Environmental Assessment

with

Finding of No Significant Impact

Regulating Works Project

Dogtooth Bend Phase 6

River Miles 34-33 Left Descending Bank

on the Middle Mississippi River

Alexander County, Illinois

July 2016

US Army Corps of Engineers
St. Louis District

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Contents

List of Figures

List of Tables

List of Appendices

1. Purpose of and Need for Action

1.1 Introduction

The U.S. Army Corps of Engineers (Corps), Mississippi Valley Division (MVD), St. Louis District (District), proposes to undergo construction activities in the near-term to stabilize the bankline and scour hole and pursue a long-term construction solution to reduce the risk of a channel cutoff forming in the Mississippi River near river miles (RM) 33-34.

This Final Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) have 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 Corps Engineering Regulation 200-2-2.

1.2 Authorization

The Congress of the United States, through the enactment of a series of Rivers and Harbors Acts beginning in 1824, authorized the Secretary of the Army, by and through the District to provide a safe and dependable navigation channel, currently 9 feet deep and not less than 300 feet wide with additional width in the bends as required, on the Middle Mississippi River (MMR)[1]. The MMR is defined as that portion of the Mississippi River that lies between its confluence with the Ohio and Missouri rivers (Figure 1). This ongoing effort is also commonly referred to as the Regulating Works Project (hereinafter referred to as the Project). The Project utilizes bank stabilization and sediment management to maintain bank stability and ensure adequate navigation depth and width. Bank stabilization is achieved by revetments, while sediment management is achieved by river training structures (also referred to as regulating works structures). Other activities performed to obtain the navigation channel are rock removal and construction dredging. The Project is maintained through dredging and any needed maintenance to already constructed features. Therefore, both regulating works structures and dredging are all part of the overall Regulating Works Project. The long-term goal of the Project, as authorized by Congress, is to provide a sustainable and safe navigation channel and reduce federal expenditures by alleviating the amount of annual maintenance dredging and the occurrence of vessel accidents through the construction of regulating works. Due to the number of sharp bends in the MMR, the St. Louis District continually monitors severe bank erosion areas that could potentially result in a navigation

[1] Congress originally authorized the project of improving navigation of the Mississippi River from the mouth of the Missouri to New Orleans in the Rivers and Harbors Act dated May 24, 1824, by the removal of trees that were endangering the safety of navigating the river. In the Rivers and Harbors Act dated Jun 10, 1872, Section 2, Congress mandated that an examination and/or survey be completed of the Mississippi River between the mouth of the Missouri River and the mouth of the Ohio River, providing the first Congressional action to define this portion of the Mississippi River as distinct from the rest of the Mississippi River. Congress authorized the specific improvement of the Mississippi River between the mouth of the Missouri River and the mouth of the Ohio River in the Rivers and Harbors Act dated March 3, 1873. Between 1874-1892, Congress expanded this section of the Mississippi River to include that portion between the mouth of the Missouri River and the mouth of the Illinois, but in the Rivers and Harbors Act dated July 13, 1892, Congress removed this additional section of the river and once again referred to it as the Mississippi River between the mouth of the Ohio River and the mouth of the Missouri River. In the Rivers and Harbors Act dated June 25, 1910, Congress provided exactly how this Project was to be carried out by authorizing the construction, completion, repair, and preservation of "[i]mproving [the] Mississippi River from the mouth of the Ohio River to and including the mouth of the Missouri River: Continuing improvement in accordance with the plan adopted in [1881], which has for its object to eventually obtain by regularization works and by dredging a minimum depth." The 1881 plan called for the removal of rock hindering navigation, the contraction of the river to compel the river to scour its bed (now known as regulating works), and to be aided by dredging, if necessary. The 1881 plan also provided for bank protection improvements (now known as revetment) wherever the river is causing any serious caving of its banks. (Letter from the Secretary of War, dated November 25, 1881, 47th Congress, 1st Session, Ex. Doc. No. 10). The Project's current dimensions of the navigation channel were established in the Rivers and Harbors Act dated January 21, 1927 and July 3, 1930. The Rivers and Harbors Act dated January 21, 1927 modified the Project pursuant to the Chief of Engineers recommendations, which further detailed the purpose of the Project to construct the channel through regulating works and augment this by dredging, stating that dredging should be reduced to a minimum. The Project was also later modified to provide for the Chain of Rocks Canal and Lock 27 in Rivers and Harbors Acts dated March 2, 1945 to address the rock formation hindering navigation in this area, and the rock filled low water dam at the Chain of Rocks was authorized in the Rivers and Harbors Act dated July 3, 1958 to assure adequate depth over the lower gate sills at Lock and Dam 26.

channel cutoff and takes appropriate action to prevent this potentially catastrophic event from happening.

To the extent possible under existing authorities, environmental laws, regulations, and policies, the District considers the environmental consequences of its activities as it constructs and operates the Project and acts accordingly. An important component of each activity is the use of scientific, economic, and social knowledge to understand the environmental context and effects of District actions in a collaborative manner, employing an open, transparent process that respects the views of Federal and State stakeholders, individuals, and groups interested in District activities.

1.3 Work Area Description

The work area is located in Alexander County, Illinois and is adjacent to the left descending bank of the Mississippi River at Mississippi River at approximately river miles 34-33 (

Figure 2). The work area is within the Len Small Drainage and Levee District (D&LD) which is a non-federal levee system that reduces risk to primarily agricultural lands. The levee reduces risk from a flood event having at least a 20% chance or larger of occurring in any given year. The system consists of over 16.5 miles of levee constructed with a 10-foot crown width and 1 on 2.5 side slopes.

1.4 Need for Action

The District proposes to improve the undesirable conditions within the proposed work area due to the high water event of late December 2015- early January 2016. The Len Small levee near Miller City, Illinois sustained significant damage, most notably a nearly mile-long levee breach with associated floodplain scouring, which also included a failure of the adjacent Mississippi River bankline (Figure 3). The emergency bankline repair at the site started on 26 January 2016 and consisted of re-establishing the bankline immediately adjacent to the levee breach with a notch remaining for access for potential future work. The bankline repair was performed using Operations and Maintenance (O&M) funds and was completed on 16 February 2016 (considered to be Phase 1 of this work). Maintenance of the navigation channel in this reach of river requires additional action to reduce the risk of a channel cutoff that would result in a loss of 13.5 miles of river (Figure 4). In terms of the levee repair, the Len Small D&LD has submitted a letter requesting assistance through the Public Law 84-99 (PL 84-99) Program to repair the levee. However, there is an imminent need to pursue federal action under the Regulating Works Project, which is intended to ensure the stability of the navigation channel. Site conditions are highly undesirable and threatening the stability of the navigation channel. These undesirable conditions include (1) unstable bankline; (2) advancing scour hole; and (3) high risk of a channel cutoff forming.

In general, a channel cutoff occurs when a meander bend in a river is breached and the channel connects the two closest parts of the bend. Cutoffs are a natural evolution for meandering rivers, but in terms of maintaining a safe and reliable navigation channel a channel cutoff poses a detrimental risk to navigation and to adjacent lands. A channel cutoff would result in loss of existing channel, near-term high velocities, high levels of scour, increased potential for a headcut to form, channel incision undercutting navigation structures, and the change in river slope would make the rock at Thebes come into effect at a higher frequency restricting traffic. Action is needed to ensure a safe and reliable navigation channel. The proposed action under the Regulating Works Project took into consideration the designs from the proposed PL 84-99 levee repairs; and the proposed features under the Regulating Works Project can stand alone or work with the actions taken to repair the levee to reduce the risk of a channel cutoff and further bankline degradation and floodplain scour.

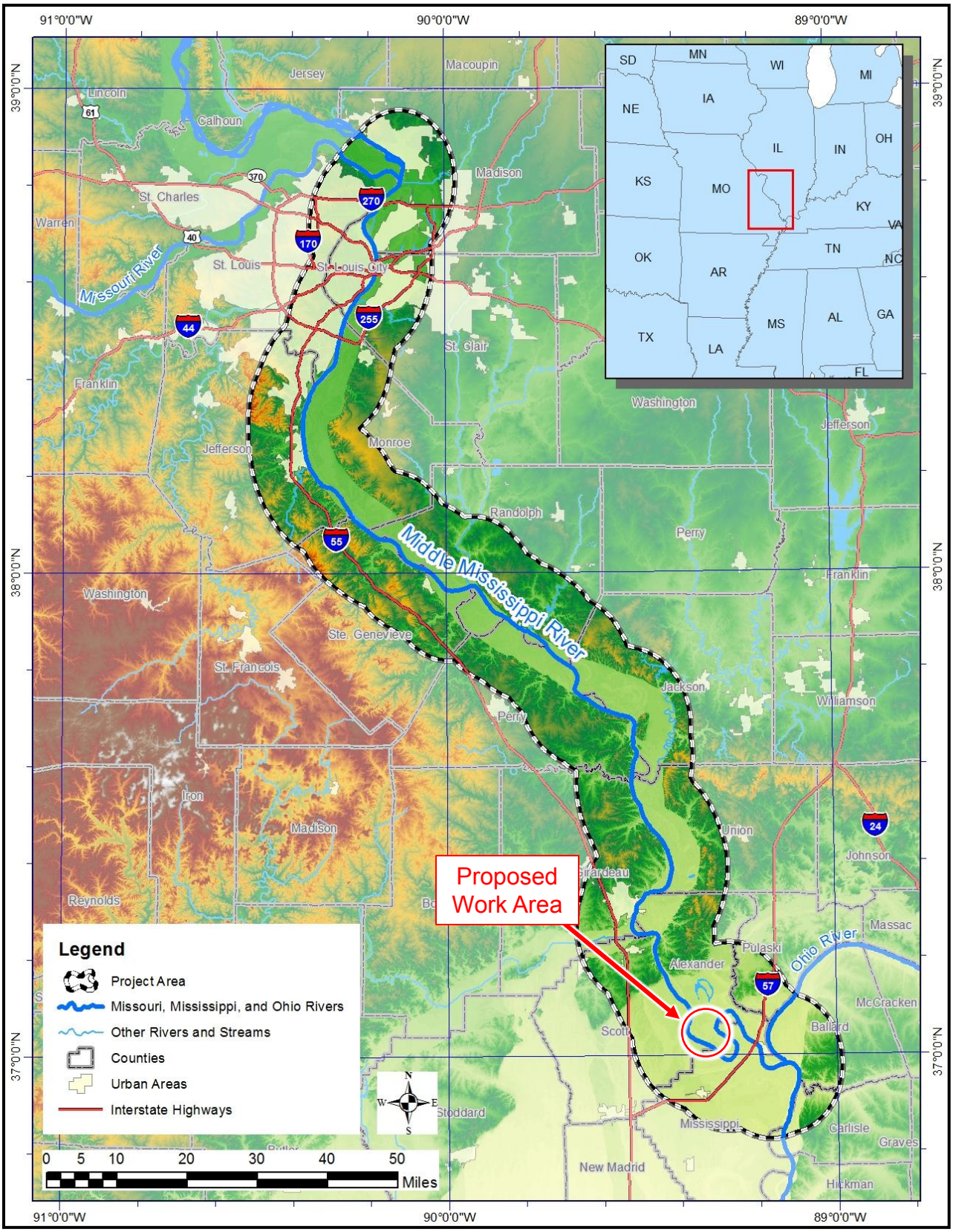

Figure 1. The proposed work area in relation to the Regulating Work Project Area.

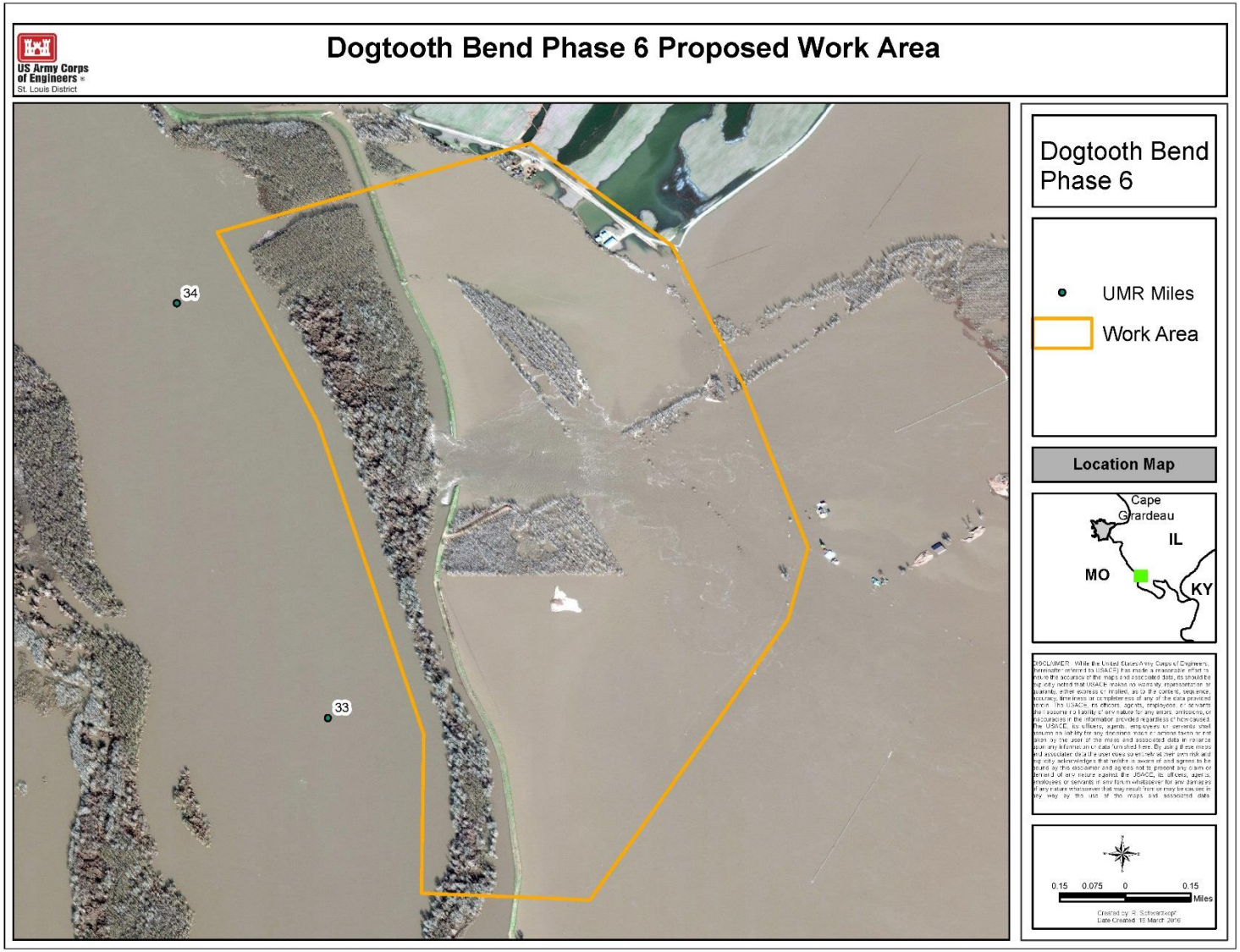

Figure 2. Location map of the Proposed Work Area

Figure 3. Bankline failure during January 2016

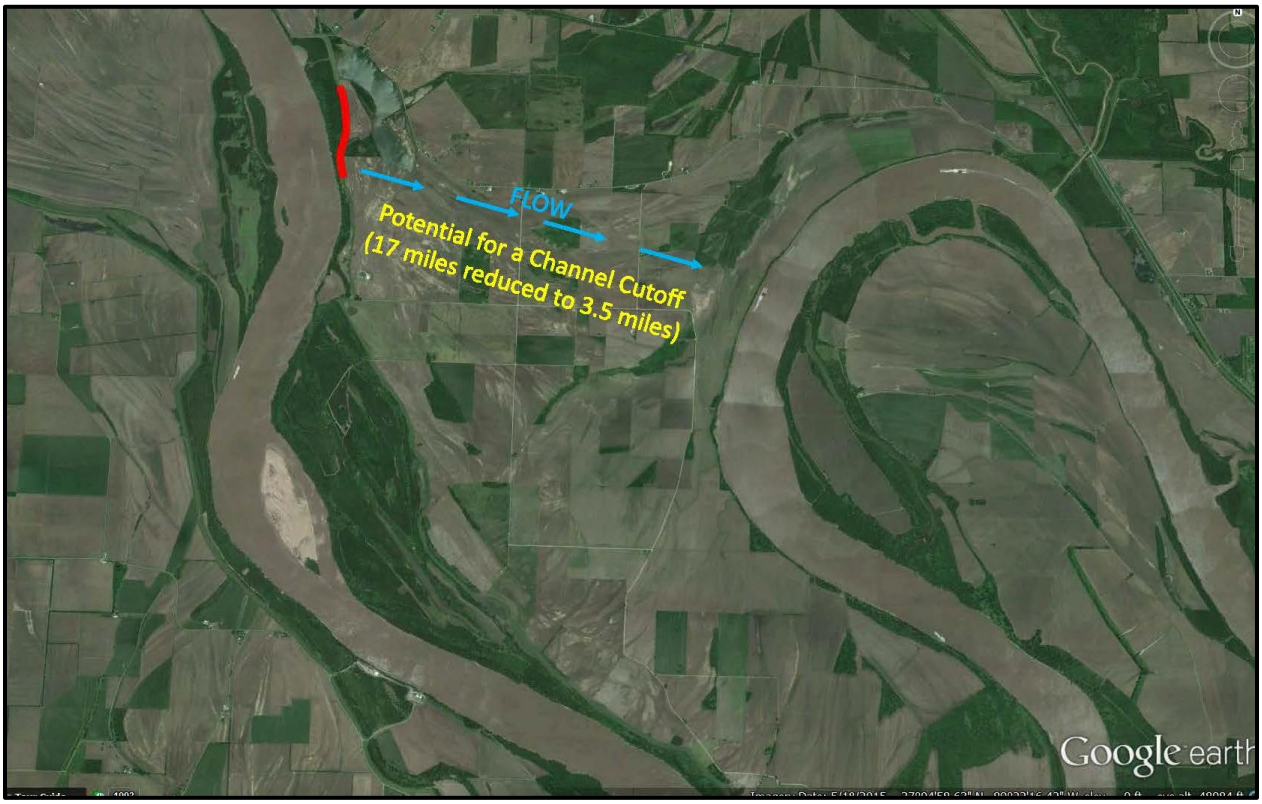

Figure 4. Location of Potential Channel Cutoff

1.5 Objectives (the Purpose) for the Proposed Federal Action

Through the enactment of a series of Rivers and Harbors Acts beginning in 1824, Congress authorized the Secretary of the Army, by and through the Corps to provide a safe and dependable navigation channel. The overall purpose of the proposed federal action is to ensure a safe and dependable navigation channel in the proposed work area by:

1) Stabilizing the degraded bankline in the near-term;
2) Stabilizing the advancing the scour hole in the near-term; and
3) Reducing the risk of a channel cutoff forming in the long-term.

1.6 Federal Decision

The Dogtooth Bend Phase 6 focuses on proposed construction activities in the short-term (i.e., stabilize bankline and scour hole) and the long-term (i.e., reduce risk of channel cutoff) that would ensure a safe and dependable navigation channel in the proposed work area.

The federal action of selecting a preferred alternative for potential implementation would be determined by the U.S. Army Corps of Engineers, the St. Louis District Engineer. The District Engineer would also determine, based on the facts and recommendations contained herein, whether this Final EA is adequate to support a FONSI or whether an Environmental Impact Statement (EIS) would need to be prepared.

1.7 Prior Reports

This site-specific Environmental Assessment (EA) is tiered off of the 1976 Environmental Impact Statement (1976 EIS) covering the District's Regulating Works Project – *Mississippi River between the Ohio and Missouri Rivers (Regulating Works)*, (USACE, Environmental Statement, Mississippi River between the Ohio and Missouri Rivers (Regulating Works), 1976). The 1976 EIS was recently reviewed by the District to determine whether or not the document should be supplemented. The District has concluded that the Regulating Works Project has not substantially changed since 1976 but that there are significant new circumstances and information on the potential impacts of the Regulating Works Project on the resources, ecosystem and human environment to warrant the preparation of a Supplemental EIS (SEIS).

The significant new circumstances and information on the potential impacts of the Regulating Works Project relevant to this EA include the following:

- New federally threatened and endangered species have been listed since preparation of the 1976 EIS. Information on threatened and endangered species and impacts on those species can be found in Section 3, Section 4, and Appendix A, *Biological Assessment* of this document.
- The District has implemented new programs to restore fish and wildlife habitat on the MMR. Information on the Biological Opinion Program can be found in Section 4 of this document.

The Dogtooth Bend Phase 6 EA incorporates new information and circumstances relevant to the impacts of the action on the environment to the greatest extent possible. Should the analyses undertaken as part of the SEIS process reveal any new impacts on the resources, ecosystem, and human environment not accounted for in this EA, measures would be taken within our authority to avoid, minimize, and/or compensate for the impacts during that process as appropriate. Information on the SEIS can be found on the District's SEIS web site:

http://www.mvs.usace.army.mil/Missions/Navigation/SEIS.aspx

In addition to the above report, in the vicinity of the proposed work area a previous EA was prepared for a levee repair and provided existing conditions information relevant to the Dogtooth Bend Phase 6 Final EA.

U.S. Army Corps of Engineers. 2012. Environmental Assessment with Finding of No Significant Impact. Levee Repair (PL 84-99): Len Small Drainage and Levee District, Alexander County, Illinois. Prepared by USACE, St. Louis District.

This EA describes the damages sustained to a portion of the Len Small D&LD in the 2011 high water event which consisted of a 1,300-foot breach along with associated bed scouring. It describes levee damage, repair alternatives, the existing environment, and potential environmental impacts associated with each alternative.

2. Alternatives Including the Proposed Action

This section both describes the alternatives (potential actions) and compares the alternatives in terms of their environmental differences and their achievement of project objectives (from Section 1.5). The No Action Alternative, as required by NEPA, is also analyzed.

Alternative 1 - No Action. Under No Action, the Corps through the Regulating Works Project would neither stabilize the bankline and scour nor reduce the risk of a channel cutoff from forming. The current situation as described as described in Chapter 1 would continue. Maintenance of existing navigation structures and revetment in the vicinity of the proposed work area would continue. See Chapter 3 for a more detailed profile of the current environmental situation within the proposed work area.

*Alternative 2 – Phased Approach (Proposed Action). Dogtooth Bend Phase 6 consists of two priority activities, Phase 2 and activities, Phase 2 and Phase 3 (**Error! Reference source not found.** and*

Figure 5), which took into consideration potential actions under any PL 84-99 levee repair. The Corps would be pursuing Phase 2 activities in the near-term to meet project objectives; however, Phase 3 activities would not be pursued without further engineering design and stakeholder input. Phase 2 activities would be needed regardless of the Len Small levee restoration to meet the project objectives. In Phase 3, the Corps would be pursuing a construction solution such as a grade control structure if the Len Small levee is not restored; however, the location and design of this type of feature has not be determined. Since this action is reasonably to occur in the foreseeable future, this current EA would assess impacts of the feature in general terms. Once further information has been obtained for this feature, the Corps would prepare a supplement/addendum to this EA which would assess the impacts of this feature on the human environment.

Phase 2 activities would consist of stabilizing the southern levee end (A_1), stabilizing the northern levee end (A_2), stabilizing the perched scour north of the bankline breach (A_3), establishing a stone blanket at the riverside toe of the northern intact levee section (A_4), and constructing a kicker dike to act as a false bankline to divert high flows away from the existing scour hole (C_1). Figure 6 depicts the location of the Phase 2 permanent structures. Construction would require both land-based and water-based access to build the rock structures. Land-based construction would require building haul roads (Figure 6). Water-based construction would require dredging to access the area. Approximately 26,000 cubic yards of material would be dredged. Dredge spoil placement areas have been identified within the proposed work area. Dredge spoil locations were selected based on beneficially using the material to construct the kicker dike, avoiding deep off-channel aquatic habitat, and favoring areas that were highly disturbed from the recent flooding event. Dredging locations and placement areas are provided in Figure 7.

Phase 3 activities would consist of establishing a grade control structure (C_2) within the proposed work area (location to be determined) if the Len Small levee is not restored.

Alternative 3 – Non-Phased Approach. Alternative 3 includes all features from Alternative 2, but would not take into consideration acquiring additional engineering and stakeholder information to make the best informed decision. Due to the high level of uncertainty with location of a grade control structure and uncertainty if the Len Small levee would be restored, and potential impacts, this alternative was deemed infeasible.

Table 1. Work to be completed and purpose

Task	Activity	Work to be Completed	Purpose	Stone Quantities
Phase 2	A_1	Stabilize southern levee end by establishing a grade that would support rock placement, and then armoring the levee ends	To reduce potential risk of channel cutoff and to prevent further degradation from additional high water	10,400 TN
	A_2	Stabilize northern levee end by establishing a grade that would support rock placement, and then armoring the levee ends	To reduce potential risk of channel cutoff and to prevent further degradation from additional high water	6,500 TN

	A_3	Stabilize the perched scour hole north of the bankline breach along the bank by armoring the hole's bank adjacent to the river bank	To reduce potential risk of channel cutoff	6,500 TN
	A_4	Establish a stone blanket at the riverside toe of the northern intact levee section from the levee end back approximately 300 feet to the 1993 repair	To reduce potential risk of channel cutoff	6,500 TN
	C_1	Construct a kicker dike off of the bankline repair of Phase 1	To reduce potential risk of channel and act as a false bankline.	72,800 TN
Phase 3	C_2	Establish grade control structure if Len Small levee not restored	To reduce potential risk of channel cutoff	TBD

Figure 5. Work areas related to Phase 2. Blue dash lines are proposed location of project features.

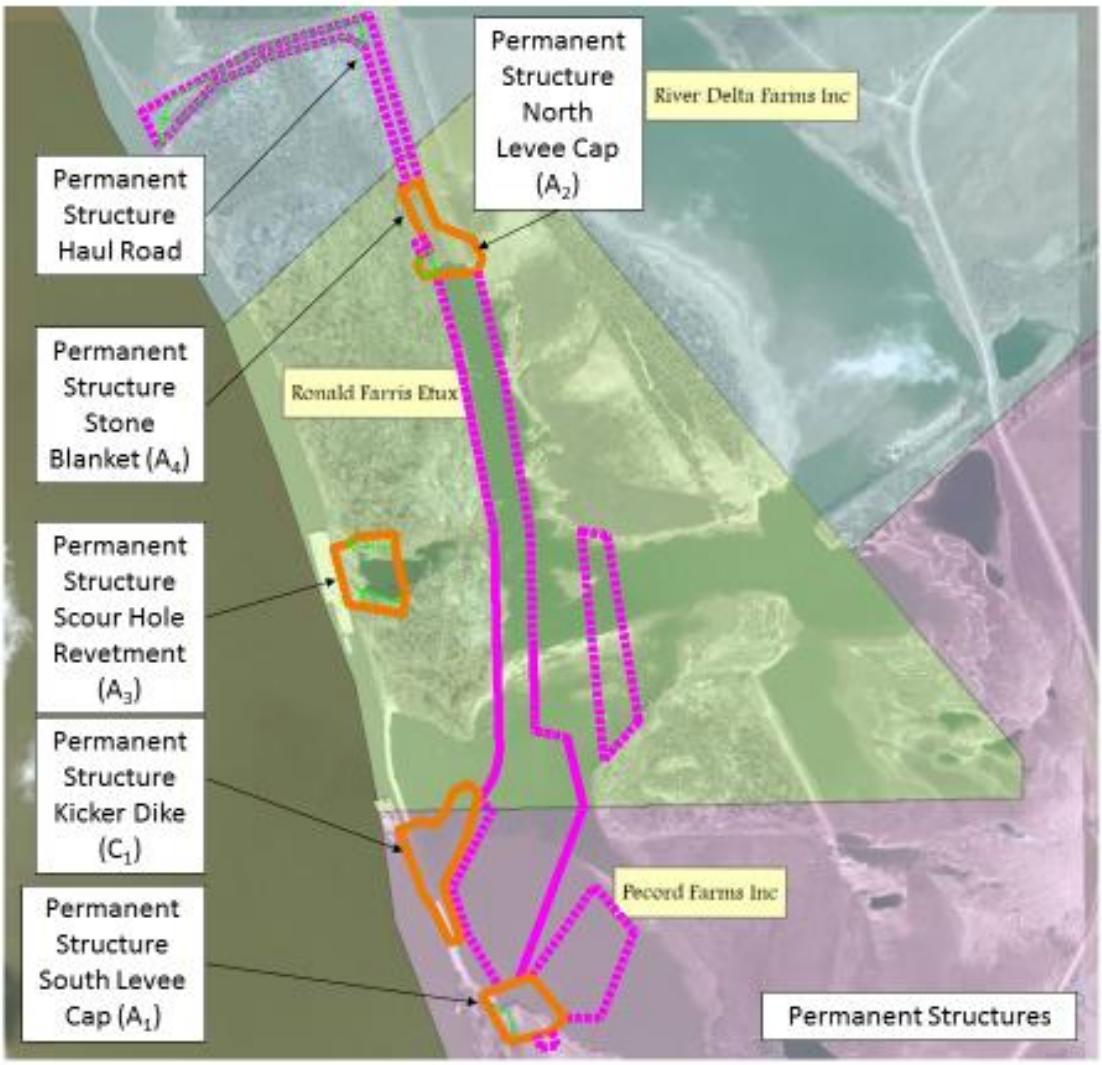

Figure 6. Permanent structures (A_{1-4} and C_1) outlined in orange. Temporary structures/access outline in pink. Proposed tree clearing in green.

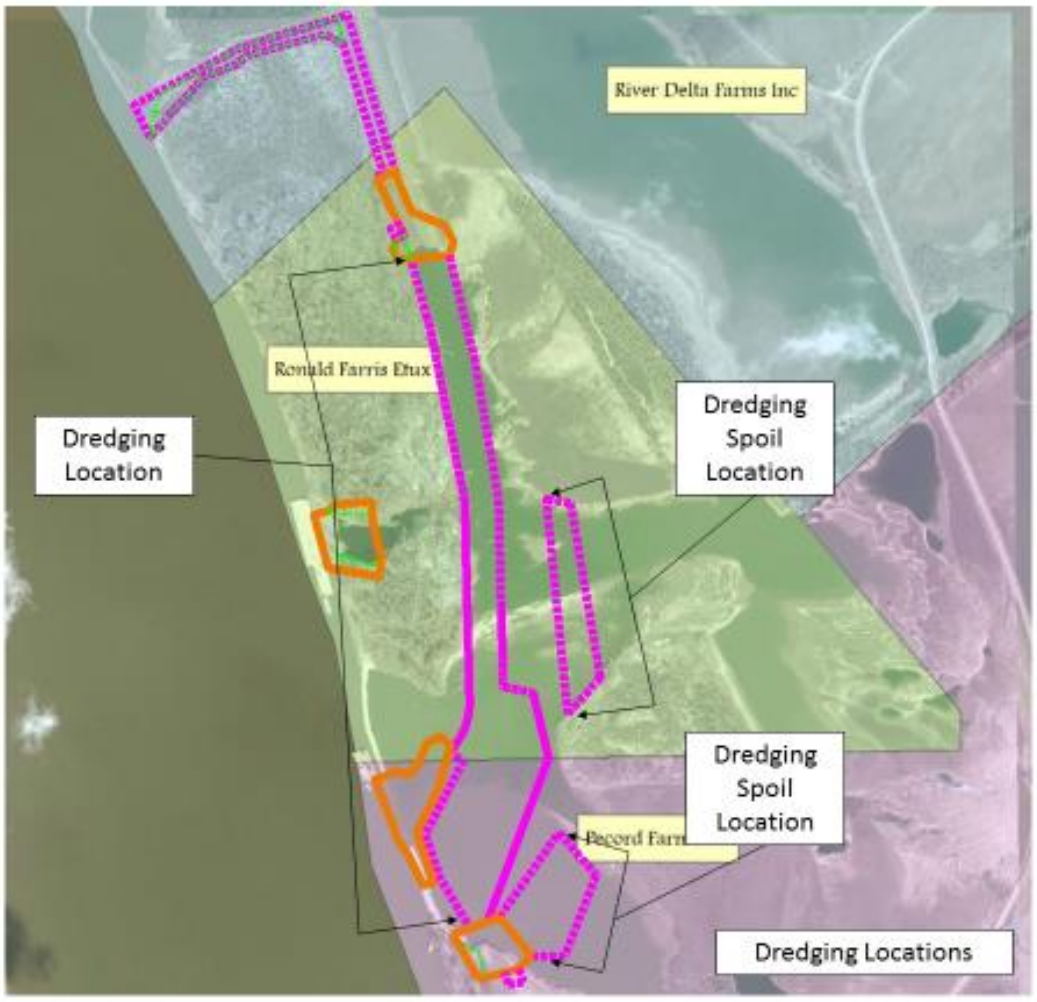

Figure 7. Location of dredging and dredge spoil locations.

2.1 Development of Alternatives

The District has concluded Alternatives 1 and 2 are the only reasonable alternatives that meet the Project purpose and should be extensively evaluated. The District's alternative evaluation process considered only those alternatives that would obtain and maintain a safe and reliable 9-foot navigation channel in the work area to be consistent with the objectives and the authority of the Middle Mississippi River Regulating Works Project. The only reasonable, feasible, and authorized methods to reduce the risk of a channel cutoff are through stabilizing the bankline, scour hole, and constructing a grade control structure (yet to be determined). Therefore, pursuant to the Project's authority to protect the bankline, the District began developing alternatives to minimize the degradation from additional high water in this reach of the river, thereby providing a safe and reliable navigation channel.

For the Dogtooth Bend Phase 6 work area, the District developed alternatives using widely recognized and accepted river engineering guidance and practice. A design charette was held on 29 February 2016

to discuss the navigation recommendation for Dogtooth Bend Phase 6 bankline repair. The guiding principles of the discussion were as follows: 1) reduce risk of channel cutoff from forming, 2) decrease potential for future damage, 3) a phased approach would potentially be necessary based on funding, and 4) take into consideration environmental resources (i.e., existing riparian corridor and scour hole as aquatic habitat). The charette participants reviewed the recent LIDAR (collected week of 21 February 2016) and bathymetric data (collected week of 14 February 2016) to develop a path forward for the repair. From these surveys, the group worked under the following elevation assumptions:

- Levee – southern tie-in elevation: 342 feet NAVD88
- Levee – northern tie in elevation: 344 feet NAVD88
- High Bank: 332 feet NAVD88
- Elevation of 2016 Bankline repair: 318 feet NAVD88
- Elevation of 1993 Bankline repair: 319 feet NAVD88
- Low Bank, toe of northern levee: 324 feet NAVD88
- Scour hole bank (northern): 326 feet NAVD88
- Scour hole bank (southern): 323 feet NAVD88
- Miller City Road: 328 feet NAVD88
- High ground spur: 329 feet NAVD88
- Middle High ground: 330 feet NAVD88

In order to determine the best alternative, certain criteria, based on the purpose and goals of the work, were used to evaluate each alternative. The foremost considerations were that the alternative had to prevent further degradation of the existing bankline, reduce advancement of the scour hole from additional high water, and to reduce the risk of a channel cutoff. An additional consideration was that the design should incorporate measures intended to avoid and minimize negative impacts to the environment (i.e., minimize changes to the existing riparian corridor and place value on the scour hole as new off-channel aquatic habitat), so long as the primary goal of preventing a channel cutoff was not compromised. A number of alternatives were proposed beyond the recommended alternative. Some of the other alternatives considered but deemed infeasible, included armoring Miller City Road as a de facto grade control structure, revetting the scour hole, or using trench fill revetment and filling and capping the scour hole. Table 2 summarizes the considered alternatives and rationale for why they were not considered for further analysis.

Table 2. Alternatives not moved forward for further analysis

Alternative Description	Reason(s) why not considered for further analysis
Armoring Miller City Road as a de facto grade control structure	Not effective – risked additional damage to essential roadway
Revetting the scour hole	High cost
Revetting the scour hole (trench fill)	High cost
Filling the scour hole	High cost, loss of scour hole for aquatic habitat

Based on the evaluation of alternatives, the District determined that the Proposed Action (Alternative 2) would be the only reasonable alternative to meet project objectives.

2.2 Summary of Environmental Consequences

The impacts of each Alternative on the human environment are covered in detail in Section 4, Environmental Consequences. Table 3 provides a summary of the impacts of each Alternative by resource category.

Table 3 Summary of impacts of the "No Action" and the "Proposed Action" Alternatives.

	"No Action" Alternative	**"Proposed Action" Alternative**
Achievement of Project Objectives	Does not reduce the potential for channel cutoff, and, therefore, does not meet the Project objectives.	Is expected to reduce further degradation of bankline and advancement of scour hole, thereby reducing potential of channel cutoff. Thus, reducing future federal expenditures if navigation channel is lost, and meets Project objectives.
Impacts on Stages	No impacts anticipated.	No impacts anticipated.
Impacts on Water Quality	Potential increased sedimentation resulting from channel cutoff and head-cutting; increased agricultural chemicals entering system through runoff	Localized, temporary increase in suspended sediment concentrations during construction activities.
Impacts on Air Quality	Minor, local, ongoing impacts due to agricultural activities.	Temporary, minor, local impacts due to one-time use of construction equipment.
Impacts to Geology, Soils and Prime Farmland	Susceptible to channel cutoff and scour potentially degrading quality.	Construction activities may cause temporary disturbances in the vicinity of the structure locations. The impact would be localized and would dissipate quickly.
Impacts on Fish and Wildlife	Increase risk of headcut, bankline degradation and potential loss of main channel border habitat as well as decreased connectivity of side channels. Potential oxbow lake formation providing disconnected off-channel habitat.	Avoidance of sites during construction. Maintain existing main channel border habitat. Conversion of riparian forest habitat. Sedimentation/filling in of existing off-channel scour hole.
Impacts on T&E Species	May affect but not likely to adversely affect threatened and endangered species.	May affect but not likely to adversely affect threatened and endangered species.
Impacts on Navigation	Loss of existing channel; near-term high velocities; high levels of scour; headcut would ensue; channel incision undercut navigation structures; change in river slope would make rock at Thebes come into effect at a higher frequency restricting traffic.	Reduces risk of channel cutoff; able to maintain a safe and reliable navigation channel.
Impacts on Historic and Cultural Resources	May affect known and unknown historic and cultural resources	No known historic resources would be affected. Impacts to unknown historic and cultural resources unlikely.

3. Affected Environment

This section presents details on the historic and existing conditions of resources within the work area that would potentially be affected by Project-related activities. The section is broken into four resource categories: physical resources, biological resources, socioeconomic resources, and historic and cultural resources. This section does not address impacts of the Alternatives, but provides a background against which Alternatives can be compared in Section 4, Environmental Consequences.

3.1 Physical Resources

Stages – Stages have been decreasing over time for flows below 200,000 cfs at the St. Louis gage (Figure 8). For other in-bank flows between 200,000 cfs and 500,000 cfs there has been no change over time. There is a slight upward, but statistically insignificant trend for stages at the overbank flow of 700,000 cfs. For stages at Chester with flows at 300,000 cfs there was a slightly increasing trend, and for lower in-bank flows up to 200,000 cfs have decreased with time. For overbank flows of 500,000 cfs and 700,000 cfs, there were slight increasing trends observed at the Chester gage. Huizinga (2009) and Watson et al. (2013a) attributed the slight increase in out of bank flows to the construction of levees and the disconnection of the river from the floodplains. Both Watson et al. (2013a) and Huizinga (2009) observed a shift occurring in the out of bank flows in the mid-1960s and attributed it to the completion of the Alton to Gale levee system which paralleled the entire MMR.

Water Quality - Consideration of water quality encompasses a wide range of physical, hydrologic, and biological parameters. Watershed influences, including tributary streams, point and non-point pollution sources, flow alteration due to navigation structures, and drought and flood events all influence water quality. Variations in land use practices, cover types, and watershed area will determine the level and type of sediment, nutrient, and contaminant inputs into the Mississippi River and its tributaries. The Mississippi River has a long history of water quality impairment due to contamination from industrial, residential, municipal, and agricultural sources. Recent changes in wastewater treatment laws and technologies, regulation of point source discharges, and changes in public awareness have contributed to overall improvements in water quality.

Section 303(d) of the Clean Water Act requires states to generate lists of impaired water bodies every two years. Impaired water bodies are those that do not meet state water quality standards for the water bodies' designated uses. On the 2014 303(d) list for Illinois, the Mississippi River in the vicinity of the work area was listed as impaired (IEPA, 2015).

Illinois has 2015 fish consumption advisories for the Mississippi River for sturgeon (all sizes, one meal per month) due to PCB contamination (IDPH, 2015).

Air Quality - The Clean Air Act requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead. EPA regulates these pollutants by developing human health-based or environmentally-based permissible pollutant concentrations. EPA then publishes the results of air quality monitoring, designating areas as meeting (attainment) or not meeting (nonattainment) the standards or as being maintenance areas. Maintenance areas are those areas that have been re-designated as in attainment from a previous nonattainment status. A maintenance plan establishes measures to control emissions to ensure the air quality standard is maintained in these areas. Alexander County, Illinois is designated as attainment for all 6 criteria air pollutants (IEPA, 2015).

Geology & Soils - The proposed work area lies in the floodplain of the Middle Mississippi River. The landscape is typical ridge and swale topography created by the river as it migrated across the floodplain.

The low ridges in the floodplain are typically composed of sandy or silty material, while the lower swales have surface soils that are typically silty clays.

Prime Farmland – Within the proposed work area (approximately 650 acres), 6 acres are classified as prime farmland. These 6 acres of prime farmland are not within the footprint of proposed constructed features. Within the Len Small D&LD all available farmland is being farmed. Currently, the prime farmland in the vicinity of the work area is susceptible to high water events and associated scour.

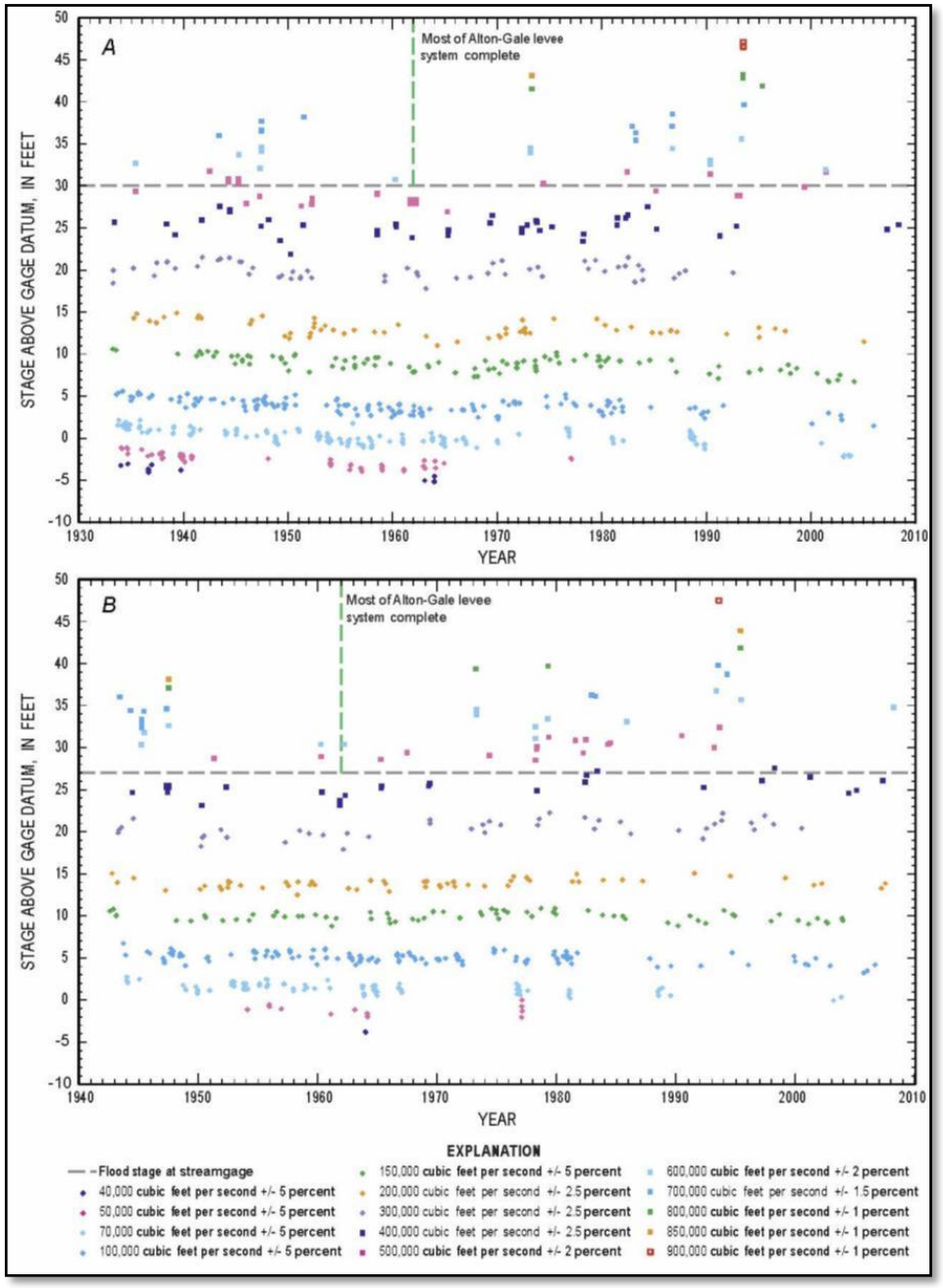

Figure 8. Stage for a given discharge range with time from measurements made at the stream gages at (A) St. Louis, Missouri, and (B) Chester, Illinois, on the Middle Mississippi River (from Huizinga 2009).

3.2 Biological Resources

Fish and Wildlife - The changes in fish and wildlife habitat in the Mississippi River Basin that have occurred over the past 200 years are well documented. Many studies have analyzed the historic changes in habitat in the Mississippi River Basin from pre-colonization times to present day (Simons, Schumm, & Stevens, 1974; UMRBC, 1982; Theiling, et al., 2000; WEST, 2000; Heitmeyer, 2008). A variety of actions have impacted the makeup of the Mississippi River Basin since colonization including urbanization, agriculture, levee construction, damn construction, and river training structure placement.

The Corps submitted an EcoCAT request to Illinois Department of Natural Resources on 31 May 2016. State resources of concern include:

- Bumgard Island Illinois Natural Area Inventory Site occurs approximately one mile downstream of the project area.
- State and federally listed Indiana bat, gray bat, and northern long-eared bat (see Threatened and Endangered Species Section below for more details).
- State-threatened Illinois chorus frog (*Pseudoacris illinoensis*): Records occur in the vicinity of the project area, specifically the work proposed at the north levee cap area.
- State-endangered shrimp crayfish (*Orconectes lancifer*) record located in Horseshoe Lake State Conservation Area approximately two miles northeast of the project area.

The fish community in the area is expected to be typical of the Middle Mississippi River fish community in general. The Upper Mississippi River Restoration Long Term Resource Monitoring (UMRR-LTRM) has conducted fish community monitoring in the MMR from river miles 80 to 29. From 2000 to 2014, the UMRR-LTRM collected 99 species of fishes. The most commonly encountered native and non-native species can be found in Table 4 below. Due to the fact that the habitat in the work area is similar to the MMR habitats sampled by the UMRR-LTRM, it is presumed that species composition in the work area would be similar as well.

Table 4. Common species of fish collected in the MMR by LTRM from 2000 to 2014.

Species	Percent of Total Catch by Number	Habitat Use Guild*
Native Species		
Gizzard shad (*Dorosoma cepedianum*)	21.6	Macrohabitat Generalist
Emerald shiner (*Notropis atherinoides*)	11.0	Macrohabitat Generalist
Freshwater drum (*Aplodinotus grunniens*)	10.6	Macrohabitat Generalist
Channel catfish (*Ictalurus punctatus*)	9.9	Macrohabitat Generalist
Channel shiner (*Notropis wickliffi*)	6.7	Fluvial Specialist
Red shiner (*Cyprinella lutrensis*)	3.9	Macrohabitat Generalist
Shortnose gar (*Lepisosteus platostomus*)	3.3	Macrohabitat Generalist
Smallmouth buffalo (*Ictiobus bubalus*)	2.8	Macrohabitat Generalist
River carpsucker (*Carpiodes carpio*)	2.1	Macrohabitat Generalist
Bluegill (*Lepomis macrochirus*)	1.9	Macrohabitat Generalist
White bass (*Morone chrysops*)	1.9	Fluvial Dependent
Black crappie (*Pomoxis nigromaculatus*)	1.1	Macrohabitat Generalist
Blue catfish (*Ictalurus furcatus*)	1.1	Fluvial Specialist
Non-Native Species		
Common carp (*Cyprinus carpio*)	5.6	Macrohabitat Generalist
Silver carp (*Hypophthalmichthys molitrix*)	4.8	Fluvial Dependent

* Habitat use guild classification based on (Galat, et al., 2005a)

Benthic invertebrates are an important part of the river ecosystem as they serve as a food source for a variety of fish and wildlife species. Common benthic invertebrate fauna encountered in the MMR consist of a variety of oligochaete worms, flies, mayflies, caddisflies, and stoneflies. Sampling by Battle et al. (2007) near Cape Girardeau, Missouri showed densities of benthic invertebrates in fine substrates downstream from wing dikes ranging from approximately 3,700 to 11,700 individuals per square meter. Sixty-eight taxa were collected from fine sediments with the dominant groups being oligochaete worms, midges, and mayflies. Densities on rocks on the upstream side of wing dikes ranged from 57,800 to 163,000 individuals per square meter. Fifty taxa were collected from rock substrate with the dominant group being caddisflies.

Benthic invertebrates were also collected from rock surfaces in bend-way weir fields in the MMR at river mile 164 near Oakville, Missouri (Ecological Specialists 1997a) and at river mile 30 near Commerce, Missouri (Ecological Specialists 1997b). Twenty-nine taxa were collected at river mile 164 with caddisflies being the overwhelmingly dominant group; midges were also abundant. Density averaged 14,662 individuals per square meter. Thirty-four taxa were collected at river mile 30 with caddisflies again the overwhelmingly dominant group; midges were present but not as abundant as at river mile 164. Density averaged 16,240 individuals per square meter. Sampling conducted in sand substrate at a nearby bendway without bendway weirs (river mile 20) yielded 7 taxa and 965 individuals per square meter with oligochaete worms being the overwhelmingly dominant group.

The riparian forest within the work area is comprised mostly of small-diameter early successional tree species such as willow, silver maple, and sycamore. The existing riparian forest within the project area is fragmented with low species and structural diversity. The scouring that occurred during the December flood event cleared the majority of the understory vegetation.

Threatened and Endangered Species – U.S. Fish and Wildlife Service provided a list of 7 federally threatened and endangered species that could potentially be found in the area (Alexander County, Illinois) via a letter dated 11 March 2016 and updated 11 July 2016 (Appendix B, *Coordination*). The 7 species, federal protection status, and habitat can be found in Table 5. No critical habitat is located in the work area. See Appendix A, *Biological Assessment*, for more details.

Table 5. Federally listed threatened and endangered species potentially occurring in the work area

Species	**Status**	**Habitat**
Gray bat (*Myotis grisescens*)	Endangered	Caves: feeding – rivers/reservoirs adjacent to forests
Indiana bat (*Myotis sodalis)*	Endangered	Hibernates in caves and mines; maternity & foraging habitat: small stream corridors with well-developed riparian woods; upland & bottomland forests
Northern long-eared bat (*Myotis septentrionalis*	Threatened	Hibernates in caves and mines; swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
Least tern (interior population) (*Sterna antillarum*)	Endangered	Large rivers - nest on bare alluvial and dredge spoil islands
Pallid sturgeon (*Scaphirhynchus albus*)	Endangered	Mississippi and Missouri Rivers
Rabbitsfoot *(Quadrula cylindrica cylindrica)*	Threatened	Ohio River
Sheepnose mussel (*Plethobasus cyphyus*)	Endangered	Shallow areas in larger rivers and streams

3.3 Socioeconomics

Navigation - The Middle Mississippi River is a critically important navigation corridor that provides for movement of a wide variety of commodities of local, national, and international importance. Over 89 million tons of cargo passed through the MMR in 2013, the most recent year with data available (USACE 2013). Food and farm products (24 million tons), coal (17 million tons), crude materials (15 million tons), petroleum products (14 million tons), chemicals and related products (10 million tons), and primary manufactured goods (9 million tons) accounted for the majority (99%) of shipments in 2013.

Demographics and Environmental Justice (Executive Order 12898) - The Dogtooth Bend Phase 6 work area is surrounded by rural land with relatively low population densities. In 2010, Alexander County, Illinois, had a total population size of 8,238 individuals, according to the U.S. Census Bureau's 2010 Demographic Profile, which has likely declined to an estimated 7,492 individuals as of 2014 (http://factfinder.census.gov; Accessed online January 10, 2016). Based on the 2010 Demographic Profile, 50.8 percent were male, 60.9 percent were Caucasian, and 35.4 percent were African American. According to 2014 estimates, the median household income is $25,495, 36.8 percent of the population lives below the poverty level, and the unemployment rate is 8.1 percent.

3.4 Historic and Cultural Resources

Landform History

The project is located on an old scar of the Mississippi River, which has been repeatedly inundated during flood events. The land itself is of predominantly late 19th century origin. On an 1866 chart, the large side channel between old Goose Island and the Illinois riverbank is still active. By 1885, however, it had largely been filled in by sedimentation. The area of the proposed haul road to the north of the project area, however, was still within the Mississippi River. Sometime around the turn of the century, the Corps constructed pile dikes along the Illinois shore, which led to the formation of the current Goose Island. The area, however, continued to be occasionally inundated. Most notably, the 1993 flood essentially re-opened the chute behind the original Island, scouring out the area of the proposed haul road and northern levee armoring.

Previous Archaeological Research

No archaeological sites are known in the meander scar on which the project is located. The nearest known site is approximately 4,300 feet to the northwest on the terrace above the landform. An archaeological survey of Illinois bankline between river mile 32.2L and 34.7L was conducted in 1977 with no finds. The report authors contended that due to the recent river alluvium in this reach there was "little chance of finding signs of aboriginal occupation in the area" (Santeford, 1977, p. 14).

Potential Shipwrecks

During the summer of 1988 when the Mississippi River was at a particularly low level, the St. Louis District Corps of Engineers conducted an aerial survey of exposed wrecks between Saverton, Missouri, and the mouth of the Ohio River. The nearest observed wreck is located at MRM 33.7R, a wooden barge vessel located in a sand bar on the west (right descending, i.e., opposite) bank of the river. The nearest left descending bank (eastern) wrecks are in the Sante Fe Chute a few miles upstream. The river bed in the work area is surveyed at minimum once every two years, with the latest processed survey having been completed in 2014. Further, a bathymetry survey was performed in January 2016 in and around the breached area to detect and record scour depths. The multi-beam (high resolution) surveys detected no topographic anomalies suggesting the presence of unknown wrecks.

In accordance with Section 106 of the National Historic Preservation Act of 1966 and its implementing regulation 36 CFR 800, the District began consultation with the Illinois Historic Preservation Agency with a letter dated 16 March 2016.

Tribal consultation with the 28 federally recognized tribes affiliated with the St. Louis District was initiated with a letter dated 15 June 2016 (Appendix B, *Coordination*).

3.5 Climate Change and Greenhouse Gas Emissions

A large body of scientific evidence indicates that increases in greenhouse gases[2] (GHG) in the Earth's atmosphere are contributing to changes in national and global climatic conditions (Melillo, Richmond, & Yohe, 2014). These changes include such things as increases in average temperature, changes in precipitation patterns, and increases in the frequency and intensity of severe weather events. These changes have the potential to impact a wide sector of the human environment including water resources, agriculture, transportation, human health, energy, and aquatic and terrestrial ecosystems. Therefore, it is important to understand the potential impacts of federal actions on GHG emissions and climate change as well as the potential changes that may occur to the human environment that could affect the assumptions made with respect to determining the impacts and efficacy of the federal action in question.

Accordingly, the Corps is undertaking climate change preparedness and resilience planning and implementation in consultation with internal and external experts using the best available climate science and climate change information. The Corps is preparing concise and broadly-accessible summary reports of the current climate change science with specific attention to USACE missions and operations for the continental United States, Alaska, Hawaii, and Puerto Rico. Each regional report summarizes observed and projected climate and hydrological patterns cited in reputable peer-reviewed literature and authoritative national and regional reports. The following information on climate trends and future climate projections comes from the climate change and hydrology literature synthesis report for the Upper Mississippi River region (USACE, 2015).

Summary of Observed Climate Findings:

*The general consensus in the recent literature points toward moderate increases in temperature and precipitation, and streamflow in the Upper Mississippi Region over the past century. In some studies, and some locations, statistically significant trends have been quantified. In other studies and locales within the Upper Mississippi Region, apparent trends are merely observed graphically but not statistically quantified. There has also been some evidence presented of increased frequency in the occurrence of extreme storm event*s (Villarini, Smith, & Vecchi, 2013). *Lastly, a transition point in climate data trends, where rates of increase changed significantly, was identified by multiple authors at approximately 1970.*

Summary of Future Climate Projection Findings:

There is strong consensus in the literature that air temperatures will increase in the study region, and throughout the country, over the next century. The studies reviewed here generally agree on an increase in mean annual air temperature of approximately 2 to 6 ºC (3.6 to 10.8 ºF) by the latter half of the 21st century in the Upper Mississippi Region. Reasonable consensus is also seen in the literature with respect to projected increases in extreme temperature events, including more frequent, longer, and more intense summer heat waves in the long term future compared to the recent past.

Projections of precipitation found in a majority of the studies forecast an increase in annual precipitation and in the frequency of large storm events. However, there is some evidence presented that the northern

[2] A greenhouse gas is any gas that absorbs infrared radiation in the atmosphere. The major GHGs are carbon dioxide, methane, and nitrous oxide. Less prevalent greenhouse gases include hydrofluorocarbons, perfluorocarbons, and sulphur hexafluoride (UNFCCC 2014).

portion of the Upper Mississippi Region will experience a slight decrease in annual precipitation. Additionally, seasonal deviations from the general projection pattern have been presented, with some studies indicating a potential for drier summers. Lastly, despite projected precipitation increases, droughts are also projected to increase in the basin as a result of increased temperature and ET rates.

A clear consensus is lacking in the hydrologic projection literature. Projections generated by coupling [Global Climate Models] *with macro scale hydrologic models in some cases indicate a reduction in future streamflow but in other cases indicate a potential increase in streamflow. Of the limited number of studies reviewed here, more results point toward the latter than the former, particularly during the critical summer months.*

4. Environmental Consequences

The Environmental Consequences Section of this report details the impacts of the Alternatives on the human environment. The section is organized by resource, in the same order in which they were covered in Section 3, Affected Environment. Within each resource category, impacts will be broken out by alternative. The No Action Alternative consists of not constructing any new levee stabilization, scour hole stabilization, kicker dike, dredging, or grade control structures, but continuing to maintain the existing river training structures and revetment in the vicinity of the work area. The Proposed Action consists of:

- Phase 2:
    - Stabilize the southern and northern ends of levee by establishing a grade that would support rock (A_1 and A_2)
    - Stabilize the perched scour hole (A_3)
    - Establish a stone blanket at the riverside toe of the northern intact levee section (A_4)
    - Construct a kicker dike off the bankline repair (C_1)
    - Dredging for construction access

- Phase 3 (supplemental EA would be prepared to evaluate environmental impacts):
    - Establish a grade control structure (location to be determined) (C_2).

4.1 Physical Resources

Stages

Impacts of the No Action Alternative on Stages – Stages in the work area vicinity and the Middle Mississippi River would be expected to be similar to current conditions under the No Action Alternative. During the high water event from 7-17 January 2016, the Mississippi River was above flood stage at 200,000 cfs. It was estimated that 20% of the total flow from the Mississippi River was cutting across Len Small D&LD. It is expected future high water events would produce a similar outcome, especially if the Ohio River is low and the Mississippi River is high.

Impacts of the Proposed Action on Stages - With implementation of the Proposed Action, stages in the work area vicinity and on the Middle Mississippi River are expected to be similar to current conditions. The proposed work is landside of the bankline; therefore, it is anticipated stages in the work area would be similar to current conditions.

Water Quality

Impacts of the No Action Alternative on Water Quality – Water quality in the vicinity of the work area would likely get worse with formation of a channel cutoff due to increased sedimentation from bankline erosion and head-cutting, and increased potential for agricultural chemicals entering the river system.

Impacts of the Proposed Action on Water Quality – Construction activities are land- and water-based and would cause temporary increases in turbidity and suspended sediment concentrations in the immediate vicinity of the structure locations, dredging locations, and dredge placement sites. The impact would be localized and would dissipate quickly. Sediments in the area are typically sand with little associated fines and would; therefore, not be expected to release contaminants into the water column at concentrations that alone or in combination with other contaminants would cause toxic effects to aquatic organisms.

The proposed kicker dike structure is designed to modify the flow patterns in the area during high water events and could potentially cause minor temporary changes in the suspended sediment concentration in the immediate area. The impact would be localized and would dissipate quickly.

Limestone material used for construction could potentially affect local water chemistry (e.g., alkalinity, hardness, and pH). However, given the prevalence of limestone in the watershed geology and the quick dissipation of any associated fine materials in the water column, the impact is likely to be negligible.

Air Quality

Impacts of the No Action Alternative on Air Quality – Air quality in the vicinity of the work area would be expected to be similar to current conditions. Equipment used for agriculture would generate emissions on an occasional, ongoing basis from the use of petroleum products. With a channel cutoff, navigation could be halted resulting in goods to be transported via rail or truck potentially increasing use of petroleum products. Impacts would be minor and local in nature.

Impacts of the Proposed Action on Air Quality – Air quality in the vicinity of the work area would be expected to be similar to current conditions. Equipment used for construction activities would generate emissions from the use of petroleum products but impacts would be temporary, minor, and local in nature.

Geology and Soils

Impacts of the No Action Alternative on Geology and Soils - Without flooding, land use and soils in the area would remain in agricultural use. With flooding, sedimentation and scour would occur and the risk of losing soils would increase if a channel cutoff forms.

Impacts of Proposed Action on Geology and Soils - Geology and soils in the work area would be expected to be maintained. The Proposed Action would reduce the risk of a channel cutoff. Construction activities may cause temporary disturbance to soils in the vicinity of the structure locations. The impact would be localized and would dissipate quickly.

Prime Farmland

Impacts of the No Action Alternative on Prime Farmland - Prime farmland in the vicinity of the work area is expected to continue to be farmed but would be disrupted by periodic high water events and associated scour and sand deposition. The risk of losing prime farmland would increase if a channel cutoff forms and existing scour hole continues to expand.

Impacts of the Proposed Action on Prime Farmland – Prime farmland in the vicinity of the work area would be expected to be maintained. The Proposed Action would reduce the risk of a channel cutoff. Construction activities may cause temporary disturbances to prime farmland in the vicinity of the structure locations. The impact would be localized and would dissipate quickly.

4.2 Biological Resources

Fish and Wildlife

Impacts of the No Action Alternative on Fish and Wildlife – The fish and wildlife associated with riparian forest, and agricultural habitats in the vicinity of the work area would be expected to be similar to current conditions under the No Action Alternative. During high water events, fauna associated with these habitats would be displaced while fish would have access to a large area of floodplain habitat. The existing scour hole created by the flood would continue to provide off-channel habitat; however, overtime this is expected to fill in naturally from river-borne sand.

Impacts of the Proposed Action on Fish and Wildlife -

The use of revetment and stone blanket to stabilize the bankline, levee ends, and the scour hole may result in permanent burial of benthic invertebrates during construction; however, benthic invertebrates have been shown to inhabit the rocks of wing dikes. Battle et al. (2007) collected fifty taxa from rock substrate with the dominant group being caddisflies. McCain et al. (2005) found that colonization of deployed rock baskets resulted in higher taxa richness, density, and diversity of benthic invertebrates as compared to other substrates sampled. Colonization of the proposed rock structures by benthic invertebrates is anticipated to occur within a year.

Approximately 3.45 acres of riparian forest would be removed for proposed construction activities which include haul roads (appx 2 acres) and rock structures (appx 1.45 acres; Table 6). The majority of the forest is comprised of small diameter silver maple, willow, and sycamore trees providing limited habitat. Some trees would be permanently replaced with rock structure. Natural revegetation after construction would be expected within the proposed work area by stabilizing the area.

Water-based construction would require dredging in an approximate 27-acre area with an estimate of 26,000 cubic yards of material being removed. Dredging is required for construction access to build the southern levee cap (A_1) and kicker dike (C_1). The material would be used to build the foundation of the kicker dike structure (C_1) and be placed in a shallow disturbed area. These locations were selected to minimize impacts to existing deep off-channel aquatic habitat (see Figure 7 above). In addition, dredging would occur in the existing scour hole, which will help extend the life of this deep off-channel habitat; however, it is expected the scour hole would naturally fill-in through time. The sedimentation within the scour hole would not be an immediate response; therefore aquatic organisms are expected to relocate overtime as the conditions change.

With this, short-term temporary impacts to fish and wildlife resources may result, but these impacts are expected to be minor and not likely to adversely affect the fish and wildlife resources in the long-term.

Table 6. Acres required for construction activities

Phase	Feature	Clearing (Acres)	Permanent Access (Acres)	Temporary Access (Acres)
Phase 2	**Haul Road**	2.18	2.28	4.41
	A_2 – Northern Levee Cap	0.23		
	A_4 – Stone Blanket	0.00		
	A_3 – Scour Hole Revetment	0.74	3.00	0.00
	A_1 – Southern Levee Cap	0.30	2.27	0.16
	C_1 - Kicker Dike	0.00	3.54	0.00
	Dredging	0.00	0.00	27.00
	Dredge Spoil Disposal	0.00	0.00	10.16
Phase 3	**C_2 – Grade Control**	TBD	TBD	TBD
	TOTAL	**3.45**	**11.09**	**41.73**

Threatened and Endangered Species

A programmatic (Tier I) consultation (USACE, 1999a), conducted under Section 7 of the Endangered Species Act, considered the systemic impacts of the operation and maintenance of the 9-Foot Channel Navigation Project on the Upper Mississippi River System (including the MMR) and addressed listed species as projected 50 years into the future (USFWS, Biological Opinion for the Operation and Maintenance of the 9-Foot Navigation Channel on the Upper Mississippi River System, 2000). The consultation did not include individual, site specific effects or new construction. It was agreed that site specific impacts and new construction impacts would be handled under separate Tier II consultation. Although channel structure impacts were covered under the Tier I consultation, other site and species specific impacts could occur. As such, the Dogtooth Bend Phase 6 work required Tier II consultation. Accordingly, the District prepared a Tier II Biological Assessment to determine the potential impacts of the work on federally threatened and endangered species (see Appendix A, *Biological Assessment*). USFWS provided a letter dated 8 July 2016 with no objection to the proposed project. Based on the information provided in the BA, the Service concurs with the Corps' impact assessment on the federally listed species and concurs with the FONSI for the proposed project (Appendix B, *Coordination*).

In a letter dated 11 July 2016, Illinois DNR provided a response to the draft EA in regards to state listed species (Appendix B, *Coordination*). In regards to the resources of concern, ILDNR provided the following comments:

- Bumgard Island Illinois Natural Area Inventory Site. This site is not likely to be adversely affected by the proposed project.
- Indiana bat, gray bat, and northern long-eared bat may occur in the project area. IL DNR concurs with the USACE's plan to only clear trees from October 1 through March 31 to avoid impacts to these species.
- IL DNR recommended work to be avoided during the breeding season of the Illinois chorus frog from February 1st through May 31st, in particular the area of the north levee cap. In addition, IL DNR requested further coordination with their Heritage Biologist and arrange a site visit if necessary to discuss project details (Appendix B, *Coordination*). The District will coordinate construction schedule with IL DNR.

- Records of the shrimp crayfish only known to occur at Horseshoe Lake; therefore, impacts to this species are unlikely.

Although the bald eagle was removed from the federal list of threatened and endangered species in 2007, it continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (BGEPA). The BGEPA prohibits unregulated take of bald eagles, including disturbance. The U.S. Fish and Wildlife Service developed the National Bald Eagle Management Guidelines (USFWS, 2007) to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute disturbance. No bald eagle nest trees are known to occur in the immediate vicinity of the work area at this time. If any nest trees are identified in the work area, the National Bald Eagle Management Guidelines would be implemented to minimize potential impacts and appropriate coordination with the U.S. Fish and Wildlife Service would be conducted.

4.3 Socioeconomics

Navigation

Impacts of the No Action Alternative on Navigation - With the No Action Alternative, the degradation of the bankline and associated scour would be expected to continue with high water events potentially accelerating the rate of degradation and increasing the risk of a channel cutoff and inducing head cutting of the channel. If a headcut ensued, then bankline degradation throughout the reach upstream of the cutoff would be at risk of failure (even revetted banks) due to the undermining, and subsequently lead to an increased need for dredging within the reach. Channel incision may undercut existing navigation structures, leading to increase an Operation and Maintenance expenses.

In addition, changes in near-term velocities would likely make the channel unnavigable due to increased energy and decreased safety; and lead to localized areas of high levels of scour, likely requiring additional work to maintain channel stability. The change in energy of the entire reach from the cutoff to the pools would likely reactivate stored sediments throughout the reach, making the navigation channel highly unstable with regard to depth, which would increase dredging requirements and increase the chance of groundings or channel restriction or closures.

A channel cutoff could potentially stop river navigation transport above Cairo, Illinois for an extended period of time by a new shorter, steeper, high velocity channel and resultant channel degradation upstream and downstream. Furthermore, the change in river slope would increase the likelihood the rock at Thebes would come into effect at a higher frequency, additionally restricting or closing traffic.

Impacts of the Proposed Action on Navigation – Implementation of the Proposed Action is expected to reduce the risk of a channel cutoff which is needed to maintain a safe and reliable navigation channel. The majority of the construction work would be land-based and landside of the bankline minimizing any temporary negative effects to navigation during construction.

Demographics and Environmental Justice

Impacts of the No Action Alternative on Demographics and Environmental Justice - With the No Action Alternative, the landowners and agricultural lands would continue to be susceptible to high water events flooding and associated scouring. High water events, enlargement of the scour hole, and the risk of a channel cutoff could potentially impair the ability of landowners to use their land resulting in economic losses and displacement of landowners.

Impacts of the Proposed Action on Demographics and Environmental Justice – Implementation of the Proposed Action is expected to benefit the local agriculture and agri-business economy since agricultural

lands formerly susceptible to the advancing scour hole and potential channel cut-off would now have a reduced risk of additional degradation. The construction activity would also provide short-term employment funded by federal money. The Proposed Action would not disproportionately affect low income or minority populations.

4.4 Historic and Cultural Resources

Impacts of the No Action Alternative on Historic and Cultural Resources – With the No Action Alternative, impacts to known historic and cultural resources within the Middle Mississippi River are anticipated if erosion, headcutting upstream, or channel cutoff continue moving easterly. Any undocumented historic and cultural resources in the floodplain may be affected with future high water events and associated scouring moving easterly. Without high water events, historic and cultural resources in the floodplain would be unlikely affected.

Impacts of the Proposed Action on Historic and Cultural Resources - Given the method of construction (with minimal grading), the extensive disturbance of the area by the levee breach and floodplain scouring, the history of landscape reworking by previous flood events, the late 19th century origin of the much of the landform, and the lack of any survey evidence for extant wrecks, impacts to unknown historic and cultural resources would be unlikely.

Consultation with the Illinois State Historic Preservation Officer (SHPO) has been initiated and would continue. A copy of the correspondence is included in Appendix B, Coordination. If, however, cultural resources were to be encountered during construction, all work would stop in the affected area and further consultation would take place.

The Illinois Historic Preservation Agency provided comments in letters dated 22 April 2016 requesting a survey, and dated 23 June 2016 commenting that no historic properties are affected and have no objection to the undertaking proceeding as planned (Appendix B, *Coordination*).

During tribal consultation, three letters were received (Appendix B, *Coordination*). In an email dated 30 June 2016, the Miami Tribe offered no objection to the proposed project; however if any human remains or Native American cultural items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) or archaeological evidence is discovered during any phase of the project, they request immediate consultation. In a letter dated 23 June 2016, the Quapaw Tribe requested a copy of all SHPO correspondence received for the project, which the District provided. No concerns were expressed. In an email dated 24 June 2016, the Tribal Historic Preservation Office of the United Keetoowah Band of Cherokee Indians in Oklahoma agreed with the report findings that the project would result in a finding of no effect on historic properties; however request the following conditions be followed as the project moves forward, which the District concurs with:

1) Inadvertent Discoveries: Contact THPO to report any finds of human remains, burials, funerary items, sacred objects or objects of cultural patrimony found during project implementation.
2) Post Review Discoveries: In the event of pre-contact artifacts or historic period artifacts are found during project implementation contact the THPO.
3) Activities that have the potential to disturb cultural resources outside the areas specified in the EA/BA are not approved and will not proceed until cultural resources review of potential adverse effects in the new area has been completed.

4.5 Climate Change and Greenhouse Gas Emissions

Impacts of the No Action Alternative on Climate Change and Greenhouse Gas Emissions - With the No Action Alternative, climate change could potentially impact the work area through increased frequency

of high water events related to expected increased precipitation. High water events would increase the risk of a channel cutoff to form. If a channel cutoff were to form, the likelihood of increased greenhouse gas emissions in the future would occur related to increased need of construction to restore a safe and dependable navigation trend.

Impacts of the Proposed Action on Climate Change and Greenhouse Gas Emissions - With respect to impacts on climate change and greenhouse gas emissions, implementation of the Proposed Action would result in some minor greenhouse gas emissions due to equipment used for construction activities, transporting rock, etc. However, the Proposed Action reduces the risk of a channel cutoff which could potentially decrease future greenhouse gas emissions needed to repair and realign the channel to ensure a safe and dependable navigation channel.

5. Cumulative Impacts

Council on Environmental Quality (CEQ) regulations define cumulative impacts as "the impact on the environment which results from the incremental impact of the action 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 taking place over a period of time." (40 CFR §1508.7). In order to assist federal agencies in producing better cumulative impact analyses, CEQ developed a handbook, "Considering Cumulative Effects under the National Environmental Policy Act" (CEQ, 1997). Accordingly, the Dogtooth Bend Phase 6 EA cumulative impact analysis generally followed the steps laid out by the handbook.

Table 7 describes the past, present, and reasonably foreseeable future actions that might also impact each resource category. The cumulative impact analysis evaluates the same resources (Physical Resources [River Stages, Water Quality, Air Quality, and Prime Farmland]; Biological Resources [Fish and Wildlife, Threatened & Endangered Species]; Socioeconomic Resources [Navigation, Demographics & Environmental Justice]; Historic & Cultural Resources, and Climate Change & Greenhouse Gas Emissions) that were evaluated in the Environmental Consequences section. In addition, the cumulative impacts for the No Action Alternative and Action Alternative are described. The analysis looked beyond the footprint of the work area to include impacts to the resources throughout the Middle Mississippi River. Clearly the human environment in the Middle Mississippi River has been, and would continue to be, impacted by a wide range of actions.

The Regulating Works Project, in combination with the other actions throughout the watershed, has had past impacts, both positive and negative, on the human environment. However, this analysis is meant to characterize the incremental impact of the current action in the broader context of other actions affecting the same resources. Although past actions associated with the Regulating Works Project have impacted these resources, the current method of conducting business for the Project includes involving partner agencies throughout the planning process, avoiding and minimizing environmental impacts, and utilizing innovative river training structure configurations to provide fish habitat while still providing benefits to the navigation system. Although our understanding of the actions that bear upon the resources of the Middle Mississippi River continues to evolve, equilibrium in habitat conditions appears to have been reached. Accordingly, only minimal impacts to the resources, ecosystem and human environment are anticipated for the Dogtooth Bend Phase 6 work area.

A cumulative impact analysis was recently conducted for four Environmental Assessments with signed Findings of No Significant Impact for the Regulating Works Project on the MMR (USACE, 2014a) (USACE, 2014b) (USACE, 2014c) (USACE, 2015). A comprehensive analysis of the cumulative impacts of the Upper Mississippi River Navigation Project on the geomorphic and biological resources of the UMR has been

described in WEST (2000) prepared for the Programmatic Environmental Impact Statement for the UMR-IWW System Navigation Feasibility Study (USACE, 2004). These studies provided a cumulative effects analysis of the 9-foot Navigation project for the entire UMR and the MMR. WEST (2000) provided a geomorphic assessment of the cumulative effects on geomorphology, sediment transport, and dredging. WEST (2000) provided a biological assessment of the cumulative effects of geomorphic changes, physical habitat changes, impoundment and river regulation, channel training structures, dredging and material placement, the Upper Mississippi River Restoration Program habitat projects, connectivity of UMRS habitats, changes in the UMRS Basin, changes in UMR floodplain land use and land cover, effects of both point and non-point-source discharges to UMRS, fish entrainment and impingement at electrical generating plants, and exotic and nuisance species. In addition, the UMR-IWW System Navigation Feasibility Study (USACE, 2004) contains a comprehensive description of the environmental impacts of navigation traffic for existing traffic levels and modeled traffic levels for each decade to 2050.

In addition to the above National Environmental Policy Act documents, there currently exists an extensive literature describing the historic, current, and future geomorphic and ecological condition of the UMR, either including or specific to the MMR. The Upper Mississippi River Restoration Program conducted two ecological status and trends analyses of the UMR (USGS, 1999) (Johnson & Hagerty, 2008). The initial Status and Trends Report (USGS, 1999) provided a thorough introduction to the UMRS including extensive descriptions of historical context, watershed geology and land use, floodplain forests, bird populations, water quality, fishes, aquatic vegetation and benthic invertebrates. The 1999 report (USGS, 1999) provided the background information upon which the 2008 report (Johnson & Hagerty, 2008) built. The 2008 Status and Trends Report focused on measuring changes in potential indicators of system health as derived from the Upper Mississippi River Restoration - Long Term Resource Monitoring data. Twenty-four ecosystem indicators were chosen because they relate to many of the primary resource problems or outcomes important to managers. The 24 indicators were grouped into seven categories: hydrology, sedimentation, water quality, land cover, aquatic vegetation, invertebrates, and fish. Each indicator was evaluated for status across locations, including the MMR, and for trends over time, with estimates of uncertainty, when possible. The UMRR Program also conducted a Habitat Needs Assessment for the UMRS (Theiling, et al., 2000). The primary objectives of the Habitat Needs Assessment were the evaluation of existing conditions throughout the UMRS, forecasting future habitat conditions, and quantifying ecologically sustaining and socially desired future habitat conditions. Heitmeyer (2008) provided a detailed description of the historic physical and biological conditions specific to the MMR, changes to those conditions, and restoration and management recommendations.

Pursuant to 40 CFR 1502.21 and CEQ Guidelines, the above documents and analyses are incorporated by reference into this analysis for the purpose of reducing the size of this document and not duplicating applicable analyses. 40 CFR § 1502.21 requires that material incorporated by reference must be "reasonably available for inspection". The documents are available for review at:

http://www.mvs.usace.army.mil/Missions/Navigation/SEIS/Library.aspx

6. Mitigation

Mitigation measures are used to avoid, minimize, or compensate for adverse impacts to environmental resources. The Dogtooth Bend Phase 6 work has avoided and minimized adverse impacts throughout the alternative development process. The final design has minimized changes to existing riparian corridor habitat and placed value on the scour hole as new off-channel aquatic habitat. No adverse impacts have been identified that would require compensatory mitigation due to the existing highly disturbed nature of the proposed work area.

7. Permits

Maintenance of existing flood damaged structures and/or flood damaged fills, which have been previously authorized; repair of uplands damaged by storms, floods, or other discrete events; or emergency reconstruction and repair activities for flood damaged areas may be authorized by existing General Permits under Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act of 1899. The St. Louis District Regulatory Branch has determined that the proposed activities under Phase 2 are authorized under Section 404 of the CWA by an existing Department of Army Nationwide Permit (NWP) No. 3. The activities authorized by this NWP 3 would result in minimal individual and cumulative adverse effects on the aquatic environment. NWP 3 is pre-certified with a Section 401 Water Quality Certification from the Illinois Environmental Protection Agency (IEPA).

The Clean Water Act permit process for activities under Phase 3 (i.e., grade control structure) would be initiated during or just prior to the release of the future Supplemental EA, if Phase 3 is pursued. Phase 3 would be evaluated for compliance with 404(b)(1) Guidelines, including Subparts C through G. All required permits would be acquired prior to initiation of Phase 3 construction including:

- Clean Water Act Section 401 – Section 401 requires the state to set water quality standards including designating water use and pollutant levels. The program is administered by the State of Illinois, which reviews applications to ensure that the proposed project would not degrade water quality. The Section 401 water quality certification review process would begin when the public notice is released.
- Clean Water Act Section 404 – Section 404 regulates the placement of fill, such as rock, in waters of the United States. For activities under Phase 3 (i.e., the grade control structure), a Section 404(b)(1) document would be completed by the Corps for these activities and would be performed at the time of the Supplemental EA.

Section 402 permit is not anticipated for Phase 2 or Phase 3 activities due to areas already being cleared by the flood damage. All permits necessary for completion of the work would be attained prior to implementation.

8. Public Review

The draft EA and unsigned FONSI for the proposed work were made publically available from 10 June to 10 July 2016. Emails and/or letters were provided to the distribution list (Appendix C, *Distribution List)*, and the draft documents were posted on the St. Louis District Corps of Engineers website. Response letters and emails received are provided in Appendix B, *Coordination.* No major objections to the project were received.

Table 7. Cumulative Impacts Analysis by Resource

Resource	Past Actions	Present Actions	Future Actions	No Action Alternative	Proposed Action
Stages	Flows and stages impacted by watershed land use changes, levee construction, mainline and watershed dam construction, consumptive water use, climate change	Continued impacts due to land use changes in watershed, consumptive water use, levee construction, climate change	Continued impacts due to land use changes in watershed, consumptive water use, levee construction, climate change	No impacts on stages anticipated	No impacts on stages anticipated
Water Quality	Increasing human populations and industrialization result in increased water quality problems. Establishment of Clean Water Act, NEPA, USEPA, state environmental agencies and associated regulations greatly improve conditions.	Continued population growth and development result in increased potential for water quality impacts. Continued regulation enforcement and societal recognition prevent water quality degradation	Continued regulation enforcement and societal recognition. Continued population growth and development result in increased potential for water quality impacts	Potential increased sedimentation resulting from channel cutoff and head-cutting; increased agricultural chemicals entering system through runoff	Localized, temporary increase in suspended sediment concentrations during construction activities
Air Quality	Increasing human populations and industrialization result in deterioration of air quality. Establishment of Clean Air Act, NEPA, USEPA, air quality standards improve conditions. Attainment status in work area.	Continued population growth and development result in increased potential for air quality impacts. Continued regulation enforcement and societal recognition. Continued attainment status in work area.	Continued population growth and development result in increased potential for air quality impacts. Continued regulation enforcement and societal recognition. Continued attainment status in work area.	Minor and local impacts due to use of agricultural machinery and navigation in the vicinity	Temporary, minor, local impacts to air quality due to one-time use of construction equipment
Geology, Soils, & Prime Farmland	Increasing human populations and industrialization result in loss of prime farmland and increased pressure on marginal lands	Population growth and development result in increased potential for prime farmland impacts.	Population growth and development result in increased potential for prime farmland impacts	Potential loss of prime farmland due to channel cutoff and scour; increased pressure on marginal lands	Temporary, minor, local impacts to prime farmland due to one-time use of construction equipment
Demographics & Environmental Justice	Rural land with relatively low population densities and relatively high percentage of population living below poverty level	Continued rural land with low population densities	Continued rural land with low population densities	Future high water events would increase risk of channel cutoff forming which could result in displacement of the local population and economic losses. Potential for agri-business economy to be impacted by continued degradation of productive agricultural land	Reduction in risk of channel cutoff forming and displacing the population. Continued rural land able to be farmed
Fish and Wildlife (including threatened and endangered species)	Transformation of river system from natural condition to pooled lock and dam system above Chain of Rocks; in MMR, loss of floodplain habitat due to levees, agriculture, urbanization; loss of natural river habitat – loss of dynamic habitat due to river channel stabilization with dikes/ revetment; loss of side channel habitat; dredging impacts; navigation impacts; USACE, other federal, state, and private habitat restoration and land mgmt programs reverse habitat loss; introduction of exotic species/reduced native species biomass; implementation of innovative river training structures to provide habitat diversity; recognition of T&E species through Endangered Species Act; listing of multiple T&E species in MMR; implementation of District Biological Opinion Program	Maintenance of current habitat conditions due to maintenance of lock and dam system above Chain of Rocks and existing dikes/revetment; continued implementation of Regulating Works Project; continued use of innovative river training structures to provide habitat diversity; habitat restoration and land mgmt through USACE, other federal, state, and private programs; habitat changes associated with recent and current innovative dike construction; maintenance of current floodplain habitat conditions due to continued agriculture use/ maintenance of existing levees/ urbanization; dredging impacts; navigation impacts; native species continue to be impacted by exotic species; continued implementation of Biological Opinion Program; restoration/maintenance of side channel habitat	Continued maintenance of habitat conditions due to maintenance of lock and dam system above Chain of Rocks and maintenance of existing dikes/revetment; dredging impacts; navigation impacts; continued implementation of Regulating Works Project; continued use of innovative river training structures to provide habitat diversity; continued habitat restoration and land mgmt through USACE, other federal, state, and private programs; maintenance of current floodplain habitat conditions due to continued agriculture use/ maintenance of existing levees/ urbanization; new exotic species likely to be introduced; continued implementation of Biological Opinion Program; restoration/maintenance of side channel habitat	Fish and wildlife associated with floodplain forest, wet meadow, and agricultural habitats in the vicinity of the work area expected to be similar to current conditions. During high water events, fauna associated with these habitats would be displaced while fish would have access to a large area of floodplain habitat. With increased likelihood of a channel cutoff forming, a corresponding oxbow lake would develop providing off-channel habitat; however, due to expected headcutting in the main channel, main channel border habitat would be degraded due to increased sedimentation; may affect but not likely to adversely affect threatened and endangered species	Avoidance of sites during construction; increased fish and benthic invertebrate use of structure locations due to increased bathymetric, flow, and substrate diversity; conversion of 4 acres of floodplain forest habitat; may affect but not likely to adversely affect threatened and endangered species anticipated
Historic and Cultural Resources	Historic and cultural resources subjected to natural processes and manmade actions (e.g., erosion, floodplain development); recognition of importance of historic and cultural resources through National Historic Preservation Act (and others)	Historic and cultural resources continue to be impacted by human activities as well as natural processes; continued societal recognition of importance of historic and cultural resources	Historic and cultural resources continue to be impacted by human activities as well as natural processes; continued societal recognition of importance of historic and cultural resources	May affect known and unknown historic and cultural resources	No known historic resources would be affected. Impacts to unknown historic and cultural resources unlikely.
Navigation	1927 River and Harbor Act authorized USACE to provide a 9-foot channel on MMR; USACE transformed free-flowing Mississippi River system into navigable waterway with 37 lock and dam complexes above Chain of Rocks, some dredging, dikes, revetment; growth of port facilities and inland waterways and traffic throughout Mississippi River system provided for movement of commodities with local, national, and international importance	Operation of lock and dam system above Chain of Rocks continues; traditional and innovative stone dike, revetment construction, rock removal, and dredging continue to provide safe and dependable navigation channel; navigation continues to be an important part of local / national / international transportation and commerce activities	Operation of lock and dam system above Chain of Rocks continues; traditional and innovative stone dike, revetment construction, rock removal, and dredging continue to provide safe and dependable navigation channel; navigation continues to be an important part of local / national / international transportation and commerce activities	Increased risk of channel cutoff forming which would result in near-term high velocities making channel unnavigable, lead to localized high levels of scour requiring further action to maintain channel stability. The change in energy of the entire river reach from the cutoff to the pools would likely reactivate stored sediment requiring increased dredging and risk of groundings. A headcut would ensue that would lead to bankline degradation and increase dredging, potentially undercutting navigation structures. The cutoff would change the slope of the channel which could increase frequency of rock at Thebes to be exposed restricting navigation traffic	Reduction in risk of channel cutoff forming and ensures a safe and reliable navigation channel
Climate Change & Greenhouse Gas Emissions	Increasing human populations and industrialization result in increased greenhouse emissions. Establishment of Clean Air Act, NEPA, USEPA, air quality standards improve conditions	Continued population growth and development result in increased potential for increased greenhouse gas emission impacts. Continued regulation enforcement and societal recognition	Continued population growth and development result in increased potential for increased greenhouse gas emission impacts. Continued regulation enforcement and societal recognition. Increased precipitation and frequency of high water events	Increased risk of channel cutoff forming through increased frequency of high water events related to expected increased precipitation. Increase in local greenhouse gas emissions may result due to construction activities needed to restore the channel	Minor greenhouse gas emissions due to equipment used for construction activities, transporting rock, etc. Reducing the risk of a channel cutoff could potentially decrease future greenhouse gas emissions needed to repair and realign the channel if a cutoff forms.

9. Relationship of Proposed Action to Environmental Requirements

Table 8. Federal policy compliance status

Federal Laws[1]	Compliance Status
Abandoned Shipwreck Act of 1987, as amended, 43 USC § 2101, et seq.	Full
American Indian Religious Freedom Act, as amended, 42 USC § 1996	Full
Archaeological and Historic Preservation Act, as amended, 54 USC § 312501, et seq.	Full
Bald and Golden Eagle Protection Act, as amended, 16 USC § 668, et seq.	Full
Clean Air Act, as amended, 42 USC § 7401, et seq.	Full
Clean Water Act, as amended, 33 USC § 1251, et seq.	Partial[2]
Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 USC § 9601, et seq.	Full
Endangered Species Act, as amended, 16 USC § 1531, et seq.	Full
Farmland Protection Policy Act, as amended, 7 USC § 4201, et seq.	Full
Federal Water Project Recreation Act, as amended, 16 USC §460l-12, et seq. and 16 USC § 662	Full
Fish and Wildlife Coordination Act, as amended, 16 USC § 661, et seq.	Full[3]
Flood Control Act of 1944, as amended, 16 USC § 460d, et seq. and 33 USC § 701, et seq.	Full
Food Security Act of 1985, as amended, 16 USC § 3801, et seq.	Full
Land and Water Conservation Fund Act of 1965, as amended, 16 USC § 460l-4, et seq.	Full
Migratory Bird Treaty Act of 1918, as amended, 16 USC § 703, et seq.	Full
National Environmental Policy Act, as amended, 42 USC § 4321, et seq.	Partial[3]
National Historic Preservation Act, as amended, 54 USC § 300101, et seq.	Full
National Trails System Act, as amended, 16 USC § 1241, et seq.	Full
Noise Control Act of 1972, as amended, 42 USC § 4901, et seq.	Full
Resource Conservation and Recovery Act, as amended, 42 USC § 6901, et seq.	Full
Rivers and Harbors Appropriation Act of 1899, as amended, 33 USC § 401, et seq.	Partial[2]
Wilderness Act, as amended, 16 USC § 1131, et seq.	Full
Executive Orders[4]	
Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, EO 12898, February 11, 1994, as amended	Full
Floodplain Management, EO 11988, May 24, 1977, as amended	Full
Invasive Species, EO 13112, February 3, 1999, as amended	Full
Protection and Enhancement of Environmental Quality, EO 11991, May 24, 1977	Full
Protection and Enhancement of the Cultural Environment, EO 11593, May 13, 1971	Full
Protection of Wetlands, EO 11990, May 24, 1977, as amended	Full
Recreational Fisheries, EO 12962, June 7, 1995, as amended	Full
Responsibilities of Federal Agencies to Protect Migratory Birds, EO 13186, January 10, 2001	Full
Trails for America in the 21st Century, EO 13195, January 18, 2001	Full

[1] Also included for compliance are all regulations associated with the referenced laws. All guidance associated with the referenced laws were considered. Further, all applicable Corps of Engineers laws, regulations, policies, and guidance have been complied with but not listed fully here.

[2] Required permits, coordination would be sought during document review.

[3] Full compliance after submission for public comment and signing of FONSI.

[4] This list of Executive Orders is not exhaustive and other Executive Orders not listed may be applicable.

10. List of Preparers

Table 9. List of Report Preparers, including their role and level of experience

Name	Role	Experience
Mike Rodgers, P.E.	Project Manager	14 years, hydraulic engineering
Tim Lauth	Engineering Lead	6.5 years, hydraulic engineering
Kat McCain, Ph.D.	Environmental Lead	8 years, biology, report writer
Kevin Slattery	HTRW	17 years, environmental science
Chris Koenig, M.A., RPA	Historical and Cultural Resources	14 years, archaeology and historic preservation
Danny McClendon	Regulatory	29 years, regulatory compliance; biology
Keli Broadstock	Legal review	4 years USACE, 6 years private sector law

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REGULATING WORKS PROJECT, DOGTOOTH BEND PHASE 6
RM 34-33 LEFT DESCENDING BANK
ON THE MIDDLE MISSISSIPPI RIVER
ALEXANDER COUNTY, ILLINOIS

FINDING OF NO SIGNIFICANT IMPACT

1. In accordance with the National Environmental Policy Act, I have reviewed and evaluated the documents concerning the Regulating Works Project Dogtooth Bend Phase 6, Alexander County, Illinois. As part of this evaluation, I have considered:

    a. Existing resources and the No Action Alternative.

    b. Impacts to existing resources from the Proposed Action.

2. The possible consequences of these alternatives have been studied for physical, environmental, cultural, social and economic effects, and engineering feasibility. My evaluation of significant factors has contributed to my finding:

    a. The work substantially reduces the risk of a channel cutoff. This would be accomplished through stabilizing levee ends, stabilizing the perched scour hole, constructing a kicker dike, and the future establishment of a grade control structure.

    b. No adverse impacts to federally threatened or endangered species are anticipated.

    c. No significant impacts are anticipated to natural resources, including fish and wildlife resources. The proposed work would have no effect upon significant known historic properties or archaeological resources. There would be no appreciable degradation to the physical environment (e.g., stages, air quality, and water quality) due to the work.

    d. The No Action Alternative was evaluated and determined to be unacceptable.

3. Based on the evaluation and disclosure of impacts contained within the Environmental Assessment, I find no significant impacts to the human environment are likely to occur as a result of the proposed action. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with the proposed Regulating Works Project Dogtooth Bend Phase 6, Alexander County, Illinois.

_____ (Date)

_____
ANTHONY P. MITCHELL
COL, EN
Commanding

REGULATING WORKS PROJECT, DOGTOOTH BEND PHASE 6
RM 34-33 LEFT DESCENDING BANK
ON THE MIDDLE MISSISSIPPI RIVER
ALEXANDER COUNTY, ILLINOIS

FINDING OF NO SIGNIFICANT IMPACT

1. In accordance with the National Environmental Policy Act, I have reviewed and evaluated the documents concerning the Regulating Works Project Dogtooth Bend Phase 6, Alexander County, Illinois. As part of this evaluation, I have considered:

    a. Existing resources and the No Action Alternative.

    b. Impacts to existing resources from the Proposed Action.

2. The possible consequences of these alternatives have been studied for physical, environmental, cultural, social and economic effects, and engineering feasibility. My evaluation of significant factors has contributed to my finding:

    a. The work substantially reduces the risk of a channel cutoff. This would be accomplished through stabilizing levee ends, stabilizing the perched scour hole, constructing a kicker dike, and the future establishment of a grade control structure.

    b. No adverse impacts to federally threatened or endangered species are anticipated.

    c. No significant impacts are anticipated to natural resources, including fish and wildlife resources. The proposed work would have no effect upon significant known historic properties or archaeological resources. There would be no appreciable degradation to the physical environment (e.g., stages, air quality, and water quality) due to the work.

    d. The No Action Alternative was evaluated and determined to be unacceptable.

3. Based on the evaluation and disclosure of impacts contained within the Environmental Assessment, I find no significant impacts to the human environment are likely to occur as a result of the proposed action. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with the proposed Regulating Works Project Dogtooth Bend Phase 6, Alexander County, Illinois.

20 July 2016
(Date)

ANTHONY P. MITCHELL
COL, EN
Commanding

Appendix A

TIER II BIOLOGICAL ASSESSMENT

REGULATING WORKS PROJECT

DOGTOOTH BEND

PHASE 6

RM 34-33

ALEXANDER COUNTY, ILLINOIS

ON THE

MIDDLE MISSISSIPPI RIVER SYSTEM

REGIONAL PLANNING AND ENVIRONMENTAL DIVISION (CEMVP-PD-P)

U.S. ARMY CORPS OF ENGINEERS

1222 SPRUCE STREET

ST. LOUIS, MO 63103

JULY 2016

1. Programmatic Endangered Species Compliance

A programmatic (Tier I) consultation (USACE, Tier I of a Two Tiered Biological Assessment. Operation and Maintenance of the Upper Mississippi River Navigation Project within St. Paul, Rock Island, and St. Louis Districts., 1999a), conducted under Section 7 of the Endangered Species Act, considered the systemic impacts of the operation and maintenance of the 9-Foot Channel Navigation Project on the Upper Mississippi River System and addressed the listed species as projected 50 years into the future (USFWS, 2000). The consultation did not include individual, site-specific project effects or new construction. It was agreed that site-specific project impacts and new construction impacts would be handled under separate Tier II consultation. Although channel structure impacts were covered under the Tier I consultation, other site- and species-specific impacts may occur. As such, the Dogtooth Bend Phase 6 project requires a Tier II consultation.

2. Project Authority

The Congress of the United States, through a series of Rivers and Harbors Acts beginning in 1824, authorized the U.S. Army Corps of Engineers to provide a safe and dependable navigation channel on the Middle Mississippi River (MMR), that portion of the Mississippi River between the confluences of the Ohio River and the Missouri River. The most recent authorization stipulates a channel that is 9 feet deep and not less than 300 feet wide, with additional width in bends as required. The ongoing project to maintain navigation on this stretch of river is also commonly referred to as the 'Regulating Works Project'. The long-term goal of the Regulating Works Project, as authorized by Congress, is to provide a sustainable and safe navigation channel and reduce federal expenditures by alleviating the amount of annual maintenance dredging and the occurrence of vessel accidents through the construction component of regulating works. Due to the number of sharp bends in the MMR, the St. Louis District continually monitors severe bank erosion areas that could potentially result in a navigation channel cutoff and takes appropriate action to prevent this potentially catastrophic event from happening.

3. Project Need

During the high water event of late December 2015-early January 2016, the Len Small levee near Miller City, Illinois sustained significant damage, most notably a nearly mile-long levee breach with associated floodplain scouring, which also included a failure of the adjacent Mississippi River bankline. The bankline was repaired in February 2016; however, the levee breach and associated scour have not been repaired and the threat of a channel cutoff exists. There is imminent need to pursue federal action under the Regulating Works Project, which is intended to ensure the stability of the navigation channel. Site conditions are highly undesirable and threatening the stability of the navigation channel. These undesirable conditions include (1) unstable bankline; (2) advancing scour hole; and (3) high risk of a channel cutoff forming. The Proposed Action consists of construction of the following structures (Table 1) in order to attain the desired conditions:

Table 1. Proposed Actions and Purpose

Task	Activity	Work to be Completed	Purpose	Stone Quantities
Phase 2	A_1	Stabilize southern levee end by establishing a grade that would support rock placement, and then armoring the levee ends	To reduce potential risk of channel cutoff and to prevent further degradation from additional high water	10,400 TN
	A_2	Stabilize northern levee end by establishing a grade that would support rock placement, and then armoring the levee ends	To reduce potential risk of channel cutoff and to prevent further degradation from additional high water	6,500 TN
	A_3	Stabilize the perched scour hole north of the bankline breach along the bank by armoring the hole's bank adjacent to the river bank	To reduce potential risk of channel cutoff	6,500 TN
	A_4	Establish a stone blanket at the riverside toe of the northern intact levee section from the levee end back approximately 300 feet to the 1993 repair	To reduce potential risk of channel cutoff	6,500 TN
	C_1	Construct a kicker dike off of the bankline repair of Phase 1	To reduce potential risk of channel and act as a false bankline.	72,800 TN
Phase 3	C_2	Establish grade control structure if Len Small levee not restored	To reduce potential risk of channel cutoff	TBD

4. Species Covered in this Consultation:

U.S. Fish and Wildlife Service provided a list of 7 federally threatened and endangered species that could potentially be found in the area (Alexander County, Illinois) via a letter dated 11 March 2016 and updated 11 July 2016 (See Appendix B, *Coordination*). The 7 species, federal protection status, and habitat can be found in Table 2. No critical habitat is located in the work area.

Table 2. Federally listed threatened and endangered species potentially occurring in the work area

Species	**Status**	**Habitat**
Gray bat (*Myotis grisescens*)	Endangered	Caves: feeding – rivers/reservoirs adjacent to forests
Indiana bat (*Myotis sodalis)*	Endangered	Hibernates in caves and mines. Maternity and foraging habitat: small stream corridors with well-developed riparian woods; upland and bottomland forests
Northern long-eared bat (*Myotis septentrionalis*	Threatened	Hibernates in caves and mines; swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
Least tern (interior population) (*Sterna antillarum*)	Endangered	Large rivers - nest on bare alluvial and dredge spoil islands
Pallid sturgeon (*Scaphirhynchus albus*)	Endangered	Mississippi and Missouri Rivers
Rabbitsfoot *(Quadrula cylindrica)*	Threatened	Ohio River
Sheepnose mussel (*Plethobasus cyphyus*)	Endangered	Shallow areas in larger rivers and streams

5. Impact Assessment

Gray Bat (*Myotis grisescens*) – The gray bat is listed as endangered and occurs in several Illinois and Missouri counties where it inhabits caves both summer and winter. This species forages over rivers and reservoirs adjacent to forests. No caves would be impacted by the Proposed Action; therefore, this action would have "*no effect*" on the gray bat.

Indiana Bat (*Myotis sodalis)* – The range of the Indiana bat includes much of the eastern half of the United States, including Illinois. Indiana bats migrate seasonally between winter hibernacula and summer roosting habitats. Winter hibernacula include caves and abandoned mines. Females emerge from hibernation in late March or early April to migrate to summer roosts. During the summer, the Indiana bat frequents the corridors of small streams with well-developed riparian woods, as well as mature upland forests. It forages for insects along stream corridors, within the canopy of floodplain and upland forest, over clearings with early successional vegetation (old fields), along the borders of croplands, along wooded fencerows, and over farm ponds in pastures. Females form nursery colonies under the loose bark of trees (dead or alive) and/or cavities, where each female gives birth to a single young in June or July. A maternity colony may include from one to 100 individuals. A single colony may utilize a number of roost trees during the summer, typically a primary roost tree and several alternates. Some males remain in the area near the winter hibernacula during summer months, but others disperse throughout the range of the species and roost individually or in small numbers in the same types of trees as females.

Disturbance and vandalism, improper cave gates and structures, natural hazards, such as flooding or freezing, microclimate changes, land use changes in maternity range, and chemical contamination are the leading causes of population decline in the Indiana bat (USFWS, 2000) (USFWS, 2004). To avoid impacting this species, tree clearing activities should not occur during the period of 1 April to 30 September.

The Proposed Action is anticipated to be primarily performed by land-based equipment in areas that have been recently cleared naturally by the high water event of December 2015. The construction of a haul road may require approximately 2 acres of small diameter trees and woody debris be removed to provide land-based construction access to haul rock (Photo 1). And an additional 1.45

Photo 1. Locations of proposed haul road on north end of levee end

acres of tree removal is required to build the rock structures. The Proposed Action may result in the removal of small diameter silver maple, willow and sycamore trees, which are unsuitable bat tree habitat. To avoid impacts to bats, tree clearing activities would occur during the period of 1 October to 31 March; and construction is scheduled in the winter months when Indiana bats are not present. Thus, Dogtooth Bend Phase 6 "may affect but is not likely to adversely affect" the Indiana Bat.

Northern long-eared bat (*Myotis septentrionalis*) **-** The northern long-eared bat was recently declared a federally threatened species throughout its range (Federal Register 4 May 2015). The northern long-eared bat is sparsely found across much of the eastern and north central United States and spends winter hibernating in caves and mines. They typically use large caves or mines with large passages and entrances; constant temperatures; and high humidity with no air currents. Within hibernacula, they are found in small crevices or cracks (USFWS, 2015). During summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places, like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. They have also been found, rarely, roosting in structures like barns and sheds (USFWS, 2015). Foraging occurs in floodplain and upland forests. Forest fragmentation, logging and forest conversion are major threats to the species. One of the primary threats to the northern long-eared bat is the fungal disease, whitenose syndrome, which has killed an estimated 5.5 million cave-hibernating bats in the Northeast, Southeast, Midwest and Canada. Suitable northern long-eared bat summer habitat may occur in the forested areas adjacent to the work area. The construction of a temporary haul road may require approximately 2 acres of small diameter trees and woody debris be removed to provide land-based construction access to haul rock (Photo 1). And an additional 1.45 acres of tree removal is required to build the rock structures. The Proposed Action may result in the removal of small diameter silver maple, willow and sycamore trees, which are unsuitable bat tree habitat. To avoid impacts to bats, tree clearing activities would occur during the period of 1 October to 31 March; and construction is scheduled in the winter months when northern long-eared bats are not present. Thus, Dogtooth Bend Phase 6 "*may affect but is not likely to adversely affect*" the northern long-eared bat.

Least Tern (*Sterna antillarum*) – The federally endangered least tern is a colonial, migratory waterbird which resides and breeds along the Mississippi River during the spring and summer. Least terns arrive on the Mississippi River from late April to mid-May. Reproduction takes place from May through August, and the birds migrate to the wintering grounds in late August or early September (USACE, 1999b). Sparsely vegetated portions of sandbars and islands are typical breeding, nesting, rearing, loafing, and roosting sites for least terns along the MMR. Nests are often at higher elevations and well removed from the water's edge, a reflection of the fact that nesting starts when river stages are relatively high (USACE, 1999b). In alluvial rivers, sandbars are dynamic channel bedforms. Individual sandbars typically wax and wane over time as fluvial processes and the construction of river engineering works adjust channel geometry according to varying sediment load and discharge. There is limited data on site fidelity for Mississippi River least terns. Given the highly dynamic bed and planform of the historic river, ability to return to previously used colony sites is not likely a critical life history requirement. The availability of sandbar habitat to least terns for breeding, nesting, and rearing of chicks from 15 May to 31 August is a key variable in the population ecology of this water bird. Only portions of sandbars that are not densely covered by woody vegetation and that are exposed during the 15 May to 31 August period are potentially available to least terns (USACE, 1999b). The size of nesting areas and the number of nests within a colony depend on water levels and the extent of associated sandbars (Sidle & Harrison, 1990). Sandbars have a greater possibility of colonization by least terns if river levels remain low during the breeding season. Smith and Renken (1991) found that sites were more likely to be used by interior least terns in the Mississippi River Valley adjacent to Missouri if sites

were continuously exposed for at least 100 days during the breeding season. A 1999 report (USACE, 1999b) estimated that there were approximately 20,412 acres of non-vegetated sandbar habitat above the MMR low water reference plane (LWRP). About 4,975 acres (111 ac/RM) were located between the Mouth of the Ohio and Thebes Gap (RM 0-45) and 15,437 acres (103 ac/RM) between Thebes Gap and the Mouth of the Missouri River (RM 45-195). Currently, reoccurring nesting is known at Marquette Island (RM 50.5), Bumgard Island (RM 30), and Brown's Bar (RM 24.5-23.5) (Jones, 2009) (USFWS, 2004). Some nesting attempts have also been made at Ellis Island (RM 202); however, these are not considered to be reoccurring. While the Mississippi River appears to have a large amount of sandbar habitat, much of this habitat is not likely available to least terns for nesting and may not be located near suitable foraging habitats (USFWS, 2009a) .

Least terns are almost exclusively piscivorous (Anderson, 1983), preying on small fish, primarily minnows (Cyprinidae). Prey size appears to be a more important factor determining dietary composition than preference for a particular species or group of fishes (Moseley, 1976) (Whitman, 1988) (USACE, 1999b). Fishing occurs close to the nesting colonies and may occur in both shallow and deep water, in main stem river habitats or backwater lakes or overflow areas. Radiotelemetry studies have shown that terns will travel up to 2.5 miles to fish (Sidle & Harrison, 1990) (USACE, 1999b). Along the Mississippi River, individuals are commonly observed hovering and diving for fish over current divergences (boils) in the main channel, in areas of turbulence and eddies along natural and revetted banks, and at "run outs" from floodplain lakes where forage fish may be concentrated (USACE, 1999b).

The Proposed Action work area has been subject to floodplain scour and deposition during high water events. The floodplain has high sand deposition, which could be potentially used for least tern nesting. Currently, there is no known use of the Proposed Action work area by least tern. To avoid and minimize impacts to the least tern, construction would occur in the winter months; therefore the Dogtooth Bend Phase 6 "*may affect but is not likely to adversely affect*" least tern.

Pallid Sturgeon (*Scaphirhynchus albus*) – The estimated population of pallid sturgeon in the MMR ranges between 1600 and 4900 individuals (Garvey, et al., 2009). Pallid sturgeon are very rare relative to shovelnose sturgeon in the MMR (a 1:82 ratio), whereas at Baton Rouge, Louisiana the ratio is 1:6. Threats to population recovery of pallid sturgeon include limited rearing and nursery habitat and loss of mature female adults. Apparent non-reproductive pallid habitat includes wing dikes with sandy substrate, and areas with contrasting flow velocities, complexes of island point bars, and side channels. During low water as in late summer, pallids are found more in the main channel. Reproductive habitat includes the Chain of Rocks area, known gravel bars in the MMR, tributary confluences and side channels (Garvey, et al., 2009).

According to Garvey et al. (2009), adult pallid habitat for foraging and holding station in flow in the MMR is adequate and related primarily to the wing dike areas, although all habitats have been occupied. Hypothetically, some wing dikes may mimic natural depositional areas adjacent to the main channel (e.g., upstream island tips within the main channel). These areas provide an ecotone between flow with deposition and cause an accumulation of insects and small insectivorous fish that facilitate foraging, growth and ultimately reproductive condition. The availability and quality of reproductive habitat for spawning and production of offspring in the MMR is unknown (Garvey, et al., 2009). If adult pallid sturgeon densities increase, wing dikes creating preferred habitat will likely become limited and habitat restoration that creates needed main-channel conditions should be a priority (Garvey, et al., 2009).

It is the position of the U.S. Fish and Wildlife Service (2000) that over time, channel training structures have adversely affected pallid sturgeon by altering the quality and quantity of habitats in the MMR to which the species is adapted (e.g., braided channels, irregular flow patterns, flood cycles, extensive microhabitat diversity, and turbid waters). According to the Service, this loss of habitat has reduced

pallid sturgeon reproduction, growth, and survival by (1) decreasing the availability of spawning habitat; (2) reducing larval and juvenile pallid sturgeon rearing habitat; (3) reducing the availability of seasonal refugia, and (4) reducing the availability of foraging habitat (USFWS, 2000). The Service also asserts that these habitat changes have reduced the natural forage base of the pallid sturgeon, and is another likely contributing factor in its decline (Mayden & Kuhajda, 1997) (USFWS, 2000). The Service states that channel training structures have also altered the natural hydrograph of the MMR by contributing to higher water surface elevations at lower discharges than in the past and to a downward trend in annual minimum stages (Simons, Schumm, & Stevens, 1974) (Wlosinkski, 1999) (USFWS, 2000). According to the Service, this has potentially reduced the availability of pallid sturgeon spawning habitat through the loss of habitat complexity (USFWS, 2000).

The Proposed Action for Dogtooth Bend Phase 6 is primarily land-based and construction activities and dredging occur within the landward side of the bankline. Base on the location of the proposed work on the landward side of the bankline, and proposed construction would occur during the winter months, it is unlikely that pallid sturgeon would be present. Construction activities may result in short-term, temporary adverse effects for pallid sturgeon limited to any individuals within work area during construction; however, these adverse effects are expected to occur at a localized scale and dissipate quickly after construction is complete. Therefore the Dogtooth Bend Phase 6 "*may affect but is not likely to adversely affect*" pallid sturgeon.

Sheepnose mussel (*Plethobasus cyphyus*) – The sheepnose is listed as a federally endangered species and occurs in the Meramec and Bourbeuse rivers in Missouri (USFWS, 2012a). Sheepnose mussels live in larger rivers and streams where they are usually found in shallow areas with moderate to swift currents that flow over coarse sand and gravel. However, they have also been found in areas of mud, cobble and boulders, and in large rivers they may be found in deep runs (USFWS, 2012a).

Historically, the sheepnose occurred in the Mississippi, Ohio, Cumberland, and Tennessee River systems and their tributaries, totaling at least 76 streams, in portions of 14 States (including Illinois and Missouri).

Extant populations of the sheepnose are known from 25 rivers in all 14 States of historical occurrence. In the mainstem of the Upper Mississippi River, sheepnose populations are declining. Despite the discovery of a juvenile in Mississippi River Pool 7 in 2001, recruitment is limited at best. The mainstem population comprises a few old individuals spread across a very large geographic range (pools 4, 5, 7, 11, 14, 15, 16, 17, 20 and 24) in very low numbers (USFWS, 2012a).

The Meramec River flows into the Mississippi River downstream of St. Louis and drains east-central Missouri. The Meramec sheepnose population is stable and recruiting, and represents one of the best range wide. However, the extent of the population in the lower end appears to be shrinking upriver (USFWS, 2012a).

The Bourbeuse River sheepnose population is distributed in the downstream 90 river miles of the river, but is considered rare. Although recruitment has been documented in the Bourbeuse River, the sheepnose population is considered declining (USFWS, 2012a).

This species is not currently found in the mainstem MMR; therefore, the Proposed Action for Dogtooth Bend Phase 6 would have "*no effect*" on the sheepnose mussel.

Rabbitsfoot (*Quadrula cylindrica cylindrica*) – The rabbitsfoot is listed as federally threatened (USFWS, 2009b). It is primarily an inhabitant of small to medium sized streams and some larger rivers. It usually occurs in shallow water areas along the bank and adjacent runs and shoals with reduced water velocity and in moderately compacted gravel and sand substrate. It has also been documented in mixed cobble

and gravel substrate. It feeds on the bottom of a stream, lake, or pond but rarely burrows into the substrate. In small streams, this species is associated with bars or gravel and cobble near fast current, and it has also been found in eddies along the periphery of midstream currents. Spawning occurs between May and July. Threats include siltation, drainage, pollution, zebra mussels, impoundments, livestock, and poor water quality. This species is not known historically to occur in the Mississippi River (USFWS, 2012b); therefore, this action would have "*no effect*" on the rabbitsfoot mussel.

Bald Eagle (*Haliaeetus leucocephalus)* – Although the bald eagle was removed from the federal list of threatened and endangered species in 2007, it continues to be protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act (BGEPA). The BGEPA prohibits unregulated take of bald eagles, including disturbance. The U.S. Fish and Wildlife Service's National Bald Eagle Management Guidelines (USFWS, 2007) provide landowners, land managers, and others with information and recommendations regarding how to minimize potential project impacts to bald eagles, particularly where such impacts may constitute disturbance. No bald eagles are known to nest within 660 feet of the work area; therefore, the action would not affect the bald eagle. However, to minimize impacts to bald eagles, the USFWS guidelines would be adhered to during construction if any nests are observed.

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Appendix B

COORDINATION

REGULATING WORKS PROJECT

DOGTOOTH BEND

PHASE 6

RM 34-33

ALEXANDER COUNTY, ILLINOIS

ON THE

MIDDLE MISSISSIPPI RIVER SYSTEM

REGIONAL PLANNING AND ENVIRONMENTAL DIVISION (CEMVP-PD-P)

U.S. ARMY CORPS OF ENGINEERS

1222 SPRUCE STREET

ST. LOUIS, MO 63103

JULY 2016

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

REPLY TO
ATTENTION OF:

March 16, 2016

Engineering and Construction Division
Curation and Archives Analysis Branch

Ms. Rachel Leibowitz
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
Old State Capitol
Springfield, Illinois 62701

SUBJECT: Emergency Levee Flood Damage Repairs, Len Small Levee, Alexander County, Illinois.

Dear Ms. Leibowitz:

We are contacting you to inform you of emergency repairs made to the Len Small levee system, Alexander County, Illinois, in accordance with Section 106 of the National Historic Preservation Act of 1966, as amended. The Saint Louis District, U.S. Army Corps of Engineers will be providing assistance to the Len Small Drainage and Levee District to make further repairs to damage that took place during December 2015. High water breached the levee in the following location: Township 16S, Range 2W, Sections 30 & 31. The breach was approximately one mile in length.

The enclosed images provide an aerial view of the levee breach and associated flooding (Enclosure 1). Enclosure 2 provides a color enhanced image of the scouring resulting from the flood water velocity. The flow through the breach was approximately 200,000 cubic feet per second, which is approximately five times the normal flow through the main channel. Enclosure 3 represents our greatest concern. Scouring from the breach had the potential to create a new channel across Dogtooth Bend, which would disrupt river navigation for an indefinite period of time.

Due to the urgent situation created by the breach, the St. Louis District took steps to stabilize the river bank at the breach to prevent continued scouring and potential channel diversion. Rock rip-rap was dumped into the breach to prevent further erosion of the edges of the breach and to reduce flow into the breach to a minimally acceptable value.

A review of records of historical shipwrecks did not indicate the presence of any shipwrecks at the location of the breach. The St. Louis District will be making further repairs to the levee system to return the levee to its authorized level of protection. As

SUBJECT: Emergency Levee Flood Damage Repairs, Len Small Levee, Alexander County, Illinois.

repair plans are formalized, we will be contacting you regarding any potential impacts to cultural resources for each levee district.

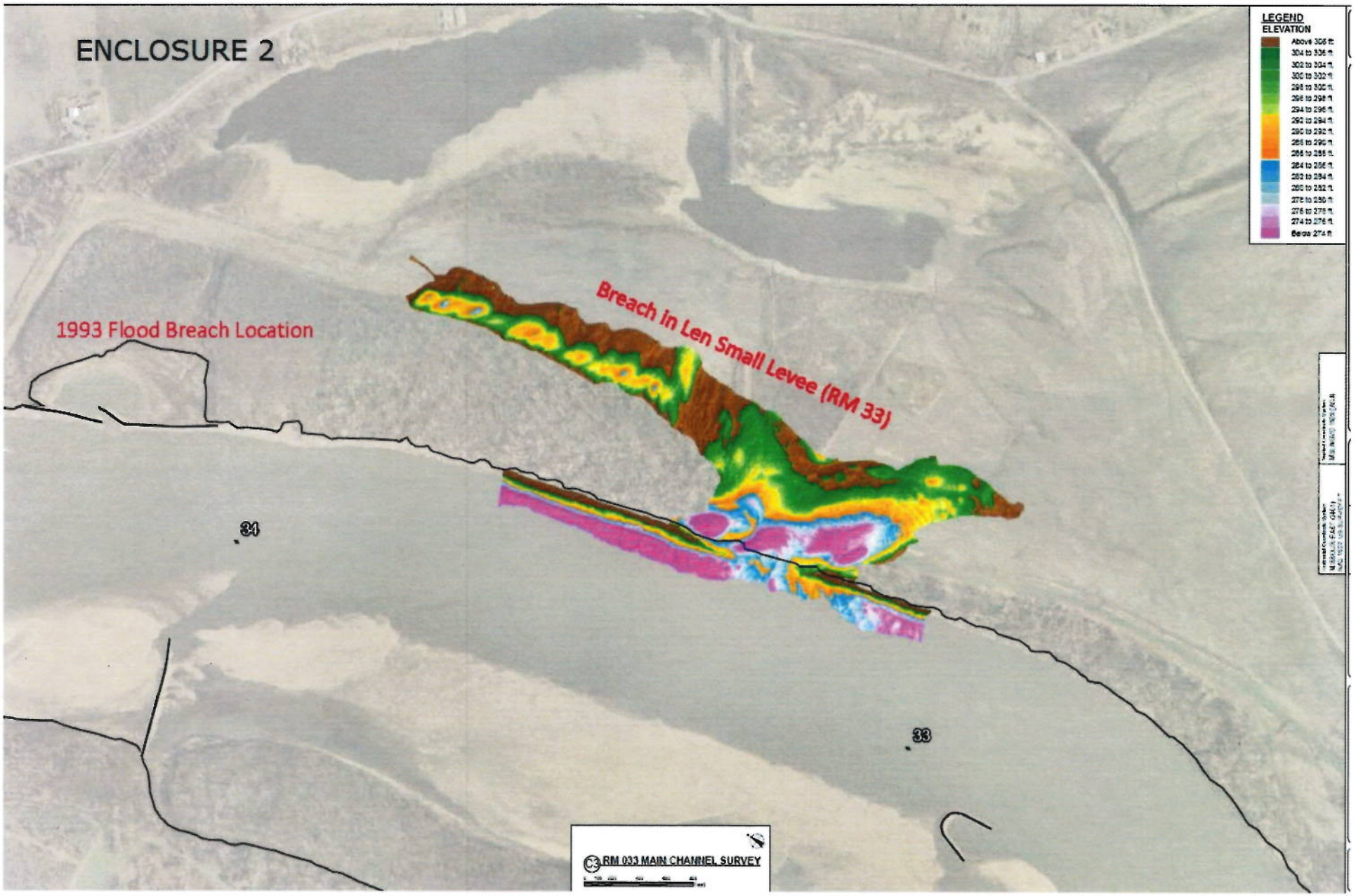
If you have any questions or comments, please feel free to contact me at (314) 331-8466, or Jim Barnes at (314) 331-8830, or e-mail at james.e.barnes@usace.army.mil.

Sincerely,

Michael K. Trimble, Ph.D.
Chief, Curation and Archives
Analysis Branch

Enclosures


Imagery from 05Jan2016
ENCLOSURE 1
Breach in Len Small Levee (RM 33)


ENCLOSURE 2
LEGEND
ELEVATION
Above 306 ft
304 to 306 ft
302 to 304 ft
300 to 302 ft
298 to 300 ft
296 to 298 ft
294 to 296 ft
292 to 294 ft
290 to 292 ft
288 to 290 ft
286 to 288 ft
284 to 286 ft
282 to 284 ft
280 to 282 ft
278 to 280 ft
276 to 278 ft
274 to 276 ft
Below 274 ft
1993 Flood Breach Location
Breach in Len Small Levee (RM 33)
34
33
RM 033 MAIN CHANNEL SURVEY


ENCLOSURE 3
FLOW
Potential for a Channel Cutoff
(17 miles reduced to 3.5 miles)
Google earth

Illinois Historic
Preservation Agency

1 Old State Capitol Plaza, Springfield, IL 62701-1512

FAX 217/524-7525
www.illinoishistory.gov

SURVEY REQUEST

Alexander County
Miller City
Santa Fe Road, Miller City Road, Watson Road, Levee Road
Section:30-Township:16S-Range:2W, Section:31-Township:16S-Range:2W
COESTL
Emergency Levee Repairs - Len Small Levee

PLEASE REFER TO: IHPA LOG #001032216

April 22, 2016

Michael K. Trimble, Ph.D., Chief
Department of the Army, St. Louis District, Corps of Engineers
Curation and Archives Analysis Branch (EC-Z)
1222 Spruce St.
St. Louis, MO 63103-2833

Dear Chief Trimble:

Thank you for requesting comments from our office concerning the possible effects of the project referenced above on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966 (16 USC 470), as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

The project area has not been surveyed and may contain prehistoric/historic archaeological resources. Accordingly, a Phase I archaeological reconnaissance survey to locate, identify, and record all archaeological resources within the project area will be required. This decision is based upon our understanding that there has not been any large scale disturbance of the ground surface (excluding agricultural activities) such as major construction activity within the project area which would have destroyed existing cultural resources prior to your project. If the area has been heavily disturbed prior to your project, please contact our office with the appropriate written and/or photographic evidence.

The area(s) that need(s) to be surveyed include(s) all area(s) that will be developed as a result of the issuance of the federal agency permit(s) or the granting of the federal grants, funds, or loan guarantees that have prompted this review. In addition to the archaeological survey please provide clear photographs of all structures in, or adjacent to, the current project area as part of the archaeological survey report.

Enclosed you will find an attachment briefly describing Phase I surveys and a list of archaeological contracting services. THE IHPA LOG NUMBER OR A COPY OF THIS LETTER SHOULD BE PROVIDED TO THE SELECTED PROFESSIONAL ARCHAEOLOGICAL CONTRACTOR TO ENSURE THAT THE SURVEY RESULTS ARE CONNECTED TO YOUR PROJECT PAPERWORK.

If you have further questions, please contact Joe Phillippe at 217/785-1279.

Sincerely,

Rachel Leibowitz, Ph.D.
Deputy State Historic
Preservation Officer

Enclosure

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

REPLY TO
ATTENTION OF:

June 8, 2016

Engineering and Construction Division
Curation and Archives Analysis Branch (EC-Z)

Ms. Rachel Leibowitz
Deputy State Historic Preservation Officer
Illinois Historic Preservation Agency
1 Old State Capitol Plaza
Springfield, Illinois 62701-1507

Subject: Dogtooth Bend Phase 6 (Len Small): IHPA LOG #001032216

Dear Ms. Leibowitz:

The United States Army Corps of Engineers (USACE) is presently planning bankline and levee stabilization efforts, and construction of a kicker dike in the Len Small Levee District, Alexander County, Illinois (Figure 1). The work comprises the Dogtooth Bend Phase 6 (Len Small) Project. We are contacting your office to continue consultation under Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and its implementing regulation 36 CFR 800. Initial notification of emergency restoration efforts was provided in a March 16th letter from this office, and the project was assigned the IHPA LOG #001032216.

Background

The Congress of the United States, through the enactment of a series of Rivers and Harbors Acts beginning in 1824, authorized the Secretary of the Army, by and through the U.S. Army Corps of Engineers St. Louis District (District), to provide a safe and dependable navigation channel on the Middle Mississippi River (MMR). In 1927 Congress ordered USACE to study the feasibility of a 9-foot channel on the Upper Mississippi. On July 3, 1930, an amended Rivers and Harbors act was signed by President Hoover authorizing the creation of the channel. For the Upper Mississippi above St. Louis, the primary mechanism implemented to achieve this goal was the lock-and-dam system built in the 1930s and 1940s. On the MMR, the USACE's Regulating Works Project utilizes bank stabilization and sediment management to maintain bank stability and ensure adequate navigation depth and width.

Need

During the high water event of December 2015-January 2016, the Len Small levee sustained significant damage, including a nearly mile-long breach with associated floodplain scouring along with a failure of the adjacent Mississippi River bankline. The damage occurred in Township 16S, Range 2W, Sections 30 and 31, with the main bankline failure at approximately river mile 33.3. Phase I emergency repairs, consisting of re-establishing the original bankline, were undertaken between January 26 and February 16, 2016. To date, the levee breach and associated scour have not been repaired, and the threat of a major channel cutoff exists (Figure 2). There is an imminent need to pursue federal action under the Regulating Works Project to reduce the risk of this channel cutoff forming and continued degradation of the bankline. A cutoff across Dogtooth Bend would disrupt Mississippi River navigation for an indefinite period of time.

Project

Dogtooth Bend Phase 6 consists of two priority activities, Phase 2 and Phase 3 (Table 1 and Figure 3), which took into consideration potential actions under any levee repair. The Corps would be pursuing Phase 2 activities in the near-term to meet project objectives; however, Phase 3 activities would not be pursued without further engineering design and stakeholder input. Phase 2 activities would be needed regardless of the Len Small levee restoration to meet the project objectives. In Phase 3, the Corps would be pursuing a construction solution such as a grade control structure if the Len Small levee is not restored; however, the location and design of this type of feature has not be determined. Once further information has been obtained for this feature, the Corps would prepare a supplement/addendum to this notification which would assess the impacts of this feature on historic and cultural resources.

Phase 2 activities would consist of stabilizing the southern levee end (A_1), stabilizing the northern levee end (A_2), stabilizing the perched scour north of the bankline breach (A_3), establishing a stone blanket at the riverside toe of the northern intact levee section (A_4), and constructing a kicker dike to act as a false bankline to divert high flows away from the existing scour hole (C_1). Phase 3 activities would consist of establishing a grade control structure (C_2) within the proposed work area (location to be determined), if the Len Small levee is not restored.

Construction would require both land-based and water-based access to build the rock structures. Land-based construction would require building haul roads (Figure 3). Water-based construction would require dredging for access to build the rock structures (approximately 2,600 cubic yards of dredged material).

Table 1. Work to be Completed and Purpose

Task	Activity	Work to be Completed	Purpose	Stone Quantities
Phase 2	A_1	Stabilize southern levee end by establishing a grade that would support rock placement, and then armoring the levee ends	To reduce potential risk of channel cutoff and to prevent further degradation from additional high water	16,000 TN
	A_2	Stabilize northern levee end by establishing a grade that would support rock placement, and then armoring the levee ends	To reduce potential risk of channel cutoff and to prevent further degradation from additional high water	10,000 TN
	A_3	Stabilize the perched scour hole north of the bankline breach along the bank by armoring the hole's bank adjacent to the river bank	To reduce potential risk of channel cutoff	10,000 TN
	A_4	Establish a stone blanket at the riverside toe of the northern intact levee section from the levee end back approximately 300 feet to the 1993 repair	To reduce potential risk of channel cutoff	10,000 TN
	C_1	Construct a kicker dike off of the bankline repair of Phase 1	To reduce potential risk of channel and act as a false bankline	107, 000 TN
P 3	C_2	Establish grade control structure if Len Small levee is not restored	To reduce potential risk of channel cutoff	TBD

Landform Disturbance

The project area has been heavily disturbed by the recent high water event and the associated floodplain scouring. The extensive scour hole is over thirty feet deep in places (Figure 4). Additionally, a thick layer of sand has been deposited over a large area by the flood waters (Figure 5). The majority of the project footprint is within the current scour hole (Figure 3). An exception is the haul road to the north of the proposed grade control structure.

Landform History

The project is located on an old scar of the Mississippi River, which has been repeatedly inundated during flood events, most noticeably the 1993 flood. The land upon which the northern project features are located is also predominantly of late nineteenth century origin. On an 1866 chart, the chute between Goose Island and the Illinois riverbank is still active (Figure 6). By 1885, however, it had largely been filled in by sedimentation (Figure 7). The area of the proposed haul road, however, was still largely within the Mississippi River. Sometime around the turn of the century, USACE constructed pile dikes from the Illinois shore, which led to the formation of the current Goose Island (Figure 8). The area, however, continued to be occasionally inundated. Most notably, the 1993 flood essentially re-opened the chute behind the original Island (Figure 9) scouring out the area of the proposed haul road and levee armoring.

Previous Archaeological Research

Predictably, no archaeological sites are known in the meander scar on which the project is located. The nearest site is approximately 4,300 feet to the northwest on the terrace above the landform. An archaeological survey of Illinois bankline between river mile 32.2L and 34.7L was conducted in 1977 with no finds. The authors contended that due to the recent river alluvium in this reach there was "little chance of finding signs of aboriginal occupation in the area" (Stanteford 1977:14).

Potential Shipwrecks

During the summer of 1988 when the Mississippi River was at a particularly low level, the St. Louis District Corps of Engineers conducted an aerial survey of exposed wrecks between Saverton, Missouri, and the mouth of the Ohio River. The nearest observed wreck is located at MRM 33.7R, a wooden barge vessel located in a sand bar on the west (right descending, i.e., opposite) bank of the river. The nearest left descending bank (eastern) wrecks are in the Sante Fe Chute a few miles upstream. The river bed in the work area is surveyed at minimum once every two years, with the latest processed survey having been completed in 2014. Further, a bathymetry survey was performed in January 2016 in and around the breached area to detect and record scour depths. The multi-beam surveys detected no topographic anomalies suggesting the presence of unknown wrecks.

Potential Effects on Cultural Resources

Given the method of construction (minimal grading), the extensive disturbance of the area by the levee breech and floodplain scouring, the history of landscape reworking by previous flood events, the late nineteenth century origin of the much of the landform, the lack of any survey evidence for extant wrecks, it is our opinion that the proposed undertaking will have no significant effect on cultural resources.

If you have any questions or comments, please feel free to contact me at (314) 331-8466 or Dr. Mark Smith at (314) 331-8831 (e-mail: mark.a.smith4@usace.army.mil).

Sincerely yours,

for Michael K. Trimble, Ph.D.
Chief, Curation and Archives Analysis Branch

Enclosure

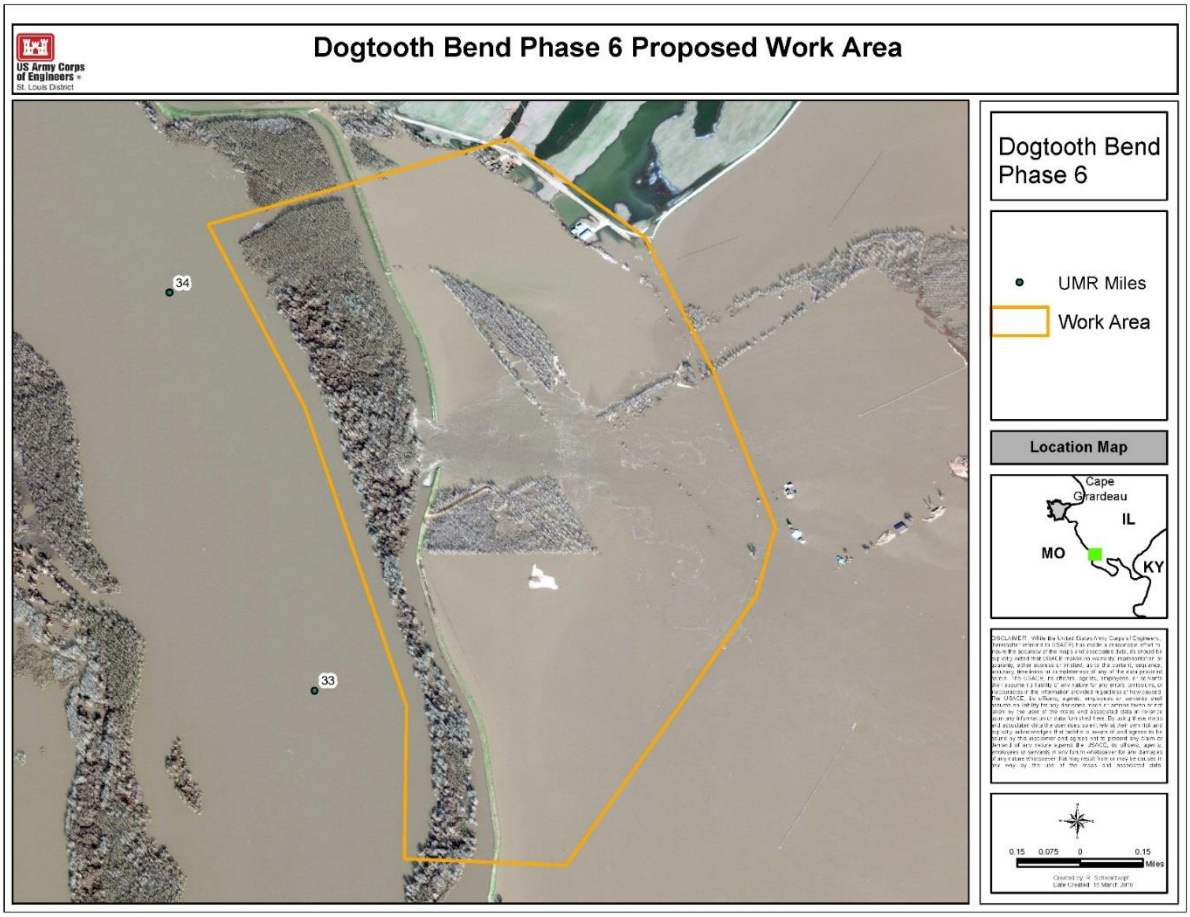


Figure 1. Location map of the proposed work area.

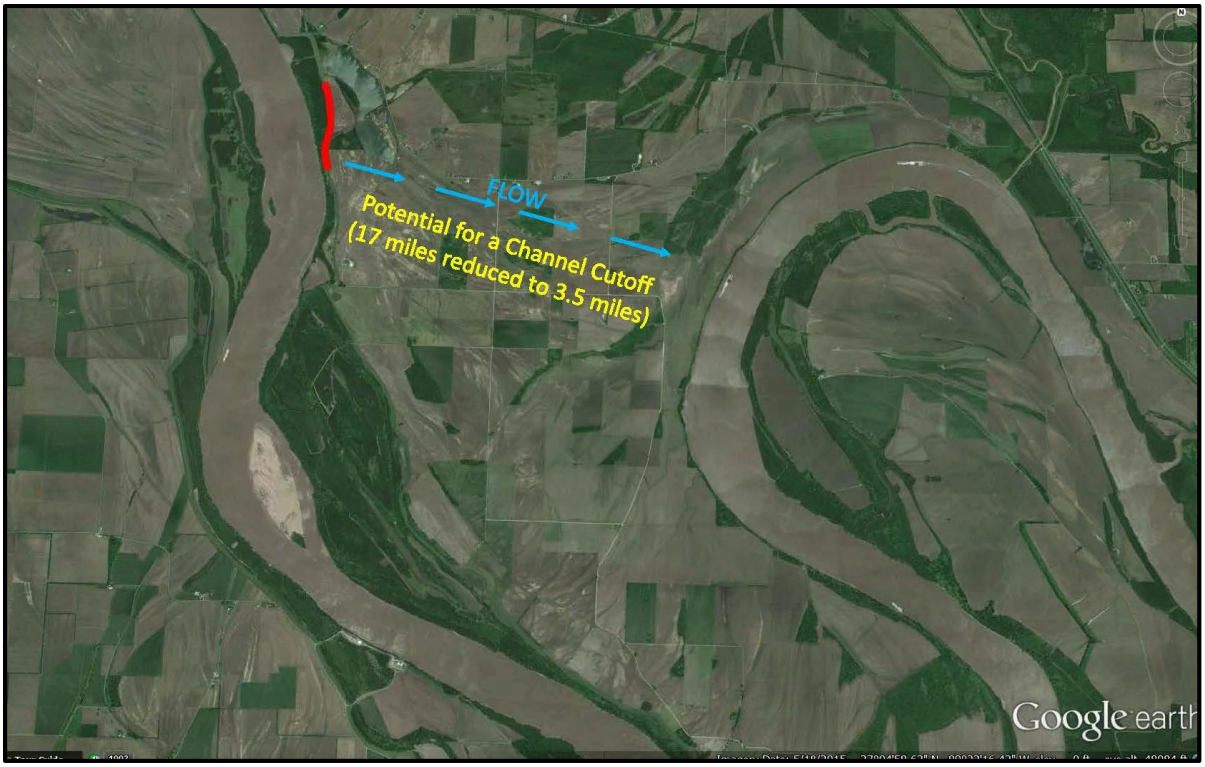


Figure 2. Location of potential channel cutoff.

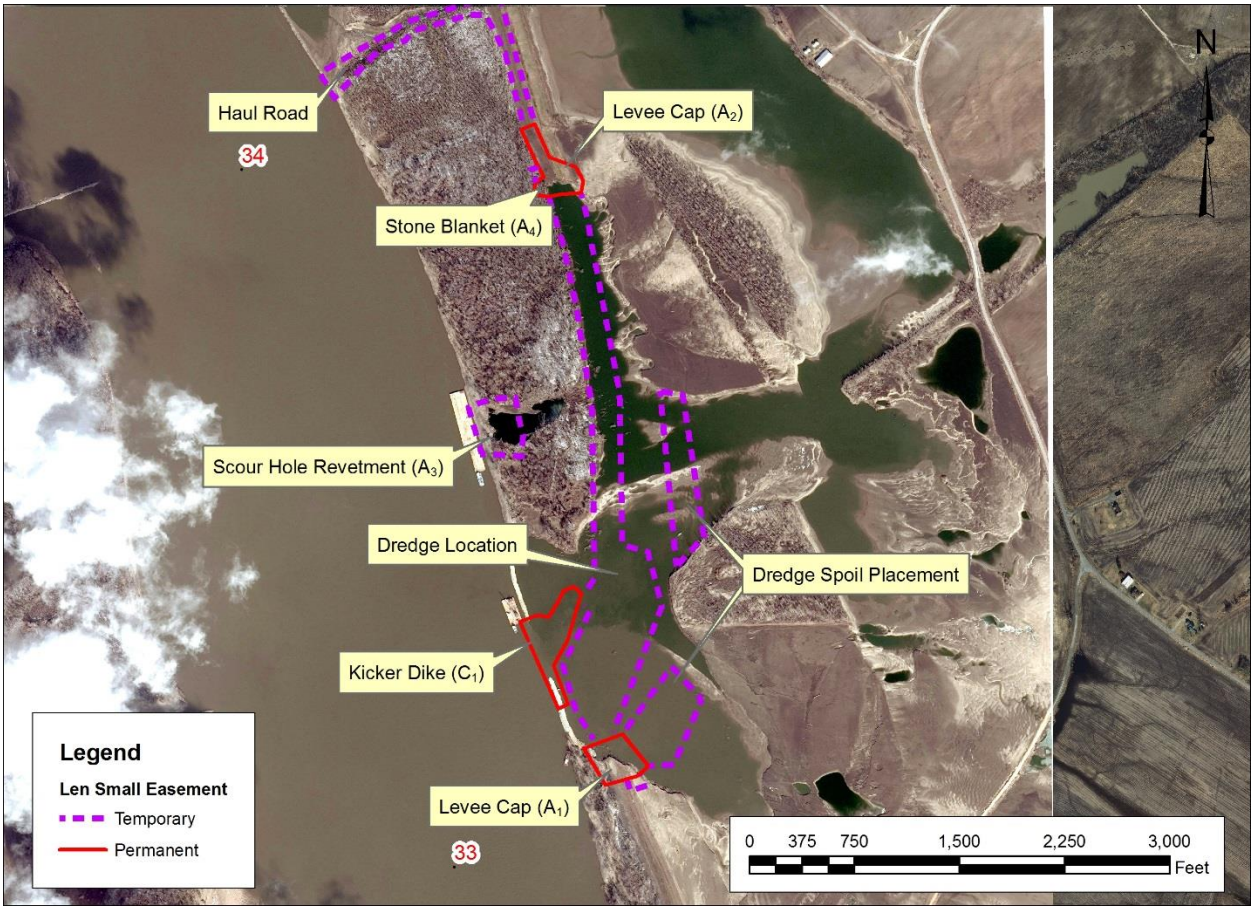


Figure 3. Permanent structures (A_{1-4} and C_1) outlined in red.

Figure 4. Photograph of scour hole.

Figure 5. Photograph showing sand deposition near the project area.

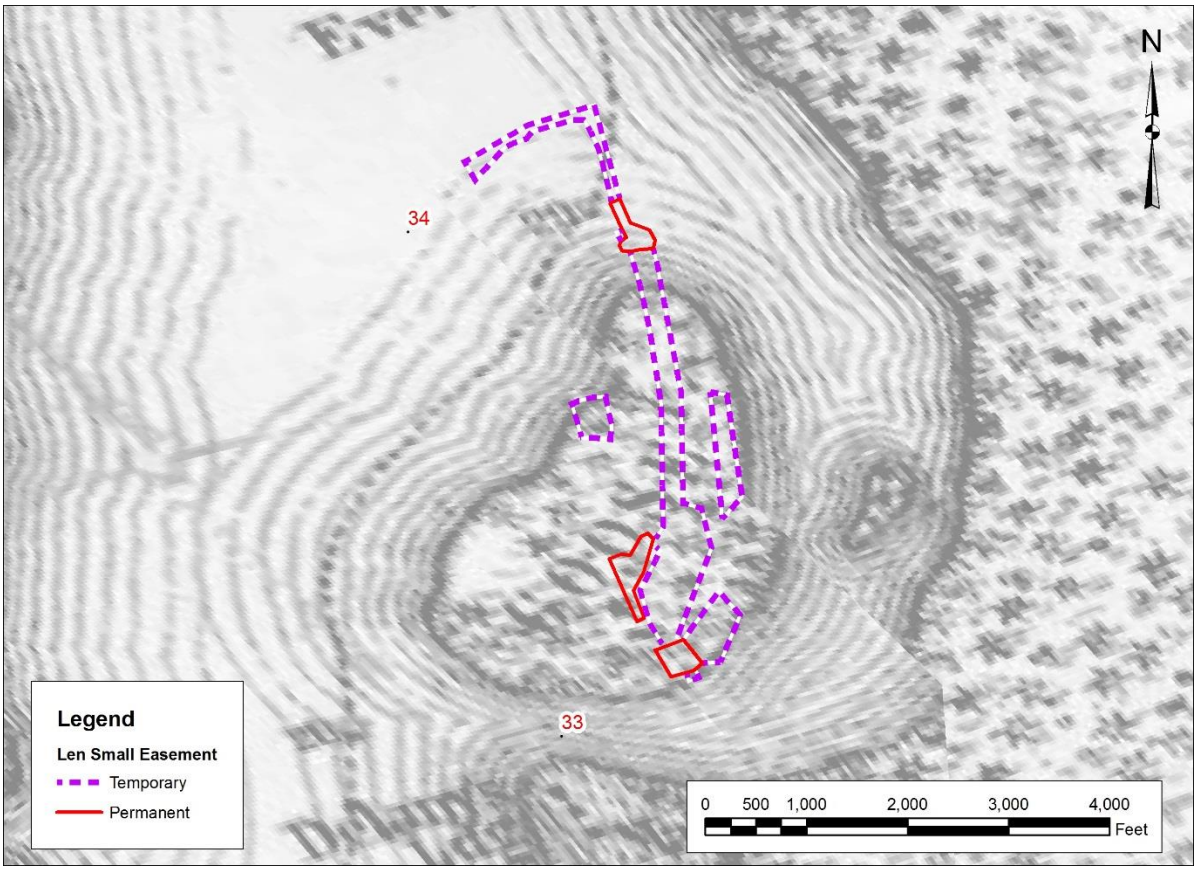


Figure 6. 1866 map showing project footprint (Mississippi River Squadron 1866).

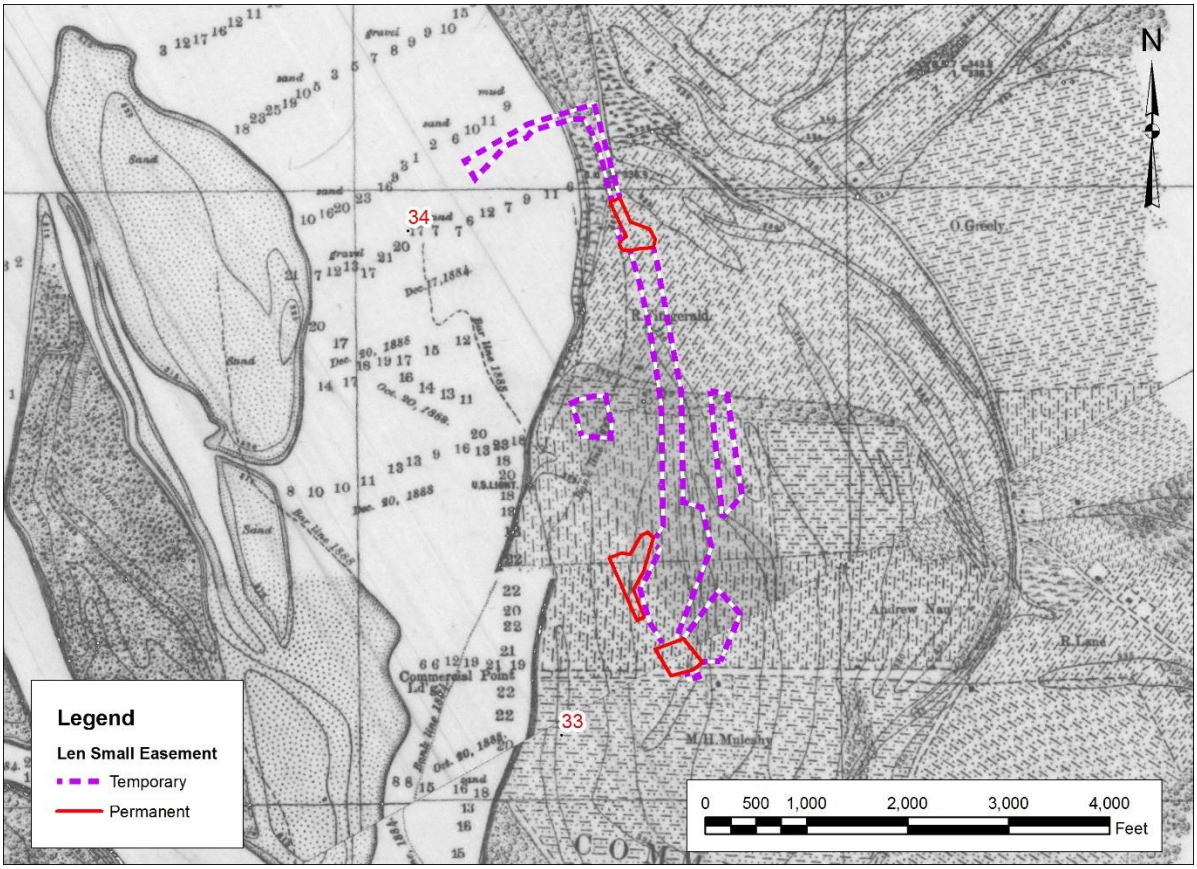


Figure 7. 1885 chart showing project footprint (Mississippi River Commission 1885).

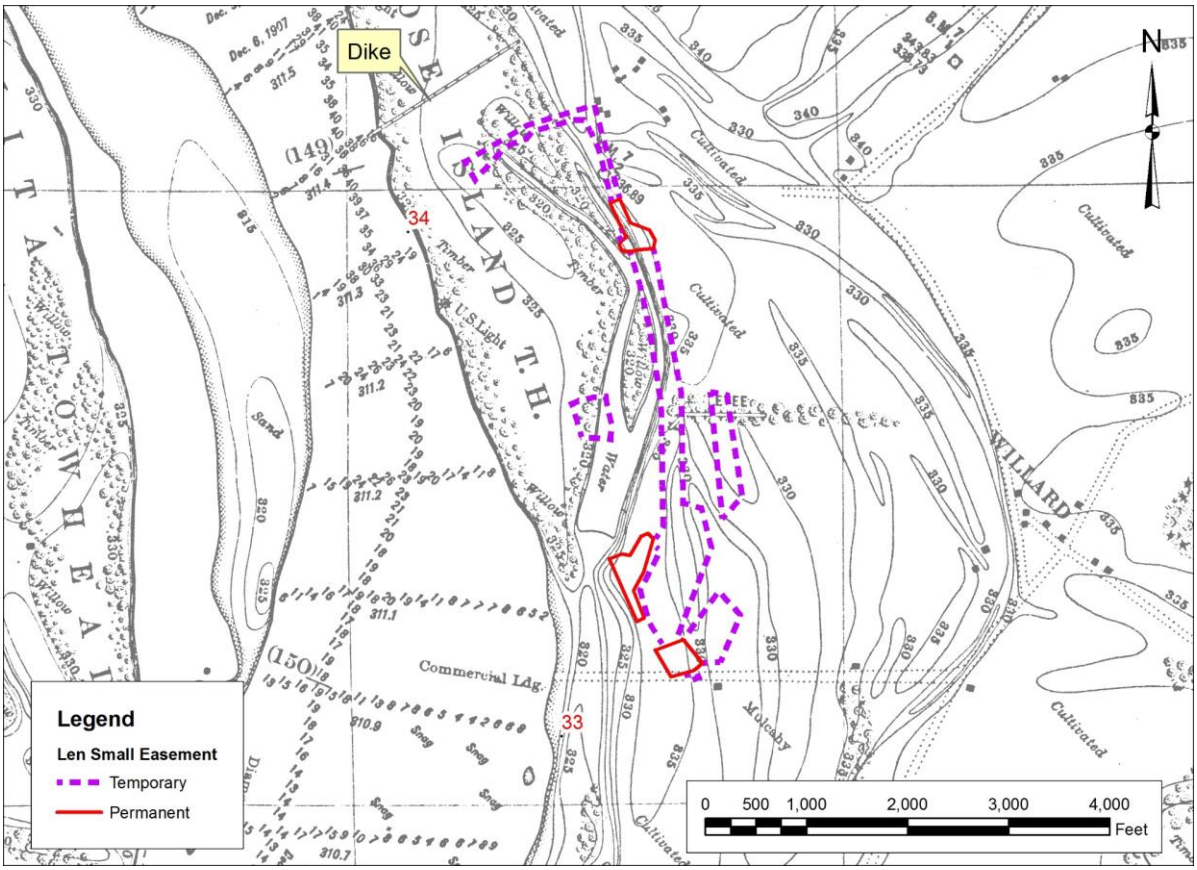


Figure 8. 1908 chart showing project footprint (Board of Examination and Survey of Mississippi River, 1908).

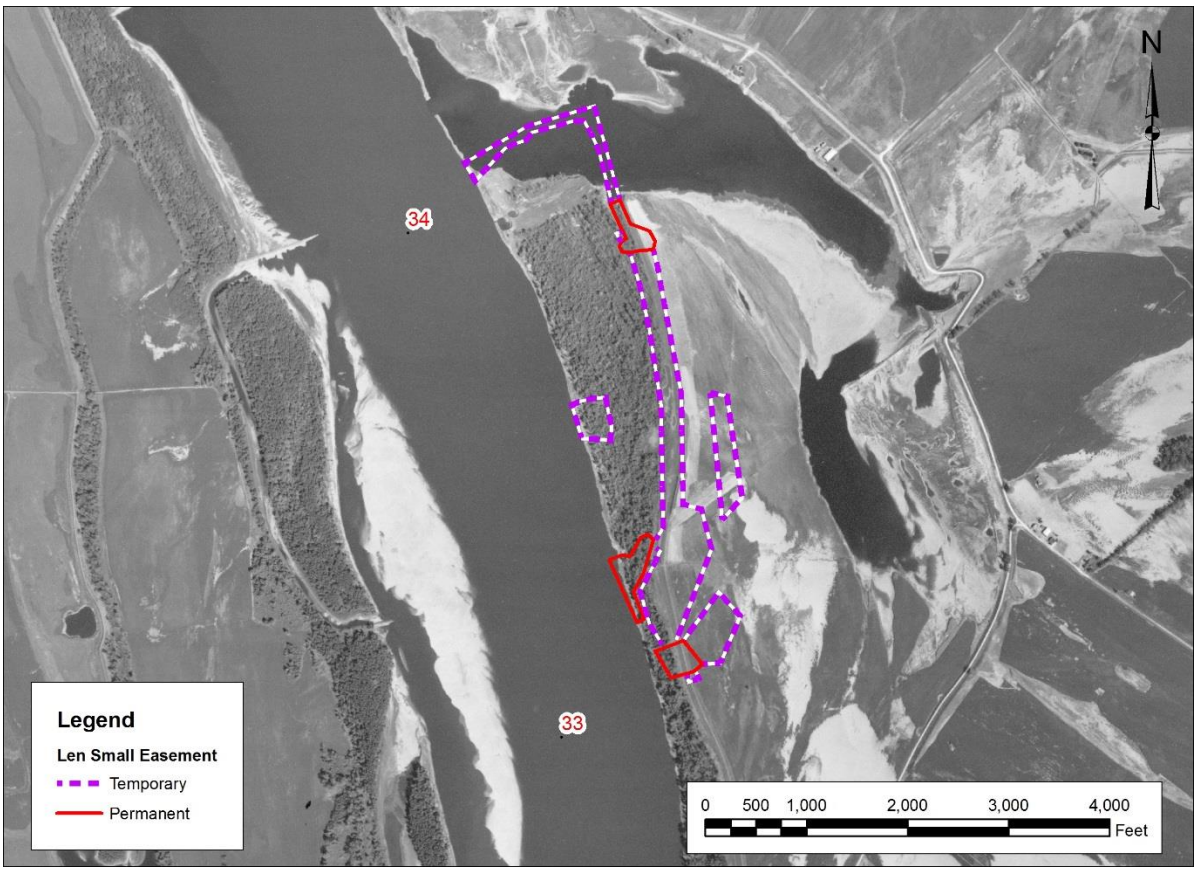


Figure 9. 1994 aerial photograph showing scour remaining from the 1993 flood.

References Cited

Board of Examination and Survey of Mississippi River
1908 Chart No.16. U.S Lake Survey, Detroit MI.

Mississippi River Commission
1885 Chart No 102. Survey of the Mississippi River.

Mississippi Squadron Reconnaissance.
1866 Sheet No. 2. Mississippi River Charts from Cairo IL to St. Marys MO.

Santeford, Lawrence G.
1977 Report on an Archaeological Reconnaissance of Selected Portions of the Mississippi River Shoreline in Southern Illinois. Southern Illinois University, Carbondale IL.

Illinois Historic
Preservation Agency

1 Old State Capitol Plaza, Springfield, IL 62701-1512

FAX 217/524-7525
www.illinoishistory.gov

Alexander County
Miller City
Santa Fe Road, Miller City Road, Watson Road, Levee Road
Section:30-Township:16S-Range:2W, Section:31-Township:16S-Range:2W
COESTL
Emergency Levee Repairs - Len Small Levee

PLEASE REFER TO: IHPA LOG #001032216

June 23, 2016

Michael K. Trimble, Ph.D., Chief
Department of the Army
St. Louis District, Corps of Engineers
Curation and Archives Analysis Branch (EC-Z)
1222 Spruce St.
St. Louis, MO 63103-2833

Dear Chief Trimble:

We have reviewed the documentation submitted for the referenced project(s) in accordance with 36 CFR Part 800.4. Based upon the information provided, no historic properties are affected. We, therefore, have no objection to the undertaking proceeding as planned.

Please retain this letter in your files as evidence of compliance with section 106 of the National Historic Preservation Act of 1966, as amended. This clearance remains in effect for two (2) years from date of issuance. It does not pertain to any discovery during construction, nor is it a clearance for purposes of the Illinois Human Skeletal Remains Protection Act (20 ILCS 3440).

If you are an applicant, please submit a copy of this letter to the state or federal agency from which you obtain any permit, license, grant, or other assistance.

Sincerely,

Rachel Leibowitz, Ph.D.
Deputy State Historic
Preservation Officer

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

REPLY TO
ATTENTION OF:

June 15, 2016

Engineering and Construction Division
Curation and Archives Analysis Branch

Governor Edwina Butler-Wolfe
Absentee-Shawnee Tribe of Indians of Oklahoma
2025 South Gordon Cooper Drive
Shawnee, Oklahoma 74810-9381

Dear Governor Butler-Wolfe:

The United States Army Corps of Engineers (USACE), St. Louis District is providing information in this letter that addresses the planning of a bankline and levee stabilization and the construction of a kicker dike on the Mississippi River at approximately river mile 33.3. This project, Dogtooth Bend Phase 6, consists of two priority activities, Phase 2 and Phase 3, which take into consideration potential actions under any levee repair. The Corps will be pursuing Phase 2 activities this year (2016). Phase 3 activities will not be pursued without further engineering design and stakeholder input. This letter will address Phase 2.

This project is located in the Len Small Levee District, Alexander County, Illinois (Figures 1a and 1). This federal action requires compliance with Section 106 of the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and the Clean Water Act (CWA). This project is referred to as the Dogtooth Bend Phase 6 (Len Small) Project.

In 1824 Congress enacted a series of rivers and harbor acts authorizing the Secretary of the Army to provide a safe and dependable navigation channel on the Middle Mississippi River (MMR). In 1927 Congress ordered USACE to study the feasibility of a 9-foot channel on the Upper Mississippi. On July 3, 1930, an amended Rivers and Harbors Act was signed by President Hoover authorizing the creation of the channel. For the Upper Mississippi above St. Louis, the primary mechanism to achieve this goal was the lock-and-dam system built in the 1930s and 1940s. On the MMR, USACE utilized bank stabilization and sediment management to maintain bank stability and ensure adequate navigation depth and width.

During the high water event of December 2015–January 2016, the Len Small levee sustained signification damage, including a nearly mile-long breach with associated floodplain scouring along with the failure of the adjacent Mississippi River bankline. The damage occurred in Township 16S, Range 2W, Sections 30 and 31, with the bankline failure at approximately river mile 33.3. To date, the levee breach and associated scour have not been repaired, and the threat of a major channel cutoff exists (Figure 2). There is an imminent need to pursue federal action under the Regulating Works Project to reduce the risk of this channel cutoff forming and to prevent the continued deterioration of the bankline. If this area was cut off it would disrupt Mississippi River Navigation for an indefinite period of time.

Phase 2 activities (Figures 1a and 3) will consist of stabilizing the southern levee end (A_1), stabilizing the northern levee end (A_2), stabilizing the perched scour north of the bankline beach (A_3), establishing a stone blanket at the riverside tow of the northern intact levee section (A_4), and constructing of a kicker dike that will act as a false bankline to divert high flows away from and the existing scour hole (C_1). Construction will require both land and water-based access to build the rock structures. Land-based construction would require building haul roads (Figure 3). Water-based construction would require dredging for access to build the rock structures.

The project area has been heavily disturbed by the recent high water event and the associated floodplain scouring. The extensive scour hole is over thirty feet deep in places (Figure 4). Additionally, a thick layer of sand has been deposited over a large area by the flood waters (Figure 5). Most of the project footprint is within the current scour hole with the exception of the haul road to the north of the scour hole (Figure 3).

The project is located on an old scar of the Mississippi River, which has been repeatedly inundated during flood events, most noticeably the 1993 flood. The land upon which the northern project features are located is of late nineteenth century origin. On an 1866 chart, the chute between Goose Island and the Illinois riverbank is still active (Figure 6). By 1885 it has largely been filled in by sedimentation (Figure 7); however, the area of the proposed haul road was largely within the Mississippi River until the turn of the century. At the turn of the century USACE constructed pile dikes from the Illinois shore line, which led to the formation of the current Goose Island (Figure 8). However, this area continues to be inundated, most notably in the 1993 flood, which re-opened the chute behind the original Island (Figure 9) scouring out the area of the proposed haul road and levee armoring.

No archaeological sites are known in the meander scar where the project is located. The nearest site is approximately 4,300 feet to the northwest on the terrace above the landform. An archaeological survey of the Illinois bankline between river mile 32.3L and 34.7L was conducted in 1977 with no finds. During the summer of 1988, when the Mississippi River was at a particularly low level, USACE St. Louis District conducted an aerial survey of exposed wrecks between Saverton, Missouri, and the mouth of the Ohio River. The nearest observed wreck is located at MRM 33.7R, a wooden barge vessel located in a sand bar on the west (right descending, i.e., opposite) bank of the river. The nearest left descending bank (eastern) wrecks are in the Santa Fe Chute a few miles upstream. The river bed in the work area is surveyed at a minimum of once every two years, with the latest processed survey having been completed in 2014. Further, a bathymetry survey was performed in January 2016 in and around the breached area to detect and record scour depths. The multi-beam surveys detected no topographic anomalies suggesting the presence of unknown wrecks.

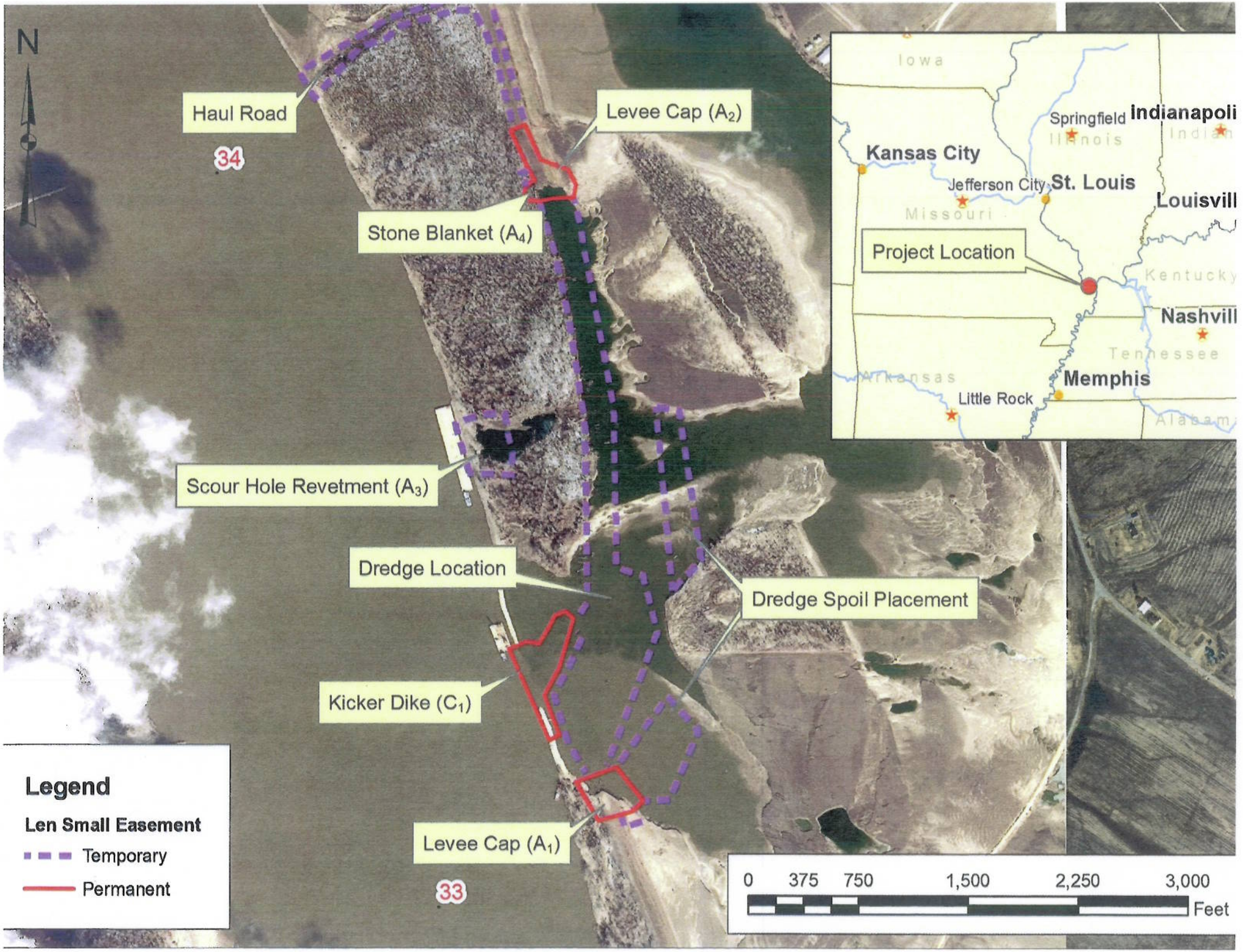
Given the method of construction (minimal grading), the extensive disturbance of the area by the levee breech and floodplain scouring, the history of landscape reworking by previous flood events in the late nineteenth century, and the lack of any survey evidence of extant wrecks, it is our opinion that the proposed undertaking will have no significant effect on cultural resources.

The USACE St. Louis District is requesting you review the maps and information about this project and notify our office if you would like to consult on this project or you have any concerns, such as traditional cultural properties or sacred sites that are located within or near the repair sites. Please notify our office no later than August 8, 2016, if you have any areas of concern. If you have any questions regarding this matter, please contact Ms. Roberta L. Hayworth, Native American Coordinator, directly at (314) 331-8833, or by electronic mail at roberta.l.hayworth@usace.army.mil. Thank you in advance for your timely review of this request. A copy of this letter has been furnished to Mr. Leonard Longhorn.

Sincerely,

Michael K. Trimble, Ph.D.
Chief, Curation and Archives
Analysis Branch

Enclosures


N
Haul Road
34
Levee Cap (A_2)
Stone Blanket (A_4)
Scour Hole Revetment (A_3)
Dredge Location
Dredge Spoil Placement
Kicker Dike (C_1)
Levee Cap (A_1)
33
Iowa
Springfield
Indianapoli
Illinois
Kansas City
Jefferson City
St. Louis
Louisvill
Missouri
Project Location
Kentucky
Nashvill
Tennessee
Arkansas
Memphis
Little Rock
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Len Small Easement
Temporary
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Feet

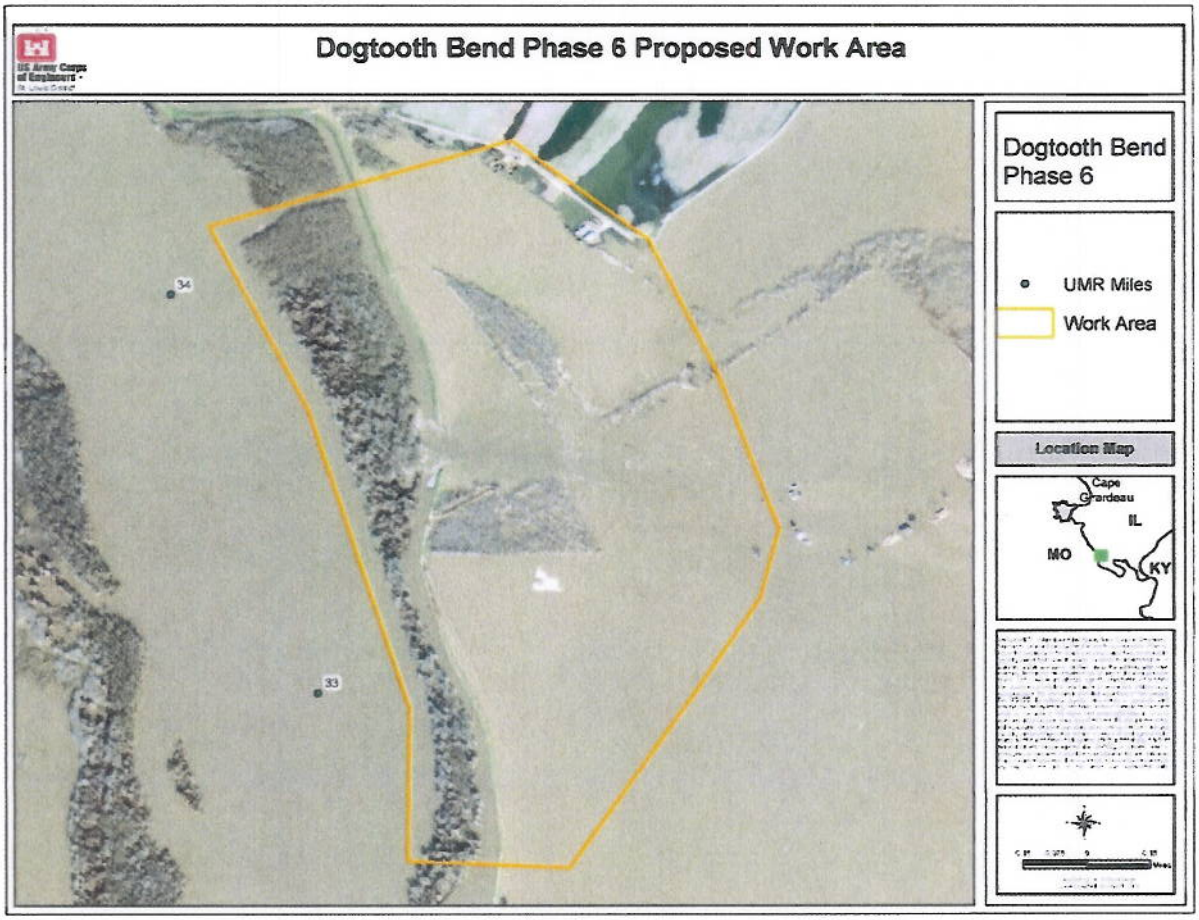
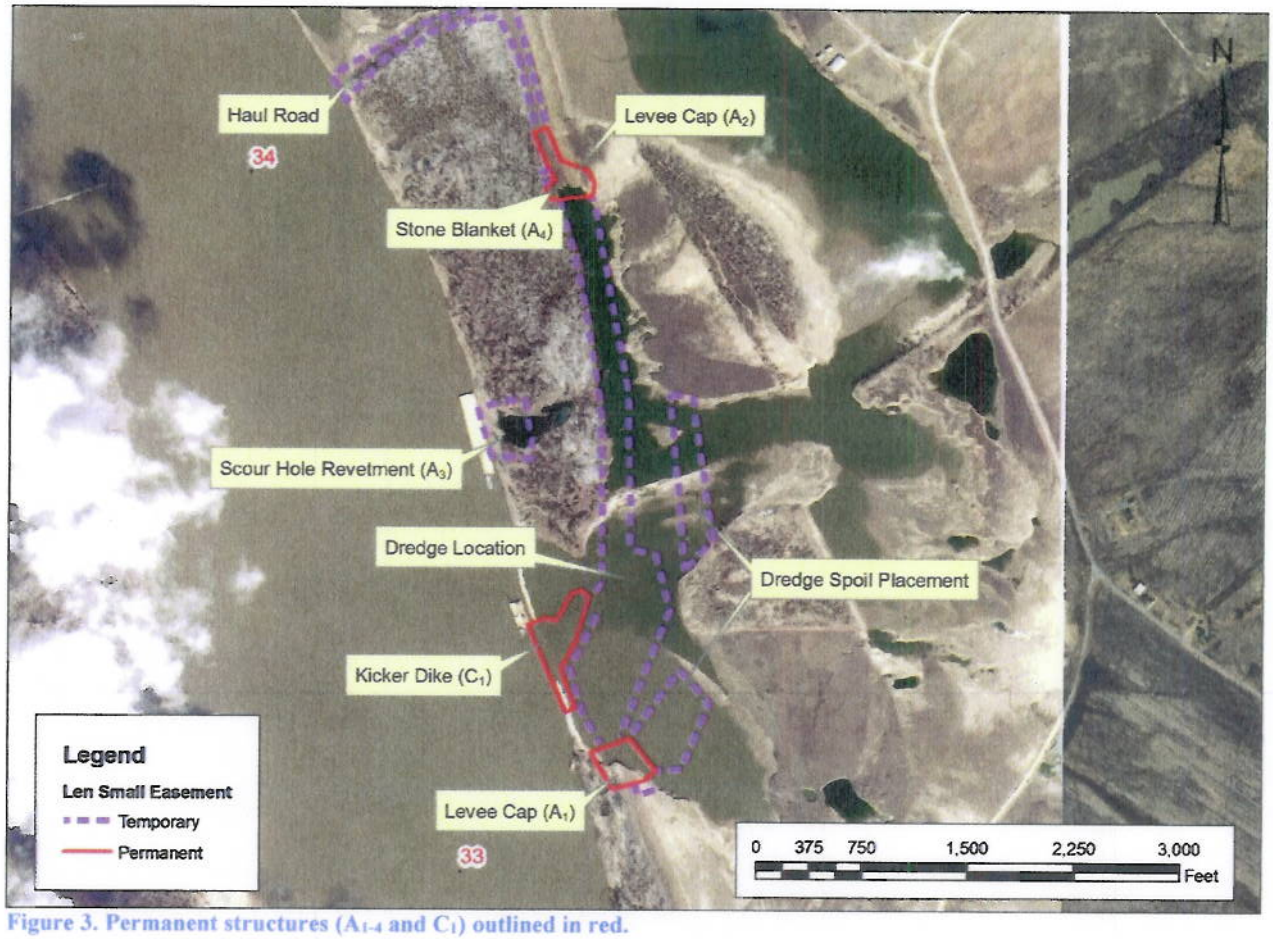


Figure 1. Location map of the proposed work area.

Figure 2. Location of potential channel cutoff.



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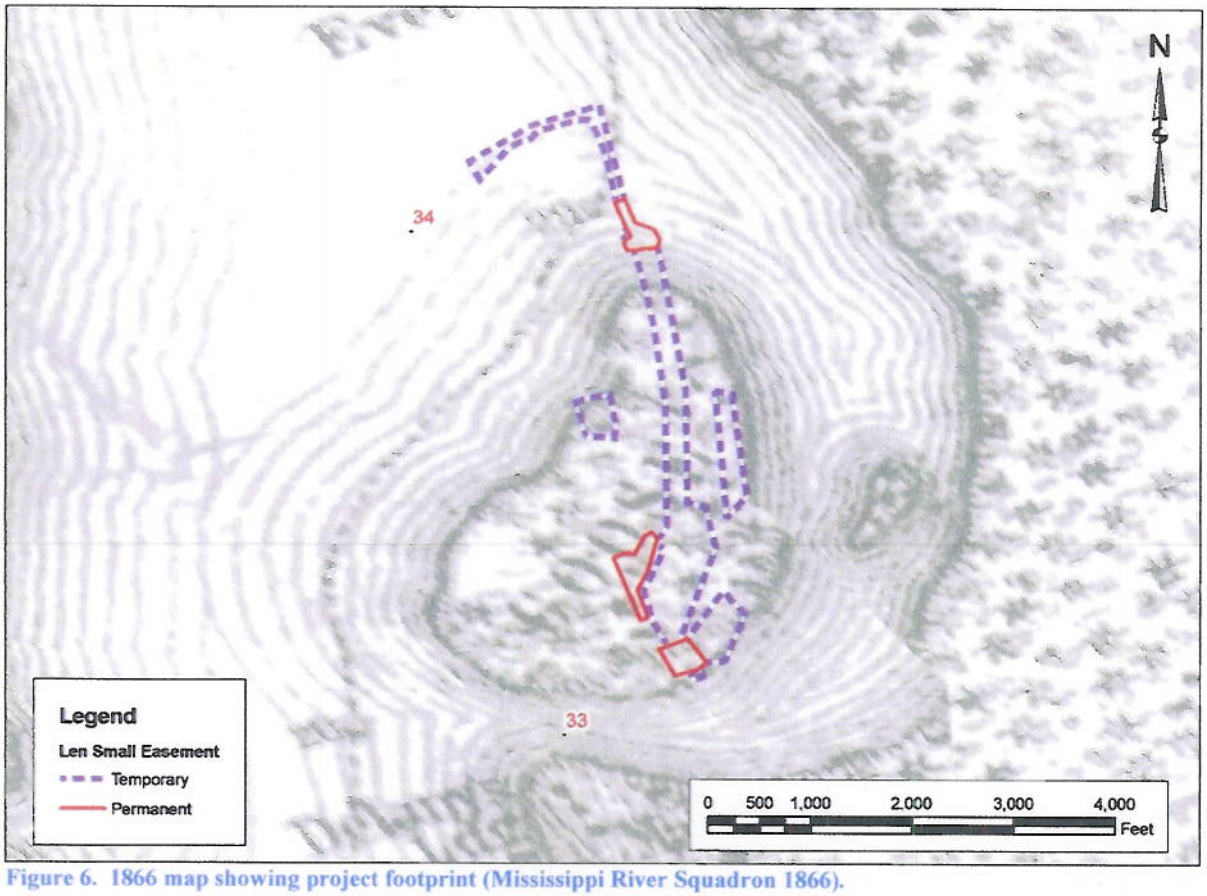

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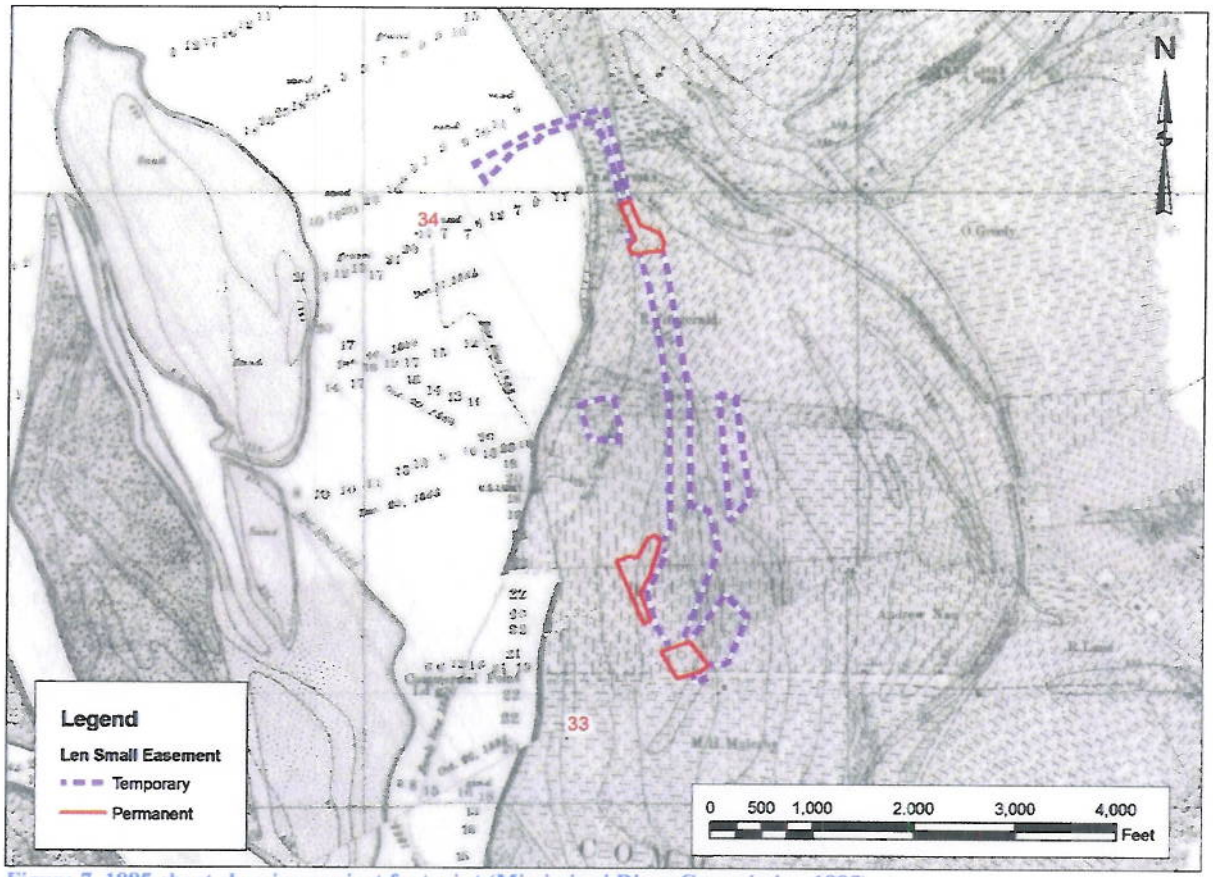

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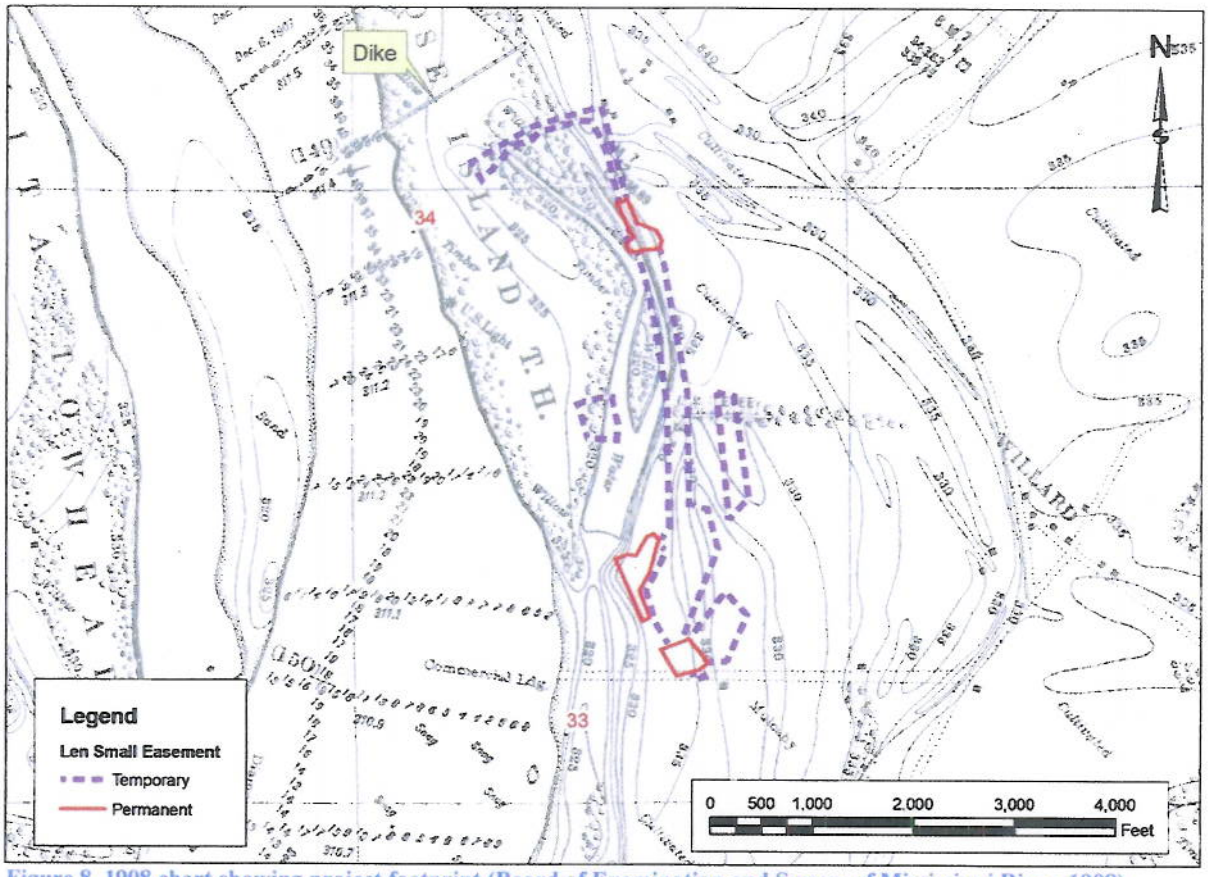

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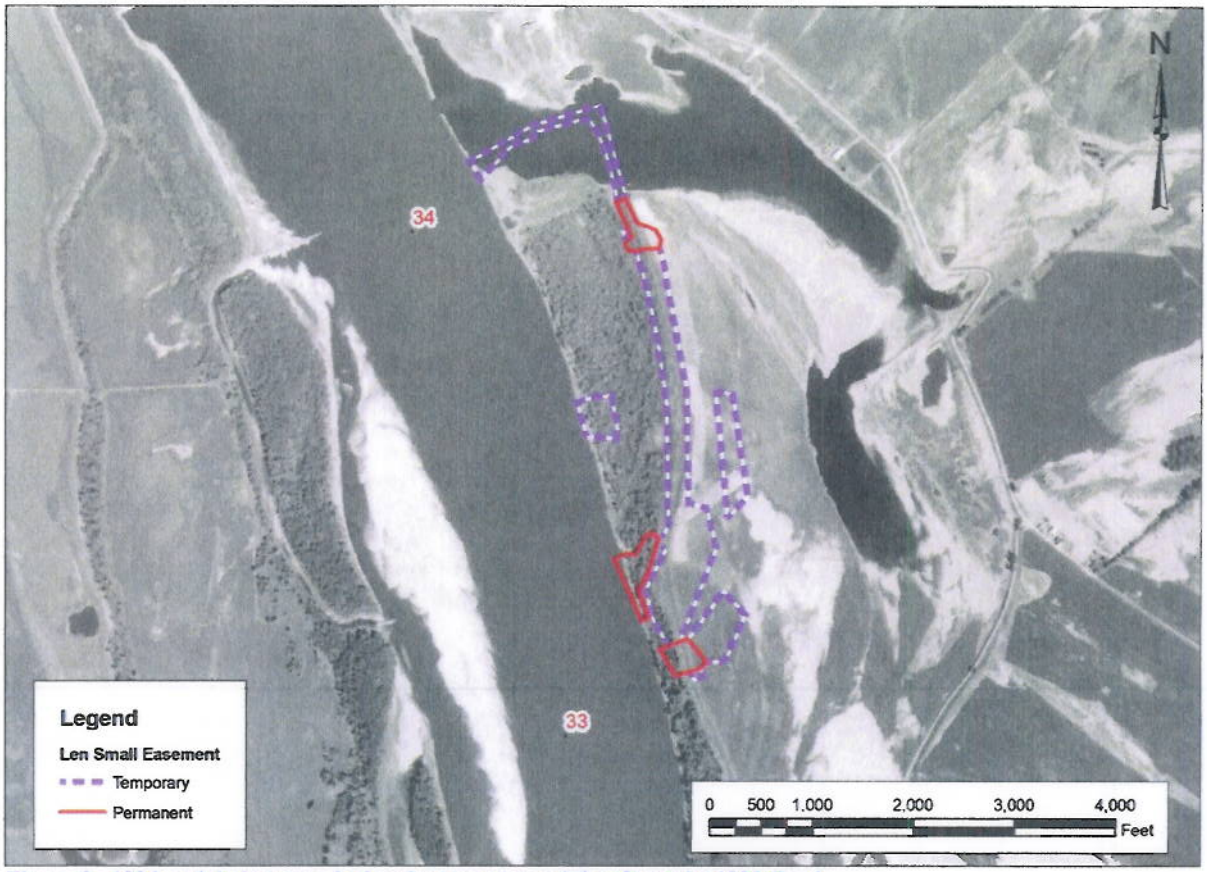

Figure 9. 1994 aerial photograph showing scour remaining from the 1993 flood.

SAME LETTER SENT:

TRIBAL CHAIRPERSONS

Governor Edwina Butler-Wolfe
Absentee-Shawnee Tribe
2025 S. Gordon Cooper Drive
Shawnee, Oklahoma 74810-9381

Chief Glenna J. Wallace
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Seneca, Missouri 64865

Chairman Ron Sparkman
Shawnee Tribe
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Miami, Oklahoma 74355

Principal Chief Bill John Baker
Cherokee Nation
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Tahlequah, Oklahoma 74465

Chief Joe Bunch
United Keetoowah Band of Cherokee
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Chief Chester Brooks
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Fulton, Michigan 49052

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P.O. Box 765
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SAME LETTER SENT:

TRIBAL REPRESENTATIVE:

Mr. Leonard Longhorn
Tribal Historic Preservation Officer
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2025 Gordon Cooper Drive
Shawnee, Oklahoma 74810-9381

Ms. Robin DuShane
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Cultural Center
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Harris, Michigan 49845

Mr. John Rodwan
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Potawatomi, Michigan
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Tribal Historic Preservation Officer
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Mayetta, Kansas 66509

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Black River Falls, Wisconsin 54615

Ms. Emily DeLeon
Tribal Historic Preservation Officer
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White Cloud, Kansas 66094

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Iowa Tribe of Oklahoma
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Tribal Historic Preservation Officer
The Quapaw Tribe of Oklahoma
P.O. Box 765
Quapaw, Oklahoma 74363

EcoCAT
Ecological Compliance Assessment Tool

ILLINOIS DEPARTMENT OF NATURAL RESOURCES

Applicant: U.S. Army Corps of Engineers, St. Louis District
Contact: Kat McCain
Address: 1222 Spruce Street
St. Louis, MO 63103

IDNR Project Number: 1611273
Date: 05/31/2016

Project: Regulating Works Dogtooth Bend Phase 6
Address: Miller City Road, Miller City

Description: The work area is located in Alexander County, Illinois and is adjacent to the left descending bank of the Mississippi River at approximately river miles 34-33. During the high water event of late December 2015-early January 2016, the Len Small levee near Miller City, Illinois sustained significant damage. There is an imminent need to pursue federal action under the Regulating Works Project to reduce the risk of a channel cutoff forming and continued degradation of the bankline in order to maintain the navigation channel. The District has concluded through analysis that stabilizing the bankline and scour hole, constructing a kicker dike off the bankline repair, and constructing a grade control structure would reduce the risk of a channel cutoff and decrease the potential for future bankline damage.

Natural Resource Review Results

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the project location:

Bumgard Island INAI Site
Burnham Island INAI Site
Illinois Chorus Frog *(Pseudacris illinoensis)*
Indiana Bat *(Myotis sodalis)*
Shrimp Crayfish *(Orconectes lancifer)*

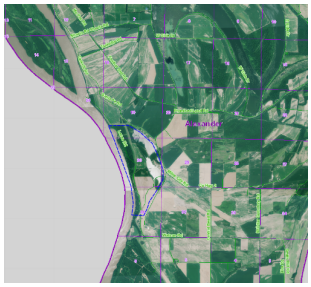
An IDNR staff member will evaluate this information and contact you to request additional information or to terminate consultation if adverse effects are unlikely.

Location

The applicant is responsible for the accuracy of the location submitted for the project.

County: Alexander

Township, Range, Section:
16S, 2W, 19
16S, 2W, 29
16S, 2W, 30
16S, 2W, 31



IL Department of Natural Resources Contact
Nathan Grider
217-785-5500
Division of Ecosystems & Environment

Government Jurisdiction
U.S. Army Corps of Engineers

Disclaimer

The Illinois Natural Heritage Database cannot provide a conclusive statement on the presence, absence, or condition of natural resources in Illinois. This review reflects the information existing in the Database at the time of this inquiry, and should not be regarded as a final statement on the site being considered, nor should it be a substitute for detailed site surveys or field surveys required for environmental assessments. If additional protected resources are encountered during the project's implementation, compliance with applicable statutes and regulations is required.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Marion Ecological Services Sub-Office
MARION ILLINOIS SUB-OFFICE, 8588 ROUTE 148
MARION, IL 62959
PHONE: (618)997-3344 FAX: (618)997-8961
URL: www.fws.gov/midwest/Endangered/section7/s7process/step1.html

Consultation Code: 03E18100-2016-SLI-0184 March 11, 2016
Event Code: 03E18100-2016-E-00174
Project Name: Regulating Works Len Small

Subject: 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:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service if they determine their project “may affect” listed species or critical habitat.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website http://ecos.fws.gov/ipac/ at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website http://www.fws.gov/midwest/endangered/section7/s7process/index.html. This website contains step-by-step instructions which will help you determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all wind energy projects and projects that include installing towers that use guy wires or are over 200 feet in height, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*) and Migratory Bird Treaty Act *(*16 U.S.C. 703 *et seq*), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Regulating Works Len Small

Official Species List

Provided by:

Marion Ecological Services Sub-Office
MARION ILLINOIS SUB-OFFICE
8588 ROUTE 148
MARION, IL 62959
(618) 997-3344
http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html

Consultation Code: 03E18100-2016-SLI-0184
Event Code: 03E18100-2016-E-00174

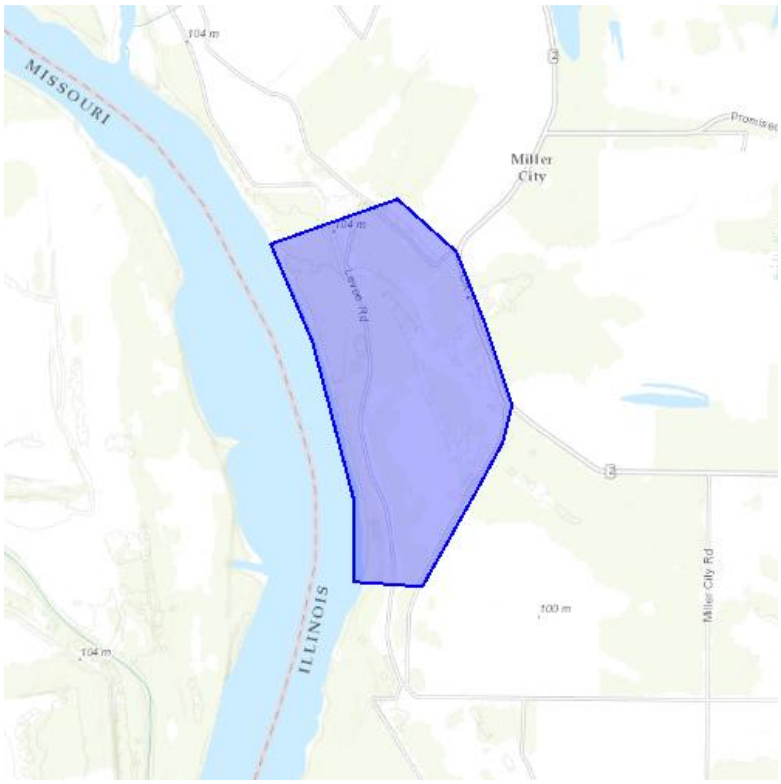
Project Type: STREAM / WATERBODY / CANALS / LEVEES / DIKES

Project Name: Regulating Works Len Small
Project Description: During the high water event of late December 2015-early January 2016, the Len Small levee near Miller City, IL sustained significant damage, most notably a nearly mile-long levee breach with associated floodplain scouring. Phase I of a repair at the site started on 26 January 2016 and consisted of re-establishing the bankline immediately adjacent to the breach with a notch remaining for access for potential future work. The bankline repair was performed using Operations and Maintenance (O&M) funds utilizing existing fiscal year (FY) 14 and 15 contracts and was completed on 16 February 2016. To date, the levee breach and associated scour have not been repaired and the threat of a channel cutoff exists. The Len Small Drainage and Levee District (D&LD) has submitted a letter requesting assistance through the Public Law 84-99 (PL 84-99) Program to repair the levee. Under PL 84-99, drainage districts whose levees are within the federal levee system can request federal assistance with flood damage repairs. Without federal involvement through the PL84-99 Program, it is unlikely that the D&LD has the financial capability to restore the level of protection according to Corps of Engineers standards. The request for the levee repair is being pursued in parallel to the proposed federal action under Regulating Works, which is intended to ensure the stability of the navigation channel. The purpose of this federal action is to reduce the risk of a channel cutoff forming through the Len Small D&LD and to maintain the navigation channel.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by'

section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-89.3792418755817 37.10139382070157, -89.36889655074428 37.104349870443826, -89.36417191420432 37.10093903357959, -89.3618503255597 37.09639101219828, -89.35969165541641 37.09096551534087, -89.36034332942194 37.088593768951554, -89.3626241884412 37.0853121892323, -89.36690079910238 37.079301006441646, -89.37248075777453 37.07952846527796, -89.37239929852382 37.084792321982945, -89.37590204630345 37.0950915273724, -89.3792418755817 37.10139382070157)))

Project Counties: Alexander, IL

Endangered Species Act Species List

There are a total of 7 threatened or endangered species on your 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. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	**Status**	**Has Critical Habitat**	**Condition(s)**
Least tern *(Sterna antillarum)* Population: interior pop.	Endangered		
Clams			
rabbitsfoot *(Quadrula cylindrica ssp. cylindrica)*	Threatened	Final designated	
Sheepnose Mussel *(Plethobasus cyphyus)*	Endangered		
Fishes			
Pallid sturgeon *(Scaphirhynchus albus)* Population: Entire	Endangered		
Mammals			
Gray bat *(Myotis grisescens)* Population: Entire	Endangered		
Indiana bat *(Myotis sodalis)* Population: Entire	Endangered		
Northern long-eared Bat *(Myotis*	Threatened		

septentrionalis)			

Critical habitats that lie within your project area

There are no critical habitats within your project area.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Marion Ecological Services Sub-Office
MARION ILLINOIS SUB-OFFICE, 8588 ROUTE 148
MARION, IL 62959
PHONE: (618)997-3344 FAX: (618)997-8961
URL: www.fws.gov/midwest/Endangered/section7/s7process/step1.html

Consultation Code: 03E18100-2016-SLI-0184 July 11, 2016
Event Code: 03E18100-2016-E-00279
Project Name: Regulating Works Len Small

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:

The attached species list identifies any federally threatened, endangered, proposed and candidate species that may occur within the boundary of your proposed project or may be affected by your proposed project. The list also includes designated critical habitat if present within your proposed project area or affected by your project. This list is provided to you as the initial step of the consultation process required under section 7(c) of the Endangered Species Act, also referred to as Section 7 Consultation.

Section 7 of the Endangered Species Act of 1973 requires that actions authorized, funded, or carried out by Federal agencies not jeopardize federally threatened or endangered species or adversely modify designated critical habitat. To fulfill this mandate, Federal agencies (or their designated non-federal representative) must consult with the Service if they determine their project “may affect” listed species or critical habitat.

Under 50 CFR 402.12(e) (the regulations that implement Section 7 of the Endangered Species Act) the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally. You may verify the list by visiting the ECOS-IPaC website http://ecos.fws.gov/ipac/ at regular intervals during project planning and implementation and completing the same process you used to receive the attached list. As an alternative, you may contact this Ecological Services Field Office for updates.

Please use the species list provided and visit the U.S. Fish and Wildlife Service's Region 3 Section 7 Technical Assistance website http://www.fws.gov/midwest/endangered/section7/s7process/index.html. This website contains step-by-step instructions which will help you determine if your project will have an adverse effect on listed species and will help lead you through the Section 7 process.

For all wind energy projects and projects that include installing towers that use guy wires or are over 200 feet in height, please contact this field office directly for assistance, even if no federally listed plants, animals or critical habitat are present within your proposed project or may be affected by your proposed project.

Although no longer protected under the Endangered Species Act, be aware that bald eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*) and Migratory Bird Treaty Act *(*16 U.S.C. 703 *et seq*), as are golden eagles. Projects affecting these species may require measures to avoid harming eagles or may require a permit. If your project is near an eagle nest or winter roost area, see our Eagle Permits website http://www.fws.gov/midwest/midwestbird/EaglePermits/index.html to help you determine if you can avoid impacting eagles or if a permit may be necessary.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Regulating Works Len Small

Official Species List

Provided by:

Marion Ecological Services Sub-Office
MARION ILLINOIS SUB-OFFICE
8588 ROUTE 148
MARION, IL 62959
(618) 997-3344
http://www.fws.gov/midwest/Endangered/section7/s7process/step1.html

Consultation Code: 03E18100-2016-SLI-0184
Event Code: 03E18100-2016-E-00279

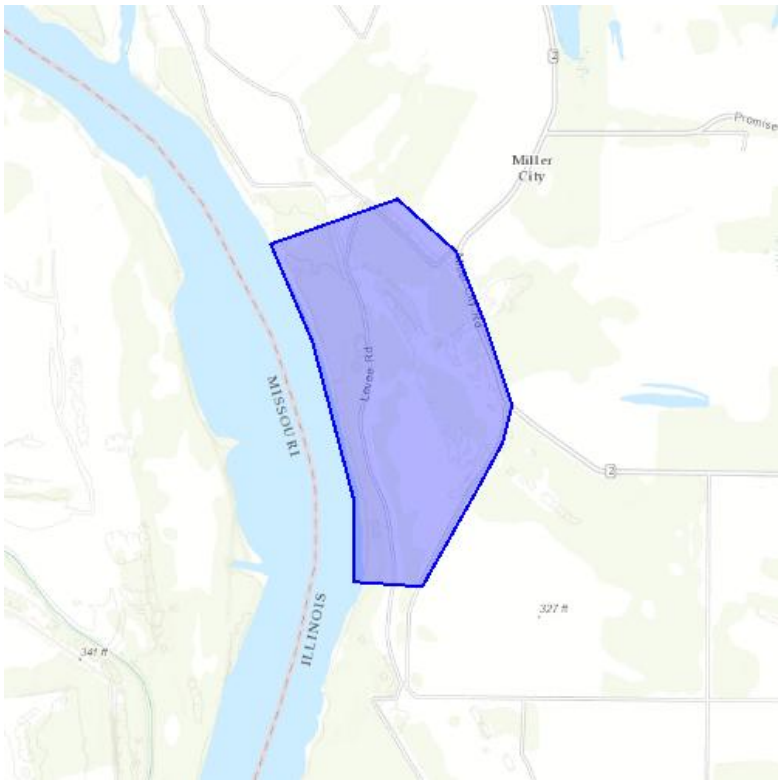
Project Type: STREAM / WATERBODY / CANALS / LEVEES / DIKES

Project Name: Regulating Works Len Small
Project Description: During the high water event of late December 2015-early January 2016, the Len Small levee near Miller City, IL sustained significant damage, most notably a nearly mile-long levee breach with associated floodplain scouring. Phase I of a repair at the site started on 26 January 2016 and consisted of re-establishing the bankline immediately adjacent to the breach with a notch remaining for access for potential future work. The bankline repair was performed using Operations and Maintenance (O&M) funds utilizing existing fiscal year (FY) 14 and 15 contracts and was completed on 16 February 2016. To date, the levee breach and associated scour have not been repaired and the threat of a channel cutoff exists. The Len Small Drainage and Levee District (D&LD) has submitted a letter requesting assistance through the Public Law 84-99 (PL 84-99) Program to repair the levee. Under PL 84-99, drainage districts whose levees are within the federal levee system can request federal assistance with flood damage repairs. Without federal involvement through the PL84-99 Program, it is unlikely that the D&LD has the financial capability to restore the level of protection according to Corps of Engineers standards. The request for the levee repair is being pursued in parallel to the proposed federal action under Regulating Works, which is intended to ensure the stability of the navigation channel. The purpose of this federal action is to reduce the risk of a channel cutoff forming through the Len Small D&LD and to maintain the navigation channel.

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by'

section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: MULTIPOLYGON (((-89.3792418755817 37.10139382070157, -89.36889655074428 37.104349870443826, -89.36417191420432 37.10093903357959, -89.3618503255597 37.09639101219828, -89.35969165541641 37.09096551534087, -89.36034332942194 37.088593768951554, -89.3626241884412 37.0853121892323, -89.36690079910238 37.079301006441646, -89.37248075777453 37.07952846527796, -89.37239929852382 37.084792321982945, -89.37590204630345 37.0950915273724, -89.3792418755817 37.10139382070157)))

Project Counties: Alexander, IL

Endangered Species Act Species List

There are a total of 7 threatened or endangered species on your 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. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	**Status**	**Has Critical Habitat**	**Condition(s)**
Least tern *(Sterna antillarum)* Population: interior pop.	Endangered		
Clams			
rabbitsfoot *(Quadrula cylindrica ssp. cylindrica)*	Threatened	Final designated	
Sheepnose Mussel *(Plethobasus cyphyus)*	Endangered		
Fishes			
Pallid sturgeon *(Scaphirhynchus albus)* Population: Entire	Endangered		
Mammals			
Gray bat *(Myotis grisescens)* Population: Entire	Endangered		
Indiana bat *(Myotis sodalis)* Population: Entire	Endangered		
Northern long-eared Bat *(Myotis*	Threatened		

septentrionalis)			

Critical habitats that lie within your project area

There are no critical habitats within your project area.

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Marion Illinois Sub-Office (ES)
8588 Route 148
Marion, Illinois 62959

FWS/MISO

July 8, 2016

Colonel Anthony P. Mitchell
U.S. Army Corps of Engineers
St. Louis District
1222 Spruce Street
St. Louis, Missouri 63103-2833

Attn: Dr. Kathryn McCain

Dear Colonel Mitchell:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (EA) and Unsigned Finding of No Significant Impact (FONSI) addressing the Dogtooth Bend Phase 6 Regulating Works Project located at approximate Upper Mississippi River Miles 33 to 34 in Alexander County, Illinois. The proposed project involves construction stabilizing the northern levee end, stabilizing the scour north of the bankline breach, establishing a stone blanket at the riverside toe of the northern intact levee section, and constructing a kicker dike to act as a false bankline to divert high flows away from the existing scour hole. Alternatives considered for this project included no action, a preferred phased approach alternative described above, and a non-phased alternative. These comments are prepared under the authority of and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.); the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq*.); and, the National Environmental Policy Act (83 Stat. 852, as amended P.L. 91-190, 42 U.S.C. 4321 et seq.).

Fish and Wildlife Resources

The purpose of constructing the proposed project is to stabilize the bankline and scour hole to ensure a safe and dependable navigation channel in the proposed work area. The Service has no objection to the proposed project and looks forward to additional coordination regarding Phase 3 (potential levee repair or grade control structure) of the proposed project.

Threatened and Endangered Species

The EA includes a Tier II Biological Assessment (BA) which was prepared in order to comply with the requirements of the 2000 Biological Opinion for Operation and Maintenance of the 9-

Foot Navigation Channel on the Upper Mississippi River System. The 2000 Biological Opinion (BO) was prepared as a result of the programmatic consultation under Section 7 of the Endangered Species Act of 1973, as amended, which evaluated the effects of operation and maintenance of the 9-foot navigation channel on federally listed threatened and endangered species. The BA evaluated the impacts of the proposed project on the endangered gray bat (*Myotis grisescens*), endangered Indiana bat (*Myotis sodalis*), endangered least tern (*Sterna antillarum*), endangered pallid sturgeon (*Scaphirynchus albus*), endangered sheepnose mussel (*Plethobasus cyphyus*), threatened northern long-eared bat (*Myotis septentrionalis*), and threatened rabbitsfoot mussel (Quadrula cylindrica cylindrica).

In the Tier II BA the Corps determined that the proposed project will have no effect on the gray bat, rabbitsfoot mussel, and sheepnose mussel. This precludes the need for further action on this project as required under Section 7 of the Endangered Species Act of 1973, as amended for these species. Information in the BA indicates that the proposed project will impact a minor amount of unsuitable forested habitats and that any tree clearing will occur outside the April 1 to September 30th restricted time period, thus the Corps has determined that the proposed project is not likely to adversely affect the Indiana bat and northern long-eared bat. Based on this information, the Service concurs that the proposed project is not likely to adversely affect the Indiana bat and northern long-eared bat. Information in the BA indicates that potential least tern habitat occurs in the project area and that work will occur during the winter to avoid impacts; thus the Corps has determined the proposed project is not likely to adversely affect the least tern. Based on this information, the Service concurs that the proposed project is not likely to adversely affect the least tern. Information in the BA indicates the construction activities will be primarily land based and dredging will occur within the landward side of the bankline; thus the Corps has determined the proposed project is not likely to adversely affect the pallid sturgeon. Based on this information, the Service concurs that the proposed project is not likely to adversely affect the pallid sturgeon. Should this project be modified or new information indicate listed or proposed species may be affected, consultation or additional coordination with this office, as appropriate, should be initiated.

Conclusion

The Service concurs with the FONSI for the proposed project. Thank you for the opportunity to provide comment on the EA and FONSI. For additional coordination, please contact me at (618) 997-3344, ext. 345.

Sincerely,

/s/ Matthew T. Mangan

Matthew T. Mangan
Fish and Wildlife Biologist

cc: IDNR (Atwood, Grider)
MDC (Sternberg)

From: Diane Hunter
To: Hayworth, Roberta L MVS
Subject: [EXTERNAL] Dogtooth Bend Phase 6; phase 2 Len Small Levee District
Date: Thursday, June 30, 2016 3:44:14 PM

Dear Ms. Hayworth:

Aya, kikwehsitoole. My name is Diane Hunter, and I am the Tribal Historic Preservation Officer for the Federally Recognized Miami Tribe of Oklahoma. In this capacity, I am the Miami Tribe's point of contact for all Section 106 issues.

The Miami Tribe offers no objection to the above-mentioned project at this time, as we are not currently aware of existing documentation directly linking a specific Miami cultural or historic site to the project site. However, as this site is within the aboriginal homelands of the Miami Tribe, if any human remains or Native American cultural items falling under the Native American Graves Protection and Repatriation Act (NAGPRA) or archaeological evidence is discovered during any phase of this project, the Miami Tribe requests immediate consultation with the entity of jurisdiction for the location of discovery. In such a case, please contact me at 918-541-8966, or by email at dhunter@miamination.com <mailto:dhunter@miamination.com> to initiate consultation.

The Miami Tribe requests to serve as an interested party to the proposed project. In my capacity as Tribal Historic Preservation Officer I am the point of contact for consultation.

Respectfully,

Diane Hunter
Tribal Historic Preservation Officer
Miami Tribe of Oklahoma
P.O. Box 1326
Miami, OK 74355

QUAPAW TRIBE OF OKLAHOMA

P.O. Box 765
Quapaw, OK 74363-0765

(918) 542-1853
FAX (918) 542-4694

June 23, 2016

Ms. Roberta Hayworth
Engineering and Construction Division
St. Louis District Corps of Engineers
1222 Spruce Street
St. Louis, Missouri 63103-2833

Re: The Dogtooth Bend Phase 6, Alexander County, Illinois

Dear Roberta,

The Quapaw Tribe Historic Preservation Office has received notification of the proposed project listed as the DogTooth Bend Phase 6, Alexander County, Illinois.

In accordance with the National Historic Preservation Act, (NHPA) [16 U.S C. 470 §§ 470-470w-6] 1966, undertakings subject to the review process are referred to in S101 (d) (6) (A), which clarifies that historic properties may have religious and cultural significance to Indian tribes. Additionally, Section 106 of NHPA requires Federal agencies to consider the effects of their actions on historic properties (36 CFR Part 800) as does the National Environmental Policy Act (43 U.S.C. 4321 and 4331-35 and 40 CFR 1501.7(a) of 1969).

The Quapaw Tribe has a vital interest in protecting its historic and ancestral cultural resources. The Quapaw Tribe requests a copy of all SHPO correspondence received for the project listed as the Dogtooth Bend Phase 6, Alexander County, Illinois.

Please contact the Quapaw Tribe Historic Preservation Office with your response to this request. Should you have any questions or need any additional information, please feel free to contact me at the number listed below. Thank you for consulting with the Quapaw Tribe on this matter.

Sincerely,

Everett Bandy

Everett Bandy
Tribal Historic Preservation Officer
Quapaw Tribe of Oklahoma
P.O. Box 765
Quapaw, OK 74363
(w) 918-238-3100

From: karen pritchett
To: Hayworth, Roberta L MVS
Cc: Eric Oosahwee-voss; karen pritchett
Subject: [EXTERNAL] Dogtooth Bend Phase 2
Date: Friday, June 24, 2016 9:35:45 AM

Dear Roberta,

On behalf of Tribal Historic Preservation Officer (THPO) Eric Oosahwee-Voss, please accept this digital communication regarding the planning of a bankline and levee stabilization and the construction of a kicker dike at approximately river mile 33.3 on the Mississippi River.

Please be advised that the proposed undertaking lies within the traditional territory of the United Keetoowah Band of Cherokee Indians in Oklahoma (UKB). This opinion is being provided by UKB THPO, pursuant to authority vested by the UKB Corporate Board and under resolution 16-UKB-34. The United Keetoowah Band is a Federally Recognized Indian Nation headquartered in Tahlequah, OK.

We agree with the report findings that the project will result in a finding of no effect on historic properties. As the project moves forward we request the following conditions be followed:

Condition 1: Inadvertent Discoveries - In the event that human remains, burials, funerary items, sacred objects, or objects of cultural patrimony are found during project implementation, the proponent or his/her authorized agent shall cease work immediately within 200 ft of the find. They shall take steps to protect the find from further damage or disruption. They shall contact the THPO at (918) 458-6717 [desk] or (918) 207-7182 [cell] to report the find. The THPO shall contact the appropriate law enforcement authority if human remains are found. No further work shall be allowed on the project until the THPO has approved a plan for managing or preserving the remains or items.

Condition 2: Post Review Discoveries - In the event that pre-contact artifacts (i.e., arrowheads, spear points, mortars, pestles, other ground stone tools, knives, scrapers, pottery or flakes from the manufacture of tools, fire pits, culturally modified trees, etc.) or historic period artifacts or features (i.e., fragments of old plates or ceramic vessels, weathered glass, dumps of old cans, cabins, root cellars, etc.) are found during project implementation, the proponent or his/her authorized agent shall cease work immediately within 200 ft of the find. They then shall contact the THPO at (918) 458-6717 [desk] or (918) 207-7182 [cell] to report the find. No further work shall be allowed on the project until the THPO has approved a work plan for managing or preserving the artifacts or features.

Condition 3: Activities that have the potential to disturb cultural resources outside the areas specified in the accompanying document(s) are not approved and will not proceed until cultural resources review of potential adverse effects in the new area has been completed.

Thank you for consulting with the UKB. Please note that these comments are based on information available to us at the time of the project review. We reserve the right to revise our comments as information becomes available. If you

have any questions or concerns, please contact me at (918) 458-6715 or kpritchett@unitedkeetoowahband.org <mailto:kpritchett@unitedkeetoowahband.org> or THPO Eric Oosahwee-Voss at (918) 458-6717 or eoosahwee-voss@unitedkeetoowahband.org <mailto:eoosahwee-voss@unitedkeetoowahband.org> .

UKB#

U16-278

16.0284

Thank you,

Karen Pritchett

THPO Assistant

Tribal Historic Preservation Office

United Keetoowah Band of Cherokee Indians in Oklahoma

P. O. Box 1245

Tahlequah, OK 74465

918-458-6715

Illinois Department of
Natural Resources
One Natural Resources Way Springfield, Illinois 62702-1271
www.dnr.illinois.gov
Bruce Rauner, Governor
Wayne A. Rosenthal, Director

July 11, 2016

Kathryn McCain
Chief Environmental Planning Section
U.S. Army Corps of Engineers
1222 Spruce St.
St. Louis MO 63103-2833

RE: Regulating Works Dogtooth Bend Phase 6
Project Number(s): 1611273
County: Alexander

Dear Ms. McCain:

The Illinois Department of Natural Resources (Department) has reviewed this project proposed by the US Army Corps of Engineers (USACE). The project involves stabilizing and armoring a failed bankline, stabilizing and armoring a scour hole, and constructing a kicker dike to divert flows. The project will require building haul roads and dredge spoil placement. The project is located at Mississippi River Miles 34–33 in Alexander County, Illinois. Pursuant to the Fish & Wildlife Coordination Act, the Department provides the following comments:

The Bumgard Island Illinois Natural Area Inventory Site occurs approximately one mile downstream of the project area. This site is not likely to be adversely affected by the proposed project.

Records occur in the project area for the state and federally-endangered Indiana bat (*Myotis sodalis*). The state and federally-endangered gray bat (*Myotis grisescens*) and state and federally-threatened northern long-eared bat (*Myotis septentrionalis*) may also occur in the project area. The Department concurs with the USACE's plan to only clear trees from October 1 through March 31 to avoid impacts to these species.

Records occur in the project area for the state-threatened Illinois chorus frog (*Pseudacris illinoensis*). Specifically, the work proposed at the north levee cap has the highest potential to "take" this species given the close proximity of known records for breeding males. However, given the recent levee breach and scouring of the area, it is possible that the frogs have been displaced and it may take some time for them to recolonize the area. This is based on observations by our field biologists during previous flood events elsewhere. Regardless, the Department recommends avoidance measures be implemented in the project area given the scope of the work, abundant records in the vicinity, and habitat types are present which are conducive to this species. The Department recommends work be avoided during the breeding season from

February 1st Through May 31st, particularly at the north levee cap area. Please coordinate further with our District Heritage Biologists Scott Ballard (618)993-7023 and Mark Guetersloh (618)634-2545 and arrange a site visit if necessary to discuss project details.

Records also occur in the vicinity for the state-endangered shrimp crayfish (*Orconectes lancifer*). This record occurs at Horseshoe Lake, State Conservation Area approximately two miles northeast of the project area. Records indicate that this species is known to only occur at Horseshoe Lake; therefore, impacts to this species are unlikely.

Thank you for the opportunity to comment and we look forward to future coordination. Please contact me if you have any questions regarding this review.

Sincerely,

Nathan Grider
Biologist
Impact Assessment Section
217-785-5500

cc: Scott Ballard – IDNR, DNH
Mark Guetersloh – IDNR, DNH
Butch Atwood – IDNR, Fisheries
Matt Mangan – USFWS

Appendix C

DISTRIBUTION LIST

REGULATING WORKS PROJECT

DOGTOOTH BEND

PHASE 6

RM 34-33

ALEXANDER COUNTY, ILLINOIS

ON THE

MIDDLE MISSISSIPPI RIVER SYSTEM

REGIONAL PLANNING AND ENVIRONMENTAL DIVISION (CEMVP-PD-P)

U.S. ARMY CORPS OF ENGINEERS

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