 31 March). In order to avoid impacts to bat species, the proposed tree clearing for the project was reduced from 11.6 acres to 4.9 acres. Therefore, the St. Louis District has determined that the proposed action *"may affect, but is not likely to adversely affect"* the Northern long-eared bat.

Gray Bat. All tree clearing activity associated with the proposed borrow excavation would take place while the Gray bat is in hibernation (1 November – 31 March). In addition, the proposed borrow area is not adjacent to any known cave entrances. In order to avoid impacts to bat species, the proposed tree clearing for the project was reduced from 11.6 acres to 4.9 acres. Therefore, the St. Louis District has determined that the proposed action *"may affect, but is not likely to adversely affect"* the Gray bat.

Grotto Sculpin. No aquatic habitat would be impacted during the proposed borrow excavation. Erosion control BMPs would be implemented to reduce indirect effects resulting from potential increased sedimentation. In addition, the proposed borrow area would not directly drain into known grotto sculpin habitat. Therefore, the St. Louis District has determined that the proposed action *"may affect, but is not likely to adversely affect"* the grotto sculpin.

4.8 BALD AND GOLDEN EAGLES AND MIGRATORY BIRDS

4.8.1 No Action Alternative

Under the No Action Alternative, the levee restoration near County Road 212 and Bois Brule Pump Station would still occur between 1 September and 31 December. There are two known bald eagle nests located in this area. Haul trucks from the quarry and other approved borrow areas would be travelling near the bald eagle nests during that time. However, no employees or equipment would be permitted to stage or stop with the 660' buffer around the eagle nests outside of these dates. Since the eagle nests are

along an existing roadway and within an intensely farmed area, the increased truck traffic is not expected to disturb nesting bald eagles. Therefore, no impacts to bald eagles or their nests are anticipated.

4.8.2 Borrow Excavation Alternative

No bald eagle nests are known to occur within the proposed borrow area boundaries. Therefore, impacts associated with the Borrow Excavation Alternative would be similar to the No Action Alternative. Haul trucks from the proposed borrow area would travel the same path as in the No Action Alternative to access construction sites along the interior Bois Brule Levee. The clearing of forested habitat would occur outside the nesting season (generally 1 March to 31 August) for most bird species. Therefore, no adverse impacts to migratory birds are anticipated.

4.9 Cultural and Tribal Resources

4.9.1 No Action Alternative

The proposed borrow area contains an archaeological site (23PY1723). It, however, lacks integrity and is recommended not eligible for the NRHP.

4.9.2 Borrow Excavation Alternative

The proposed borrow area contains an archaeological site (23PY1723). It, however, lacks integrity and is recommended not eligible for the NRHP. Based on historic background research and the findings of the surveys, it is recommended that the proposed project should have no adverse effect on historic properties. The St. Louis District sent a letter to the Missouri State Historic Preservation Office (SHPO), as well as representatives from 26 federally recognized tribes, requesting concurrence with the determination that no significant properties would be adversely affected by the proposed project (see Cultural and Tribal Coordination Appendix). If during borrow excavation previously unrecorded buried cultural resources are encountered, the earth-moving activities would cease in the immediate area and MO SHPO and USACE archaeologists would be consulted.

4.10 Socioeconomics and Transportation

4.10.1 No Action Alternative

Under the No Action Alternative, transportation in and around the proposed project area is anticipated to remain the same.

4.10.2 Borrow Excavation Alternative

The proposed borrow area is a residential property. Due to the highly forested area surrounding the residence, it cannot be seen from Highway 51. The property is situated on a ridge and the excavated portions would not be visible from the road either. The transport of borrow material from the proposed borrow area has the potential to impact the local traffic patterns. Missouri Highway 51 is a well-travelled highway that connects Perryville, MO, to Chester, IL. The average dump truck can transport 10 – 14 CY of dirt. The proposed borrow site could produce approximately 500,000 CY of fill, which could take between 50,000 and 35,715 dump truck visits to haul that quantity of borrow material away from the site. However, the Perryville Quarry is approximately 1 mile south of the proposed borrow area on Highway 51, so the presence of haul trucks and large machinery is not uncommon for this region. In order to alleviate potential traffic congestion in this area, a haul truck waiting area has been designated in an

existing gravel parking lot directly adjacent to the borrow area entrance. In addition, the contractor would be required to submit a traffic control plan that meets Federal Manual on Uniform Traffic Control Devices (MUTCD) guidelines (FHWA 2012). The MUTCD defines the standards used by road managers nationwide to install and maintain traffic control devices on all public streets, bikeways, and private roads open to public travel.

4.11 HAZARDOUS, TOXIC, AND RADIOACTIVE MATERIALS

4.11.1 No Action Alternative

If the proposed borrow area was not used as a borrow source for the Bois Brule Levee Design Deficiency project, then alternate borrow areas would have to be identified. If the materials were to come from a commercial stone quarry, the quarry must be able to produce borrow material which meets USACE specifications and be free of organic and inorganic contaminants, in order to avoid adverse impacts to human health and the environment. If an alternate private borrow source was identified, the USACE St. Louis District would evaluate the area for HTRW prior to any excavation.

4.11.2 Borrow Excavation Alternative

Since there are no current HTRW concerns within the proposed project area, no environmental impacts associated with hazardous, toxic, or radioactive wastes are anticipated. However, if any suspect materials were discovered at any point during borrow excavation, the USACE St. Louis District would be contacted immediately.

4.12 AIR QUALITY AND NOISE

4.12.1 No Action Alternative

If the proposed borrow area was not used as a borrow source for the Bois Brule Levee Design Deficiency project, then alternate borrow areas would have to be identified. These alternate borrow areas could be further away from the Bois Brule Drainage and Levee District. In addition, the private land owner would continue to supply fill for near-by non-federal construction projects from the proposed borrow area. By taking No Action at the proposed borrow area, a larger amount of emissions could be generated when compared to the Borrow Excavation Alternative.

4.12.2 Borrow Excavation Alternative

During construction, there may be a temporary and localized reduction in air quality due to emissions from heavy machinery operating. However, once the proposed project is complete, no effects to air quality would occur. Since Perry County, MO, is currently in attainment for all criteria pollutants, *de minimis* rates (e.g., ozone at 100 tons/year and carbon monoxide at 100 tons/year) are not applicable and a General Conformity analysis was not conducted (40 CFR §93.102).

Diesel emissions from project construction may pose a human health risk for construction workers and exposure to emissions should be minimized. The contractor may consult the *Construction Emission Control Checklist* to reduce expose to diesel exhaust or the *Cleaner Diesels: Low Cost Ways to Reduce Emissions from Construction Equipment* report (USEPA 2007) to reduce the generation of emissions. Special management techniques would be implemented to control air pollution produced by the construction activities would be specified in the construction specifications. Airborne particulates,

including dust particles, from construction activities and processing and preparation of materials would be required to be controlled at all times, including weekend, holidays, and hours when work is not in progress. The contractor would be required to maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, disposal sites, and other work areas free from airborne dust. In addition, hydrocarbon and carbon monoxide emissions from equipment would be required to be controlled to Federal and State allowable limits at all times. Therefore, effects of construction on air quality would be insignificant.

Implementation of the proposed project may cause a temporary increase in noise in the project vicinity. Site preparation, which involves tree clearing, would have an increase in noise levels due to the use of chainsaws. Excavation would require heavy equipment to operate in the area, such as excavators and haul trucks, and these machines would generate noise during construction. This effect would only occur during the construction period, and so is anticipated to be temporary. Effects of the increased noise would be comparable to an increase in truck traffic from the near-by Perryville Quarry and therefore is not anticipated to impact the quality of life in the surrounding area. Once the proposed project is complete, no increased effects due to noise would occur.

5 ENVIRONMENTAL JUSTICE

Executive Order 12898 directs federal agencies to take the appropriate steps to identify and address any disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on minority and low-income populations. Minority populations are those persons who identify themselves as Black, Hispanic, Asian American, American Indian/Alaskan Native, and Pacific Islander. A minority population exists where the percentage of minorities in an affected area either exceeds 50 percent or is meaningfully greater than in the general population.

Perry County, Missouri, has a population of approximately 18,971 with 8.2% of individuals below the poverty line (U.S. Census, 2010) and approximately 2.7% of individuals identifying as a non-white race (U.S. Census, 2010). The nearest populated area to the proposed project area is Perryville, Missouri, which has a population of approximately 8,225 individuals with 11% of individuals below the poverty line and approximately 4.7% identifying as a non-white race (U.S. Census, 2010). Therefore, the proposed action would not disproportionately affect minority or low-income populations nor have any adverse human health impacts. No interaction with other projects would result in any such disproportionate impacts. No cumulative impacts to Environmental Justice would be expected from interaction of the proposed action with other past, present, and reasonably foreseeable projects. Tribal governments that are also environmental justice communities in the project area have been engaged.

6 CLIMATE CHANGE

The USACE, Institute for 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. Furthermore, any contribution to climate change as a result of the proposed project would be negligible and undetectable.

7 CUMULATIVE AND ADVERSE IMPACTS

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 5). The cumulative effects analysis for the Hayden Borrow project followed these 11 steps (Table 5). The following subsections are organized by the three main components – scoping, describing the affected environment, and determining the environmental consequences.

Table 5. CEQ's 11-step approach for assessing cumulative effects.

Component	Steps
Scoping	1. Identify resources
	2. Define the study area for each resource
	3. Define time frame for analysis
	4. Identify other actions affecting the resources
Describing the Affected Environment	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
Determining the Environmental Consequences	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. The geographic boundary for the cumulative effects action area for threatened and endangered species, and other fish and wildlife, as well as vegetation and wetlands, was defined as all lands and waters within five miles of the proposed borrow site boundary (Figure 10). 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

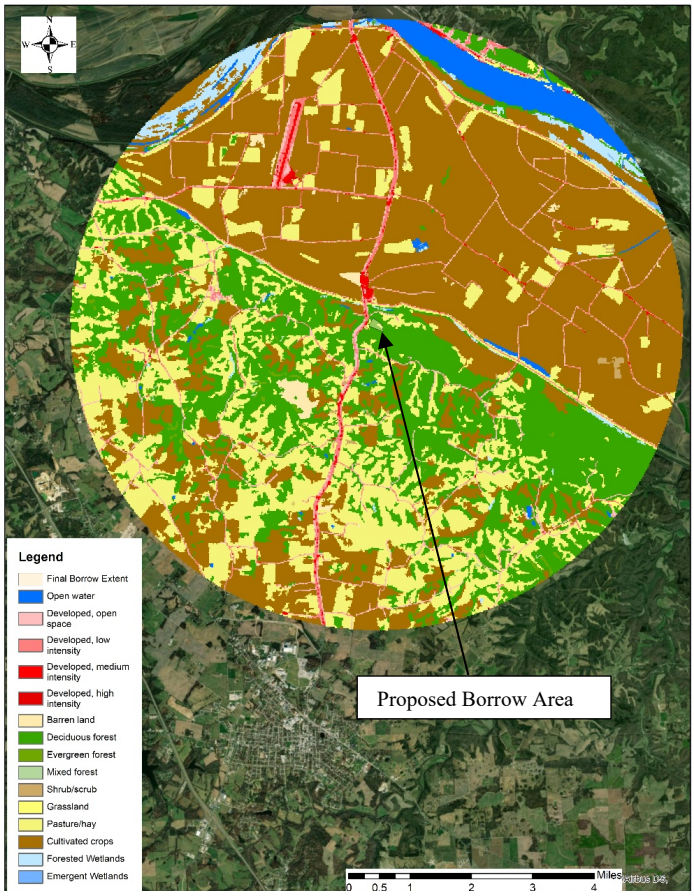

Figure 10. The Cumulative Effects boundary, which was determined by a 5-mile radius from the center of the proposed borrow area, contains mostly agricultural crops lands, pasture, and forest (Homer et al. 2011).

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. This 5-mile boundary also incorporates the Bois Brule Creek sub-watershed, which is the homerange of the grotto sculpin, and a small portion of the Mississippi River. For water quality and HTRW, the Cinque Hommes watershed (HUC8) serves as a natural geographic boundary. The remaining resources were analyzed at the county level.

Table 6. Geographic boundaries for the cumulative effects analysis for resources outlined in this Environmental Assessment.

Resource	Geographic Boundary
Vegetation & Wetlands	5-mile radius
Topology, Geology, and Soils	Perry County
Wildlife & Fisheries	5-mile radius
Threatened & Endangered Species	5-mile radius
Water Quality	Cinque Hommes Watershed
HTRW	Cinque Hommes Watershed
Historic & Cultural Resources	Perry County
Socioeconomics & Transportation	Perry County
Recreation & Aesthetics	Perry County
Air Quality & Noise Levels	Perry County

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 1968 when the construction of the Bois Brule Levee & Drainage District levee system was originally completed, and ends in 2030 (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:

- **Crains Island UMRR-HREP:** Crains Island is managed by the USFWS as part of the Middle Mississippi River National Wildlife Refuge. USACE, in cooperation with the USFWS, is designing an Upper Mississippi River Restoration Habitat Rehabilitation and Enhancement Project (HREP) at Crains Island. The goal of the project is to restore and improve the quality and diversity of aquatic side channel, floodplain forest, and wetland ecosystem resources within Crains Island. A portion of the Crains Island HREP falls within the 5-mile radius of the proposed borrow site. Construction for the Crains Island HREP is anticipated to start in 2020 and would enhance potential bat habitat in this region.
- **Perry County Community Conservation Plan:** The community of Perry County has assembled a community plan that integrates environmental stewardship practices into community development plans when feasible. They have identified several main objectives and are working within the community to meet these objectives. These objectives include: 1) sinkhole clean-up; 2) minimize movement of surface chemicals to groundwater; 3) application of vertical drain practice and sinkhole stabilization protection; 4) improved vertical drain installation; 5) proper installation and function of septic tank or sewage lagoon; 6) improve runoff control along roadways; 7) improved management of wastewater and stormwater outflows; 8) improve animal waste management; 9) proper disposal of animal carcasses; and 10) minimize erosion and sediment transport to aquatic systems. These objectives would be met by developing educational programs for the public, working with local and regional partners to help implement programs, and prioritize action areas to address.

Past actions have degraded wetland resources within the UMR watershed through floodplain disconnection, floodplain constriction, clearing of forested areas, agricultural practices, increased water input to the system, altered hydrology due to dam construction upstream, and spread of invasive species. Resource managers have projected the continued decline, and have identified a need for improved management of floodplain habitats within the UMR (Theiling *et al.* 2000). The cumulative effects boundary for the borrow area encompasses a portion of the Bois Brule Levee and Drainage District (L&DD). The Bois Brule L&DD includes approximately 26,505 acres of land used primarily for agriculture, and also includes a few small businesses, two major manufacturers, the Perryville Municipal Airport, residences, and the villages of McBride, Belgique, and Menfro. The levee is currently being restored to its authorized level of flood risk reduction. In order to reach the authorized level, the levee will be restored to its authorized height and other features (i.e., seepage berms, relief wells, and pump stations) are scheduled to be constructed within the next 5 years.

Within the cumulative effects analysis area, major land cover types include approximately 1,400 acres of open water; 11,000 acres of forest; 11,000 acres of pasture/hay lands; 740 acres of forested wetlands; 33 acres of emergent wetlands and 23,000 acres of cultivated agricultural crop lands (Homer et al. 2011). The proposed action would result in the removal of approximately 4.9 acres of forest, which is approximately 0.045% of the total available forested habitat within the cumulative effects analysis area. For the foreseeable future, it is expected that agriculture remains as one of the main land use practices in this region. Urban growth and development is slow in this rural area. Typically, the only development occurs when old structures are occasionally torn down and replaced with new residences or outbuildings.

The misuse of sinkholes, and the subsequent water quality impacts, in Perry County remains one of the greatest threats to fish populations, including the federally endangered grotto sculpin population (Day et al. 2014). It is estimated that over half of the sinkholes in Perry County contain large quantities of unregulated household and agricultural refuse, enhancing the threat of pollution to cave systems (Burr et al. 2001). Groundwater contamination led to the localized extirpation of the grotto sculpin in 2001 and 2005. Even though the population has increased to the present day, anthropogenic pollution and periods of low dissolved oxygen are still capable of extirpating large portions of the grotto sculpin population. In order to help protect cave ecosystems and their native species, the Perry County Community Economic and Environmental Committee has drafted a Conservation Plan aimed at protecting these karst systems and provides BMPs for private properties that contain sinkholes. Adult grotto sculpin also utilize surface streams, like Bois Brule Creek. Surface runoff from agricultural and industrial landscapes can cause rapid shifts in the water quality, directly impacting grotto sculpin and impacting their ability to move and survive within the watershed. Since water quality and hydrology have been substantially altered as a result of historic actions, it is expected to remain unchanged from existing conditions over the next 10 years.

In March 2010, the fungus (*Pseudogymnoascus destructans*) that causes WNS was detected on hibernating bats in Missouri for the first time. In May 2010, five gray bats were netted just outside an Ozark National Scenic Riverways cave in Shannon County and tested positive for the fungus and exhibited scarring on their wings that indicated they had probably been infected over the winter. The disease was confirmed on hibernating bats in Missouri in early 2012. A substantial number of counties in Missouri are now suspected or confirmed to have WNS. The first confirmation of bat mortality from WNS in Missouri was announced by the Missouri Department of Conservation in 2014. There have been steady decreases in bat numbers in several caves in Missouri. During the winter of 2015/2016, 166 (29.1%) of the 571 sites surveyed had signs of WNS (visible fungal growth or detection of *Pseudogymnoascus destructans* via swab samples). Visible WNS fungal growth has been documented at over 240 hibernacula since 2012, and at least one cave in 45 (39%) of Missouri's counties had documented signs of WNS as of 2016.

Tree removal in this area could negatively affect potential gray bat foraging habitat as well as Indiana and northern long-eared bat roosting and foraging habitat. However, suitable roosting and foraging habitat is not limiting in the cumulative effects analysis area, as indicated by the acres of deciduous forest in the region. However, no other threat is as severe and immediate as that posed by white-nose syndrome. If this disease had not emerged, it is unlikely the Indiana or northern long-eared populations would be declining so dramatically. Recent efforts have been made in Perry County to protect bats species and prevent the spread of White Nose Syndrome in Missouri caves. The Missouri Caves and Karst Conservancy, in cooperation with private landowners and state agencies, actively conserve cave and karst areas in Missouri through the purchase and management of caves, as well as educate local communities and fellow cavers across the U.S. about cave and karst conservation and promote scientific study of cave environments. Promoting cave conservation helps protect threatened and endangered species, as well as preserve recreational opportunities for the future and benefits the local economies.

7.3 SUMMARY CUMULATIVE EFFECTS BY RESOURCE

The remainder of this chapter describes the summary of the cumulative effects analysis for each of the resources outlined in this Environmental Assessment (Chapters 3 & 4). The potential cumulative effects

of excavating borrow material from the Hayden Borrow site on each resource was identified (Table 7). If the project was not identified to have an incremental cumulative effect on a resource, then this resource was not discussed in detail within this section. The cumulative effects analysis discusses future conditions as follows:

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

Although the proposed project may have considerable impacts on environmental resources within the project boundary, the impacts of the proposed project would be considered to be minor under the cumulative action area analysis. The proposed project would have no adverse impacts that could be considered additive to existing and future actions in this area.

Table 7. Checklist for identifying potential cumulative effects of excavating material at the proposed Hayden Borrow Area.

Resource	Without Project	With Project	Past Actions	Other Present Actions	Other Future Actions	Project's Incremental Cumulative Impact
Vegetation & Wetlands	M	M	H	◆	◆	◆
Topology, Geology & Soils	H	H	S	◆	◆	◆
Fish & Wildlife	S	S^1	H	+	+	◆
Threatened & Endangered Species	S	◆	H	+	◆	◆
Water Quality	S	◆	M	M	+	◆
HTRW	◆	◆	S	◆	◆	◆
Historic & Cultural Resources	◆	◆	S	◆	◆	◆
Socioeconomics & Transportation	◆	◆	+	+	◆	◆
Recreation & Aesthetics	◆	◆	+	+	+	◆
Air Quality & Noise Levels	S^1	S^1	◆	◆	◆	◆

KEY: ◆ = no change S = slight adverse effect S^1 = temporary, slight adverse effect
M = moderate adverse effect H = high adverse effect + = beneficial effect

8 COORDINATION

Notification of the Draft Environmental Assessment and unsigned Finding of No Significant Impact was sent to officials, agencies, organizations, and individuals listed below for public review and comment. Additionally, an electronic copy was available during the public review period (16 April – 20 May 2019) on the USACE St. Louis District's website at:

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

Please note that the Finding of No Significant Impact was unsigned in the draft version of the EA and would 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.

MVS External Agency Stakeholder

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Environmental Protection Agency, Region 7
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Teah, Phillip
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Welge, Owen

9 ENVIRONMENTAL COMPLIANCE

Guidance	Degree of Compliance
Federal Statutes	
Archaeological and Historic Preservation Act, as Amended, 16 U.S.C. 469, et seq.	PC[1]
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	FC
Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601-9675	FC
Endangered Species Act, as Amended, 16 U.S.C. 1531-1543	PC[2]
Farmland Protection Policy Act, 7 U.S.C. 4201-4208	PC[2]
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[2]
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[3]
National Historic Preservation Act, as Amended, 54 U.S.C 300101, et seq.	PC[1]
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
Executive Orders	
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[1]
Consultation and Coordination with Indian Tribal Governments, 06 Nov 2000, E.O. 13175	PC[1]
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.

10 LIST OF PREPARERS

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- Mark Smith, Ph.D., Cultural and Tribal Coordinator
- Chad Lamontange, Regulatory
- Dennis Gilmore, Project Manger
- Doug Reilly, Civil Engineer

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UNSIGNED FINDING OF NO SIGNIFICANT IMPACT

Hayden Borrow Area
Bois Brule Levee & Drainage District
Perry County, Missouri

1. In accordance with the National Environmental Policy Act, I have reviewed and evaluated the documents relevant to the excavation of 500,000 cubic yards of borrow material from the Hayden Borrow site for the Bois Brule Levee Design Deficiency Corrections Project. The work involves the excavation of approximately 500,000 cubic yards of material, as well as the clearing of approximately 4.9 acres of deciduous forest and approximately 3 acres of old field/pasture.

2. As part of this evaluation, I have considered the following project alternatives:

    a. Excavation Alternative (Proposed Action) - USACE would excavate borrow material from the Hayden Borrow site and use the material to construct project features associated with the Bois Brule Levee Design Deficiency Corrections Project. The work involves the excavation of approximately 500,000 cubic yards of material, as well as the clearing of approximately 4.9 acres of deciduous forest and approximately 3 acres of old field/pasture. No tree clearing can occur from 1 April through 31 October. Ground disturbance Best Management Practices will be implemented to control on site erosion and sedimentation in receiving waterways, as well as air quality during construction. In addition, traffic notification measures will be deployed to reduce any potential impacts associated with hauling borrow material from this location.

    b. No Action Alternative- Under this alternative, no federal action would take place and the site would not be used for borrow material for the Bois Brule Levee project. However, the private landowner intends to perform a timber harvest and to continue to supply fill material for non-federally funded projects.

3. The possible consequences of the two 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, recreation, and wetland resources would not be impacted as a result of the project.
    b. The topology, hydrology, and vegetation of the site would be altered from the existing conditions. Implementation of Best Management Practices would minimize the impacts of those alterations on the human environment.
    c. No adverse impacts to federally threatened or endangered species, or their critical habitats, are anticipated.
    d. No adverse impacts upon archaeological remains or historic properties are anticipated.

e. No significant impacts to natural resources, including fish and wildlife, are anticipated. 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.
f. The "No Action" alternative was evaluated and would be unacceptable to recommend as it does not meet the project purpose.

4. Compliance with Section 106 of the National Historic Preservation Act (NHPA) was achieved through coordination with the Illinois State Historic Preservation Office and Tribal Historic Preservation Offices. The Fish and Wildlife Service reviewed the Biological Assessment and Environmental Assessment 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 Proposed Action 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

STATE AGENCY COORDINATION APPENDIX

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 One Report: No Known Records

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: Hayden Borrow Area-Bois Brule Levee Project #5233
Project Description: The proposed project is within Perry County. The outlined area would be used as a borrow source for the Bois Brule Levee Design Deficiency Correction project. The property would be cleared of trees and fill material excavated to a depth of approximately 40 ft. The material would be trucked to construction areas near the Bois Brule Levee.
Project Type: Mining, Other
Contact Person: Alison Anderson
Contact Information: Alison.M.Anderson@usace.army.mil or 314-331-8458

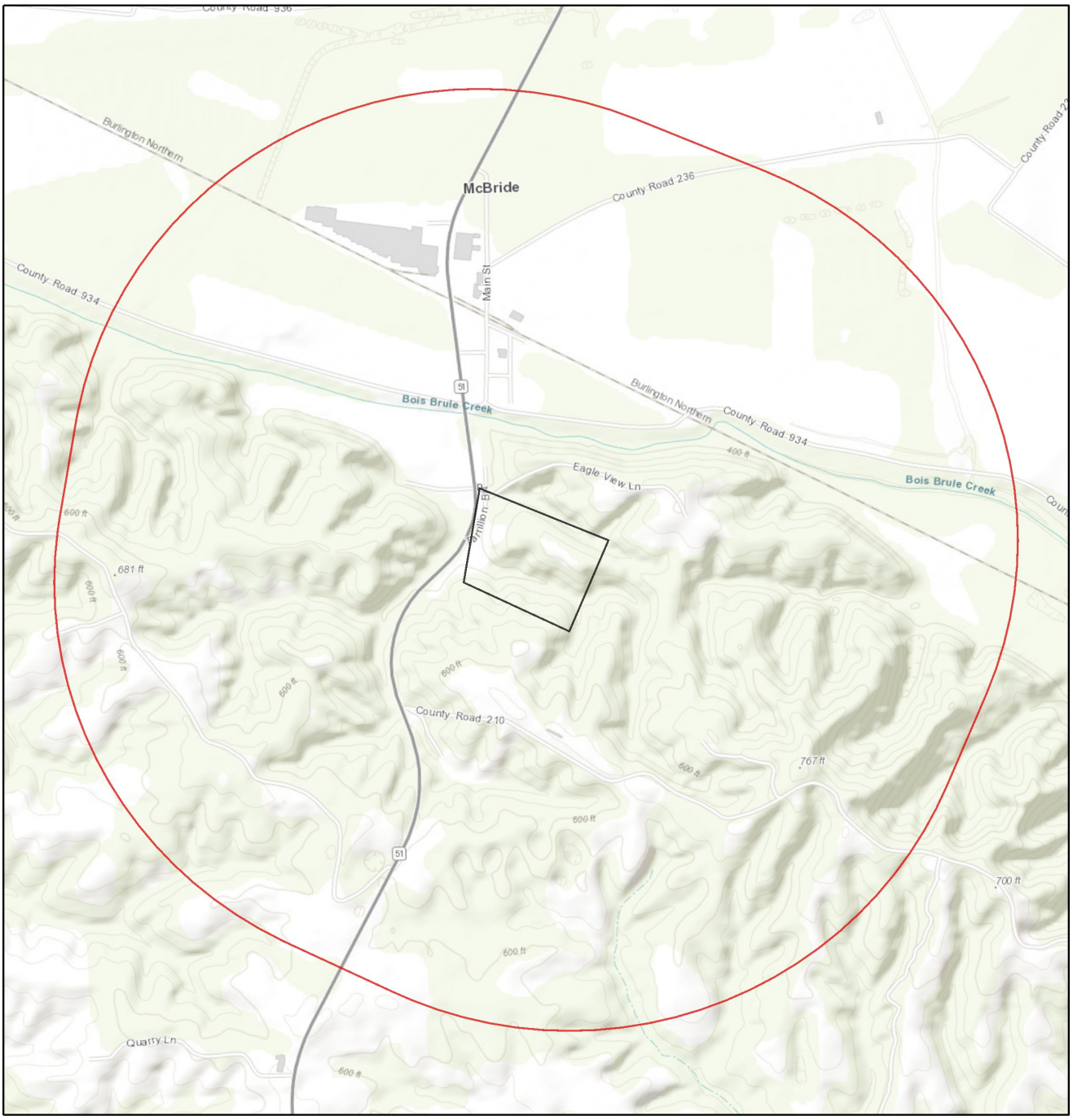
Disclaimer: The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive 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 for additional information on recommendations.

Hayden Borrow Area-Bois Brule Levee Project



January 3, 2019

1:21,983

0 0.175 0.35 0.7 mi

0 0.3 0.6 1.2 km

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), swisstopo, © OpenStreetMap contributors, and the GIS User Community

Species or Communities of Conservation Concern within the Area:

There are no known records for Species or Natural Communities of Conservation Concern within the defined Project Area.

Other Special Search Results:

No results have been identified for this project location.

Project Type Recommendations:
Mining: Other should be managed to minimize erosion and sedimentation/runoff to nearby streams and lakes, including adherence to any “Clean Water Permit” conditions. Project design should include stormwater management elements that assure storm discharge rates to streams for heavy rain events will not increase from present levels. Revegetate disturbed areas to minimize erosion using native plant species compatible with the local landscape and wildlife needs. Annual ryegrass may be combined with native perennials for quicker green-up. Avoid aggressive exotic perennials such as crownvetch and sericea lespedeza. Best management recommendations relating to streams and rivers may be found at: https://mdc.mo.gov/property/pond-stream-care/streams-construction-best-practices.

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

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 1 0-4.111. 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 . If you would like printed copies of best management practices cited as internet URLs, please contact the Missouri Department of Conservation.

FEDERAL AGENCY COORDINATION APPENDIX

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: April 08, 2019
Consultation Code: 03E14000-2019-SLI-0507
Event Code: 03E14000-2019-E-02875
Project Name: Bois Brule Hayden Borrow Area Supplemental Environmental Assessment

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. N**ote 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-0507

Event Code: 03E14000-2019-E-02875

Project Name: Bois Brule Hayden Borrow Area Supplemental Environmental Assessment

Project Type: DREDGE / EXCAVATION

Project Description: As part of the Design Deficiency Correction project for the Bois Brule Levee, USACE and the Levee District are proposing to use the defined area to obtain borrow material for seepage berms and levee restoration. In order to get to the borrow material, approximately 10 acres of trees would be removed and the underlying soil would be excavated to roughly 50 ft deep. Approximately 500,000 cubic yards of soil would be removed from this location. An Environmental Assessment was completed in 2003 for the Design Deficiency Correction project, but it did not include this borrow area. This area is now being evaluated as part of a Supplemental Environmental Assessment.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.82468168617245N89.83764857712971W

Counties: Perry, MO

Endangered Species Act Species

There is a total of 4 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[1], 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.

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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 *Myotis grisescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened

Fishes

NAME	STATUS
Grotto Sculpin *Cottus specus* There is **final** critical habitat for this species. However, no *actual* acres or miles were designated due to exemptions and/or exclusions. See Federal Register publication for details. Species profile: https://ecos.fws.gov/ecp/species/1009	Endangered

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

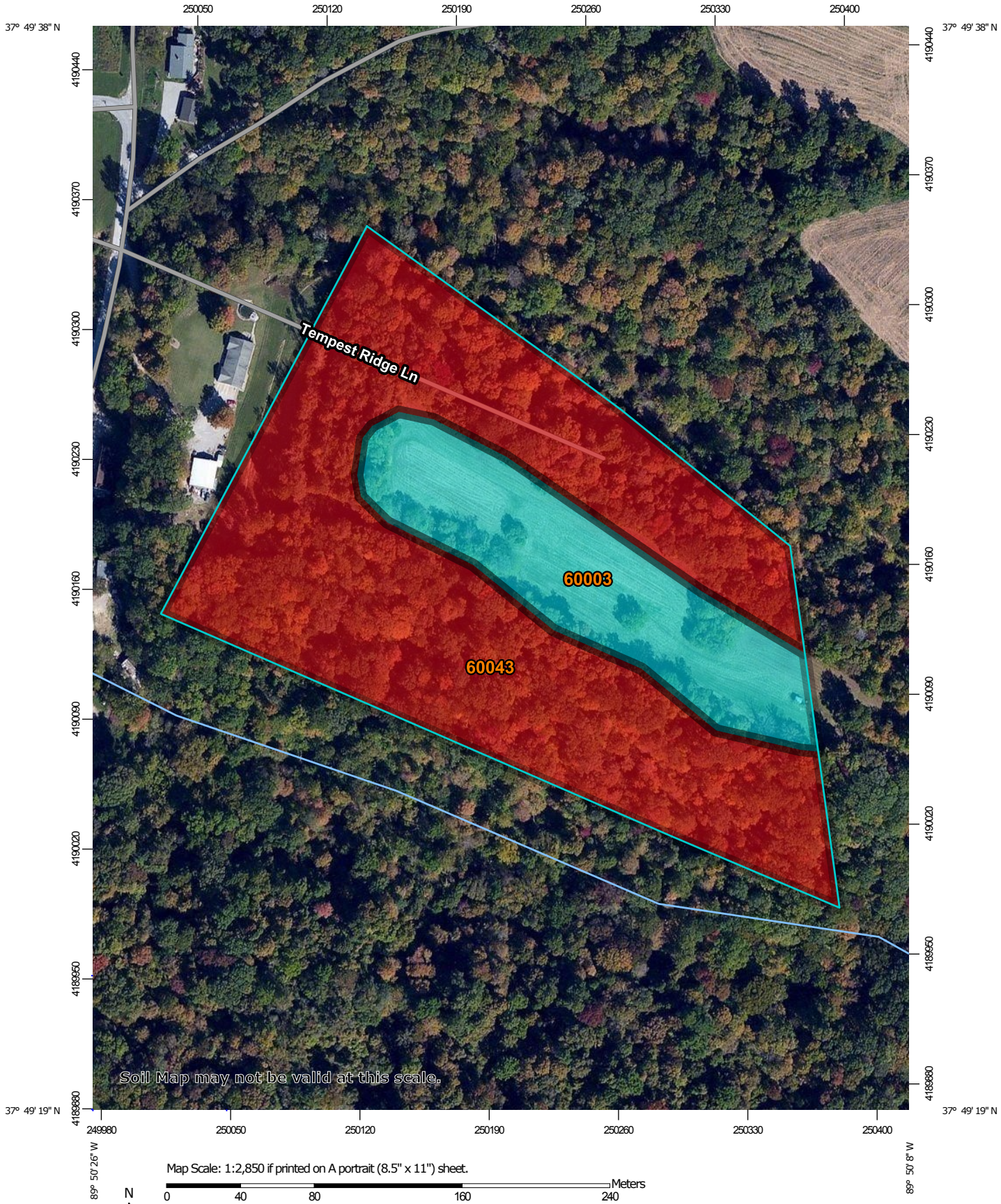
Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

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.

THERE ARE NO WETLANDS WITHIN YOUR PROJECT AREA.

Farmland Classification—Perry County, Missouri
(Borrow_Final)



Map Scale: 1:2,850 if printed on A portrait (8.5" x 11") sheet.

N

Meters
0 40 80 160 240

Feet
0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Lines

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Soil Rating Points

- Not prime farmland
- All areas are prime farmland
- Prime farmland if drained
- Prime farmland if protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated
- Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if irrigated and drained
- Prime farmland if irrigated and either protected from flooding or not frequently flooded during the growing season
- Prime farmland if subsoiled, completely removing the root inhibiting soil layer
- Prime farmland if irrigated and the product of I (soil erodibility) x C (climate factor) does not exceed 60
- Prime farmland if irrigated and reclaimed of excess salts and sodium
- Farmland of statewide importance
- Farmland of local importance
- Farmland of unique importance
- Not rated or not available

Water Features

MAP INFORMATION

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Perry County, Missouri
Survey Area Data: Version 19, Sep 14, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Sep 13, 2011—Oct 7, 2011

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Farmland Classification

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
60003	Menfro silt loam, 9 to 14 percent slopes, eroded	Farmland of statewide importance	4.0	23.6%
60043	Menfro silt loam, 30 to 50 percent slopes	Not prime farmland	12.9	76.4%
Totals for Area of Interest			**16.8**	**100.0%**

Description

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland. It identifies the location and extent of the soils that are best suited to food, feed, fiber, forage, and oilseed crops. NRCS policy and procedures on prime and unique farmlands are published in the "Federal Register," Vol. 43, No. 21, January 31, 1978.

Rating Options

Aggregation Method: No Aggregation Necessary

Tie-break Rule: Lower

CULTURAL & TRIBAL COORDINATION APPENDIX

MISSOURI DEPARTMENT OF NATURAL RESOURCES
HISTORIC PRESERVATION PROGRAM
PO. BOX 176, JEFFERSON CITY, MISSOURI 65102
(573) 751-7858

SECTION 106 SURVEY MEMO

SHPO USE ONLY	
REVIEWER	
DATE	SHPO LOG #
☐ ACCEPTED	☐ REJECTED

1) HPP 106 PROJECT #

LOCATION INFORMATION AND SURVEY CONDITIONS

2) COUNTY(S)
Perry

3) QUADRANGLE
Belgique 7.5'

4) PROJECT TYPE/TITLE
An Intensive Phase I Survey of a Proposed 16-acre Borrow Area for Bois Brule Levee Grade Restoration Project, Perry County, Missouri

5) FUNDING/PERMITTING FEDERAL AGENCY(S)
U.S. Army Corps of Engineers, St. Louis District

6) SECTION
Land Grant Survey: No. 118

7) TOWNSHIP
36N

8) RANGE
11E

9) U.T.M.
Northing: 4189977-4190351; Easting: 250020-250382

10) PROJECT DESCRIPTION
Phase I survey for proposed 16-acre borrow area for Bois Brule levee grade restoration project (Figure 1).

11) TOPOGRAPHY
Ridge summit

12) SOILS
Menfro silt loam (plowzone) overlying silty clay loam subsoil

13) DRAINAGE
Mississippi 1 watershed of the Middle Mississippi drainage basin (Figure 2)

14) LAND USE/GROUND COVER (INCLUDING % VISIBILITY)
Ridge summit in pasture grass (0-5% visibility with 10-35% visibility in disturbed area); ridgeslopes were wooded (0-20% visibility).

15) SURVEY LIMITATIONS
None

HISTORICAL BACKGROUND INFORMATION

16) HPP - CULTURAL RESOURCE INVENTORY ☑

17) ARCHAEOLOGICAL SURVEY OF MISSOURI ☑

18) GIS DATABASE ☑

19) HISTORIC PLATS/ATLASES/SOURCES
See continuation sheet

20) PREVIOUSLY REPORTED SITES
See continuation sheet

21) PREVIOUS SURVEYS
See continuation sheet

22) REGIONAL SOURCES UTILIZED

23) MASTER PLAN RECOMMENDATION

24) INVESTIGATION TECHNIQUES

Ridge summit was shovel tested at 15-x-15-m intervals with visual survey of disturbed areas that exhibited 25-35% visibility. Steep ridgeslopes were visually surveyed at 25-m intervals.

25) TIME EXPENDED
16 PERSON HOURS

26) HISTORIC PROPERTIES LOCATED
One prehistoric site (23PY1723) was located during the survey

27) CULTURAL MATERIALS
A total of 71 lithic artifacts were recovered from the site: 46 from the surface in disturbed areas at the west end of the site, 19 from 16 positive shovel tests, and six from Mini Test Unit 1 (50-x-50 cm). These artifacts consist of one unidentifiable projectile point/knife, one tertiary biface fragment, three utilized flakes, one primary flake, four tertiary flakes, 16 biface flakes, 31 flake fragments, 10 pieces of shatter, and four pieces of fire-cracked rock. The vast majority (90.4%) of the flake debitage consists of middle-to-late-stage reduction of bifaces and resharpening of dulled biface edges.

28) CURATED AT
Missouri State University

29) COLLECTION TECHNIQUES
All surface artifacts and all artifacts found in shovel tests were collected.

30) AREA SURVEYED (ACRES & SQUARE METERS)
16 acres (64,750 sq. m)

31) RESULTS OF INVESTIGATION AND RECOMMENDATIONS:

[ ] a) No Historic Properties Located.

[X] b) No National Register Eligible Historic Properties Located.

[ ] c) National Register Eligible Historic Properties Located.

[ ] d) Historic Properties May Meet Requirements For National Register Eligibility; Phase II Testing Is Recommended:

e) Comments: See continuation sheet

CULTURAL RESOURCE MANAGEMENT CONTRACTOR INFORMATION

32) ARCHAEOLOGICAL CONSULTANT

Center for Archaeological Research

33) ADDRESS/PHONE

Missouri State University, 901 South National, Springfield, Missouri 65897 (Phone: 417-836-5363)

34) SURVEYOR(S)

Jack H. Ray and Jennifer A. Rideout

35) SURVEY DATE(S)

February 25-26, 2019

36) REPORT COMPILED BY

Jack H. Ray and Jennifer A. Rideout

37) DATE

March 12, 2019

38) SUBMITTED BY (SIGNATURE AND TITLE)

Jack H. Ray, Asst. Director

Jack H. Ray

39) **ATTACHMENT CHECK LIST:** (REQUIRED)

[x] 1) Relevant Portion of USGS 7.5' Topographic Quadrangle Map(s) Showing Project Location and Any Recorded Sites;

[x] 2) Project Map(s) Depicting Survey Limits and, when applicable, Approximate Site Limits, and Concentrations of Cultural Materials;

[x] 3) Site Form(s): One Copy of Each Form;

[ ] 4) All Relevant Project Correspondence;

[x] 5) Additional Information Sheets as Necessary.

40) ADDRESS OF OWNER/AGENT/AGENCY TO WHOM SHPO COMMENT SHOULD BE MAILED

1222 Spruce Street

St. Louis, MO 63103

41) CONTACT PERSON

Mark Smith

42) PHONE NUMBER

(314) 331-8831

REVIEWER COMMENTS

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

20 March 2019

Engineering and Construction Division
Curation and Archives Analysis Branch

Ms. Devon Frazier
Tribal Historic Preservation Officer
Absentee-Shawnee Tribe of Indians of Oklahoma
2025 S. Gordon Cooper Drive
Shawnee, OK 74810-9381

Subject: Bois Brule Levee and Drainage District, Perry County, Missouri, and Randolph County, Illinois

Dear Ms. Frazier:

The USACE, St. Louis District (District) is contacting your tribe to initiate consultation for the above designated project under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and its implementing regulation 36 CFR 800. The Bois Brule Levee and Drainage District is located in Perry County, Missouri, and Randolph County, Illinois, on the right descending bank of the Mississippi River between River Miles 94 and 111 above the Ohio River (enclosure).

A 2003 Design Deficiency Correction Project Report and Environmental Assessment (EA) describes several measures to correct design deficiencies, such as restoring the height of the back levee to the authorized height, constructing additional relief wells, seepage berms, a cutoff trench, and pump stations. In addition to these features, the 2003 EA also describes the borrow requirements for the recommended project. A total of approximately 850,000 cubic yards of borrow would be required to construct the recommended features. Specific borrow areas were identified in 2003. However, some of the identified areas were commercial quarries. These quarries have been in full operation since 2003, resulting in insufficient quantities available to fulfill borrow requirements for the construction of the design deficiency corrections.

In order to fulfill borrow requirements, the Hayden Borrow Area (enclosure) was identified as a potential borrow source during the final design of the project features. The Hayden Borrow Area has the potential to produce approximately 500,000+ cubic yards of borrow material, which in combination with the remaining borrow areas identified in 2003, would produce the quantity of borrow needed to construct the Design Deficiency Correction Project and reduce flood risk within the Bois Brule Drainage and Levee District.

An archaeological consultant was contracted by the District to perform a Phase I archaeological survey of the Hayden Borrow Area. A summary of that survey is enclosed. Upon review of the results of the Phase I archaeological survey, the nature of the landform, and the previous history or partial site disturbance, it is the District's current opinion that this action will have no effect on historic properties.

If your tribe has any questions, comments, or areas of concern please contact me at (314) 331-8784, or Chris Koenig at (314) 331-8151, or christopher.j.koenig@usace.army.mil.

Sincerely,

Rochelle R. Hance
Chief, Curation and Archives Analysis Branch

Enclosures

Tribal Leaders

Title	Name (First, Middle, Las	Tribe	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	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 Representatives

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