U.S. Army Corps
Of Engineers
St. Louis District

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Burnham Island Sandbar Creation Project
Middle Mississippi River (RM 38.9 – 39.4 R)
Scott County, Missouri

FINAL ENVIRONMENTAL ASSESSMENT
WITH FINDING OF NO SIGNIFICANT IMPACT

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Chapter 1 Purpose and Need for Action

1.1 Introduction

The U.S. Army Corps of Engineers (Corps), Mississippi Valley Division (MVD), St. Louis District (District), has prepared this Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) to evaluate the potential impacts associated with the Burnham Island Sandbar Creation Project. The project area is located along the right descending bank of the Middle Mississippi River (MMR) between river miles (RM) 38.9 – 39.4, approximately 38.9 miles upstream of the confluence with the Ohio River. The project area is located in Scott County, Missouri, approximately 11 miles southeast of Cape Girardeau, Missouri (Figures 1-2).

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality's Regulations (40 Code of Federal Regulations §1500-1508), as reflected in the USACE Engineering Regulation 200-2-2.

1.2 Authority

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, 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 reach between the confluences of the Ohio and Missouri rivers (RM 0-195), known as the Middle Mississippi River (MMR)[1]. This ongoing effort is also commonly referred to as the Regulating Works Project. The Regulating Works Project utilizes bank stabilization and sediment management to maintain bank stability and ensure adequate navigation depth and width. Bank stabilization is achieved by revetments and river training structures, while sediment management is achieved by river training structures (also referred to as regulating works structures). Other activities performed to obtain authorized channel dimensions of the

[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.

navigation channel are rock relocation and channel maintenance dredging. The Regulating Works 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 Regulating Works Project, as authorized by Congress, is to reduce the amount of annual maintenance dredging.

In performing this responsibility, the Corps is committed to complying with the Endangered Species Act (ESA). In executing responsibilities under the ESA, the Corps recognizes that there is to be deference to the U.S. Fish and Wildlife Service (Service). It is incumbent upon the Service to provide biological advice and guidance that allows the Corps to achieve compliance with the ESA within the Corps' statutory authorities and appropriations. Through implementation of the proposed federal action described herein, the District would remain in compliance with the ESA for the Regulating Works Project.

1.3 Need for Action

Through a voluntary formal consultation process between the Corps and the Service, a Biological Opinion for the Operation and Maintenance of the 9-foot Navigation Channel on the Upper Mississippi River System (UMRS) was submitted to the Corps from the Service on May 15, 2000 (USFWS 2000; hereinafter also referred to as the Service's Biological Opinion). The Upper Mississippi River System was defined in the Biological Opinion as the commercially navigable portions of the Mississippi (Upper River Miles 0-854), Illinois (River Miles 0-327), Kaskaskia, Minnesota, St. Croix, and Black rivers (UMRS). There are multiple Corps authorized projects for the 9-foot navigation channel within the UMRS, including the Regulating Works Project.

After continued discussions, the Corps submitted a letter to the Service on August 11, 2000. This letter described how the Corps proposed to proceed with the future operation and maintenance of the 9-foot channel navigation projects for the UMRS in light of its ESA obligations and the information provided to the Corps in the Service's Biological Opinion of May 15, 2000.

The Service's Biological Opinion provided a number of requirements under a "Reasonable and Prudent Alternative" to avoid the likelihood of jeopardizing the continued existence of the federally endangered pallid sturgeon (*Scaphirhynchus albus*). One such requirement was to implement aquatic habitat restoration measures in the MMR that are expected to benefit the pallid sturgeon, such as using dredge disposal material to improve habitat diversity. Further, the Service's Biological Opinion provided "Reasonable and Prudent Measures" to minimize the incidental take of the federally endangered least tern (*Sterna antillarum*), such as using dredge disposal material in the MMR to restore sandbar habitat. The proposed project is being conducted in accordance with the Reasonable and Prudent Alternative and the Reasonable and Prudent Measures of the Service's Biological Opinion for these two species.

1.4 Proposed Federal Action

The proposed Federal action is implementation of an ephemeral island/sandbar creation project near Burnham Island in the MMR. The goal of the proposed project is to enhance aquatic habitat for the federally endangered pallid sturgeon, which could also have the potential to serve as breeding habitat for the least tern, depending on river stages. The proposed project consists of using dredge disposal material to build ephemeral sandbar habitat in the MMR. Specifically, sediment would be dredged from within the navigation channel using a hydraulic dredge and deposited via flexible-floating dredge pipe (flex-pipe) between the river training structures on the right descending bank between river miles 38.9 – 39.4. The dredged material would be concentrated in specific areas in order to build the islands to a specific design elevation and size, increasing the wetted edge, wetted perimeter and the overall bathymetric diversity in the area.

1.5 Scoping

Scoping is an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action. Scoping was conducted early in the planning process using a variety of communication methods with affected public, agencies, organizations, and tribes. The input received during scoping was incorporated in the process of decision making for this project; however, the District must ultimately make the decision what direction the project will follow.

1.5.1 Tribal Scoping

The United States government has a unique legal relationship with federally recognized American Indian Tribes, based on the inherent powers of Tribal sovereignty and self-government. The District will uphold this special relationship and implement its activities in a manner consistent with it. Communication with 28 federally recognized tribes affiliated with the St. Louis District was initiated by the District's tribal liaison with a Corps letter dated 17 January, 2017 (Appendix A). All responses to this coordination received by the District have been included in this Final EA (Appendix A).

1.5.2 Public Scoping

Public scoping activities were held prior to the development of this Final EA. This environmental assessment was made available to the public for a 30-day public review period. The report was made available on the District's website along with letters mailed to interested members of the public addressing where to find the report and how to provide comments.

1.5.3 Agencies and Organization Scoping

The District began initial planning for the Burnham Island Sandbar Creation project in 2013. The details of the project, including the project location, were developed through a collaborative effort with the Service, the Missouri Department of Conservation, and the Illinois Department of Natural Resources. These agencies provided input on the project objectives, potential features, project location, and project monitoring. All of the aforementioned agencies are in full support of the proposed project.

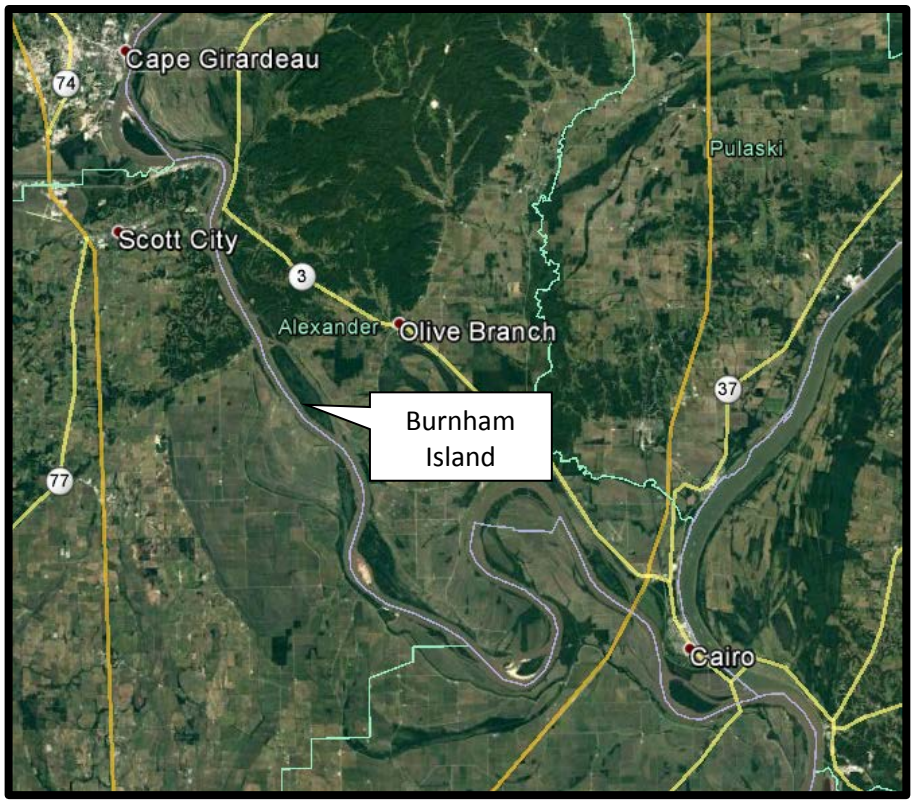

Figure 1. Burnham Island vicinity.

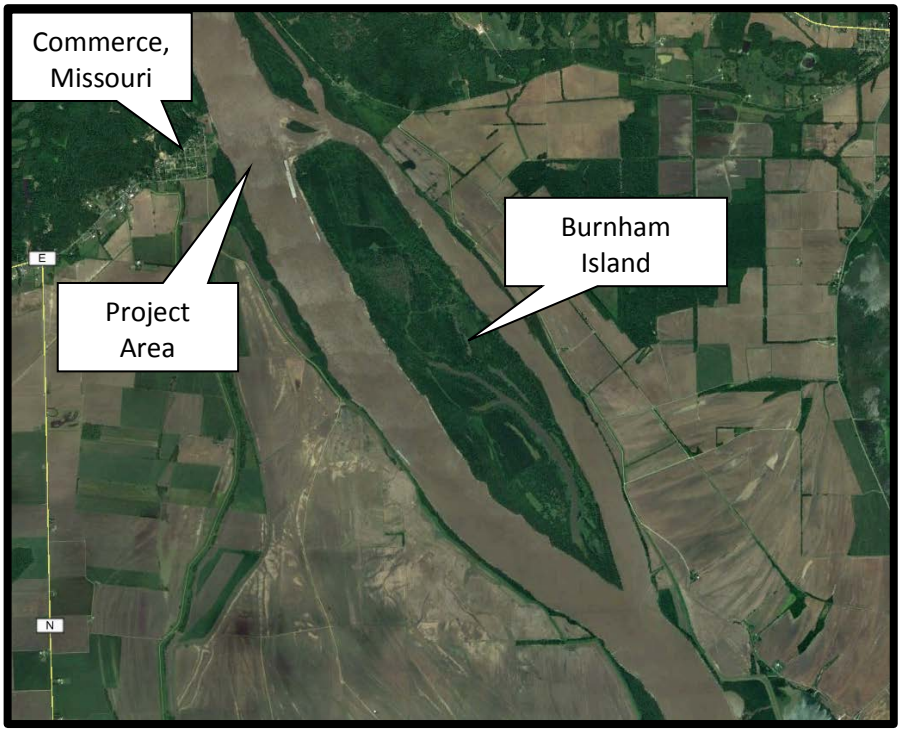

Figure 2. Project location, Scott County, Missouri.

Chapter 2 Alternatives Including the Proposed Action

This chapter presents the alternatives considered for implementation of the Burnham Island Sandbar Creation Project. It describes the No Action Alternative and one action alternative in detail and provides a summary comparison.

2.1 Alternative Development

NEPA requires agencies to evaluate a range of reasonable alternatives to a proposed Federal action. The alternatives were developed to meet the purpose and need of the proposal, while minimizing and avoiding environmental impacts. The proposed action alternative was developed from input provided through scoping. With the assistance of technical experts from the aforementioned agencies and organizations, the District developed Alternative 2, described below.

The District and collaborating agencies evaluated various potential project locations throughout the MMR to use dredge disposal material to enhance aquatic habitat diversity. Ultimately, the selected project location was chosen because of its relatively unique configuration of river training structures (i.e., offset dikes), and its continued need for channel maintenance dredging. Offset dikes consist of traditional dikes that protrude from the bank toward the navigation channel, but have an additional disconnected dike segment located just upstream and riverward from the traditional dike structure. These structures help to maintain operational depths of the navigation channel while simultaneously allowing secondary flow through the disconnected portion of the dike structure. The secondary flow produces scour holes and depositional areas downstream of these dike structures, enhancing the overall bathymetric diversity of the area.

Furthermore, since 2011 the District has dredged within the vicinity of the project area seven times. This resulted in approximately 960 thousand cubic yards of sediment being dredged, yielding an average of 137 thousand cubic yards of sediment per dredging event. Dredge disposal was most often completed via the traditional side-casting method, with a rigid pipe to deposit the material parallel to the dredge cuts (Figure 3).

Therefore, the area was selected because it presented a unique opportunity to enhance the depositional areas that resulted from the construction of the offset dikes, and because of the high likelihood that channel maintenance dredging would be necessary in the future at this location regardless of this project. Lastly, the outer segments of the offset dikes would act as armoring structures as well, increasing the longevity of the created sandbar habitat.

2.2 Alternatives Considered in Detail

Based on planning and coordination with the resource partners, two alternatives were considered for further detailed analysis. The two alternatives are summarized as follows:

- Alternative 1 (No Action Alternative): If implemented, the District's flex-pipe would not be used to create sandbar habitat downstream of the offset dikes near Burnham Island.

The current bathymetry in the area would remain relatively unchanged until future channel maintenance dredging is completed or the local configuration of river training structures is modified.

- Alternative 2 (Environmental Dredging): If implemented, the District would hydraulically dredge within the navigation channel adjacent to the offset dikes, and use the dredge disposal material to enhance the depositional areas near Burnham Island, increase their overall elevation, improve bathymetric diversity, and provide new sandbar habitat.

The existing conditions and impacts of each alternative on environmental resources are compared and described in Chapter 3, *Affected Environment* and Chapter 4, *Environmental Consequences.*

2.3 Details of Preferred Alternative

The preferred alternative is Alternative 2 – Environmental Dredging. The proposed action includes the creation of sandbar habitat immediately downstream of the offset dikes located on the right descending bank of the MMR between river miles 38.9 – 39.4. The District would hydraulically dredge within the navigation channel adjacent to the offset dikes, and using the District's flex-pipe, dredge disposal material would be concentrated in circular/tear-drop shaped areas between the offset dikes near Burnham Island, increasing the elevation of depositional areas and ultimately creating new sandbar habitat. Specifically, three depositional areas totaling approximately 350,000 ft^2 would be brought to a target elevation of +16 low water reference plane (LWRP). The required volume of dredge disposal material is estimated to be approximately 280,000 yd^3. The proposed project would be performed during a single dredging event. The District's dredge, the Potter, is not anticipated to be mobilized and on site more than once.

During the development of the preferred alternative, the District and the aforementioned agencies decided to match the target elevation of the sandbars with the design elevation of the offset dikes (+16 LWRP). This target elevation was selected because it would allow the offset dikes to function as armoring for the created sandbars, helping to ensure the sandbars remain for the duration of the monitoring period. The District anticipates the effects of the proposed action (i.e., increased elevation) to last for a minimum of two years. This is based on previous environmental dredging projects implemented by the District on the MMR, the results of which demonstrate that sandbars created with the flex-pipe can last beyond a single high-water event and for multiple years. Further, building to this elevation would result in the sandbars being submerged during much of the year, which would facilitate the monitoring protocol that has been developed for the proposed project (Section 2.4).

However, the likelihood of building to the desired elevation at the three depositional areas is heavily dependent on a number of variables. These variables include: the river stage once the dredge is mobilized and on site, the current bed elevation of the disposal areas, the current bed elevation within the navigation channel, and the ability of the spill barge to accurately maneuver between the three disposal areas. For example, based on multi-beam bathymetric surveys conducted by the District in 2015, elevations of the proposed disposal areas range

between -10 and -2 LWRP (Figure 4), meaning the deepest areas would need to be increased by 26 feet in elevation in order to reach the target elevation. Due to the uncertainties listed above, and the District's inability to control or predict these conditions, it is possible the target elevation would not be reached. Regardless of the final elevation after project implementation, the bathymetric diversity would be enhanced through the creation of sandbar habitat, providing habitat for the endangered pallid sturgeon, and possibly providing nesting habitat for least tern as well. Therefore, the District has decided to accept the risks and uncertainties associated with the preferred alternative, and proceed as such.

2.4 Project Monitoring

In order to determine the physical characteristics of the created sandbar habitat and how changes to the habitat occur over time, as well as usage of the habitat by pallid sturgeon and its prey species, pre- and post-construction monitoring of the project would be conducted. A monitoring protocol for both the physical and biological components of the project has been developed, and is summarized herein.

2.4.1 Physical Monitoring

Physical monitoring of the created sandbars would include fine scale multi-beam bathymetric surveys and acoustic Doppler current profile (ADCP) surveys. An initial survey (bathymetry and ADCP) would be conducted just prior to construction in order to provide a baseline against which post-construction data would be compared. This would be followed by a post-construction survey to gauge the immediate effects to the physical environment and aquatic habitat. These surveys would be used to detect changes in footprint size, location, shape, elevation, and rates of erosion. Annual post-construction surveys would continue until the site returns to pre-construction conditions or until the conditions become stabilized and a new baseline is established.

The ability to adequately perform post-construction surveys is dependent on the sandbars and off-set dikes being inundated, allowing survey vessels to maneuver safely above these features. Therefore, a schedule of post-construction surveys has not been established, rather, survey dates would be dictated by river stages.

2.4.2 Biological Monitoring

A fish sampling protocol was developed which includes deploying a mini-Missouri trawl and trawling at transects between the off-set dikes, parallel with the flow of the river. These data would be used to examine changes in relative abundance of *Scaphirhynchus spp.* and suspected pallid sturgeon prey species; sturgeon chub (*Macrhybopsis gelida*) and sicklefin chub (*Macrhybopsis meeki*). Two years of pre-construction trawling data have already been collected, and post-construction trawling would begin after project construction. An equal number of post-construction trawls would be performed over the course of two years after construction. Similar to the physical monitoring component, the ability to trawl over the created sandbars is dependent on river stage. Therefore, a schedule of post-construction trawling has not been established, rather, survey dates would be dictated by river stages.

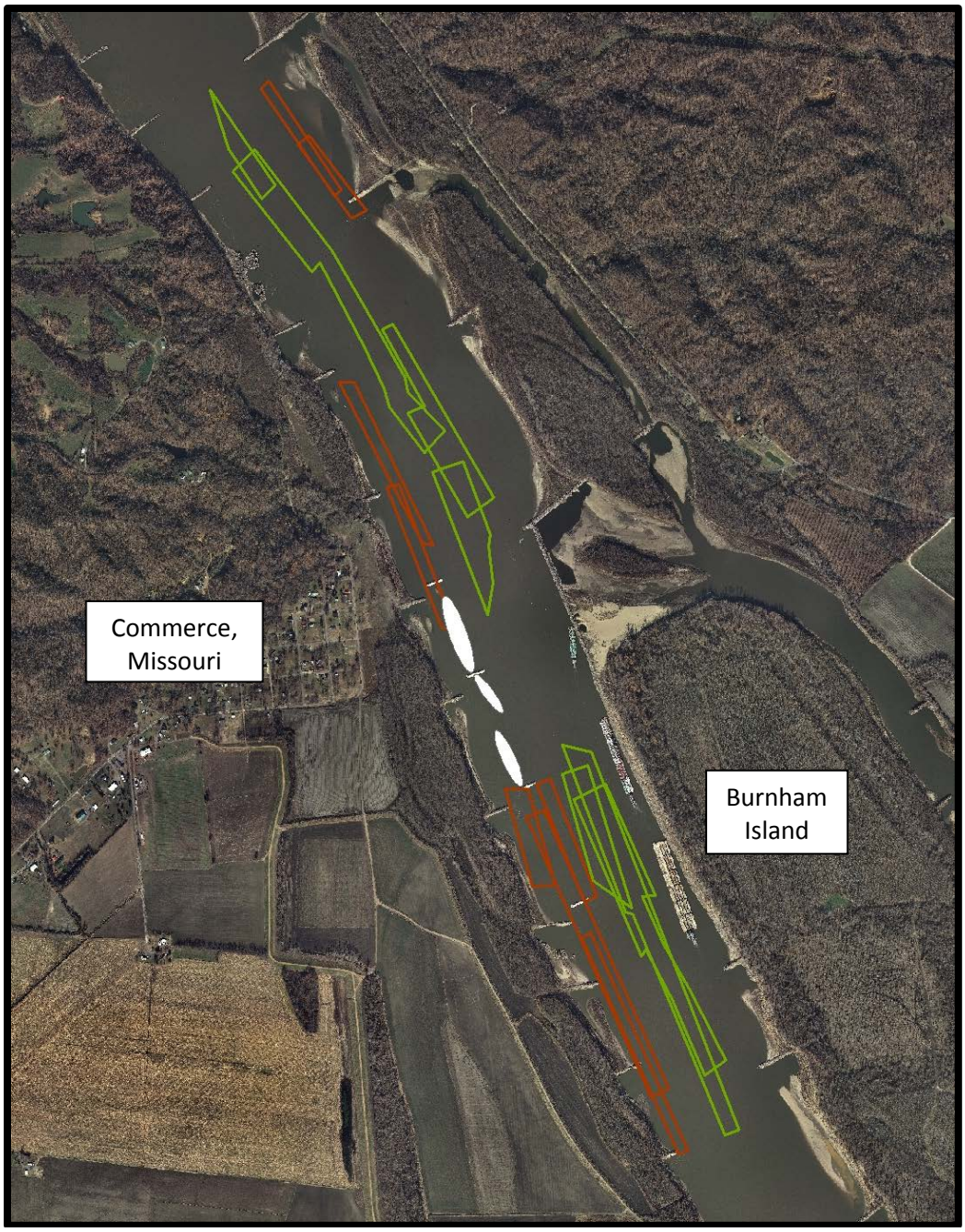

Figure 3. Approximate location of channel maintenance dredging (green) and dredge disposal locations (red) performed in the Burnham Island vicinity since the year 2011, and the proposed location for dredge disposal and sandbar creation (white).

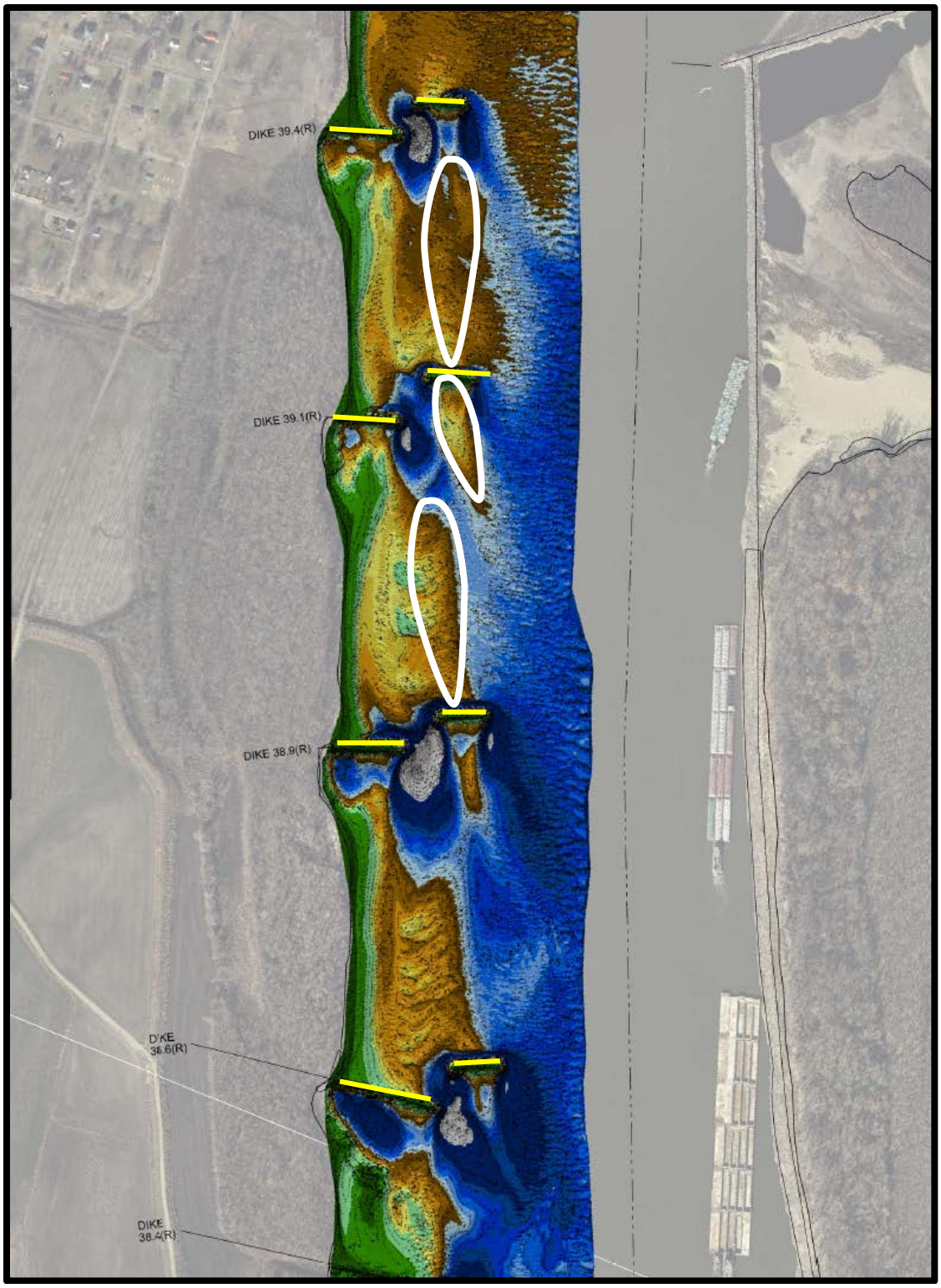

Figure 4. Results of bathymetric surveys performed at the project area in 2015, off-set dikes (yellow), and the proposed location for dredge disposal and sandbar creation (white).

Chapter 3 Affected Environment

Chapter 3 is organized by resource topic. This chapter describes the historic and existing conditions of resources to be affected by the alternatives under consideration. This is not a comprehensive discussion of every resource within the study area, but rather focuses on those aspects of the environment that were identified as issues during scoping or may be affected by the alternatives. The impacts of each alternative are described in Chapter 4, *Environmental Consequences.*

3.1 Physical Setting

The Burnham Island project area consists of a segment of structured main channel border on the right descending bank of the MMR between river miles 38.9 – 39.4, immediately downstream from the city of Commerce, Missouri, and the city's public boat ramp. It is opposite of the closed entrance to Santa Fe Chute, a relatively large closed side channel, located on the left descending bank. Structures within the project area vicinity consist of traditional rock dikes, bankline revetment, and four sets of the more modern off-set dike structures (Figure 5). The off-set segment of these dikes were added to the already present dike structures in the year 2012. These structures were built to help alleviate the reoccurring channel maintenance dredging that is often required immediately downstream. The off-set structures were used in lieu of simply extending the traditional dike structures because of the added environmental benefit of enhancing the bathymetric diversity in the immediate area. As demonstrated by multibeam bathymetric surveys conducted in 2015, the off-set dikes have successfully served this purpose, and have resulted in the formation of multiple depositional areas and scour holes immediately downstream (Figure 4).

The project area lies within a stretch of the MMR that is relatively linear, flowing from north/northwest to south/southeast. The main channel in the area is typical of those areas in the MMR, with characteristic rolling sand waves and high velocity current. The main channel in this area has been dredged repeatedly for navigation purposes, and sediment has been disposed using the traditional side-cast method within the dike field on the right descending bank between RM 38 - 40 (Figure 3).

The riparian zone on the right descending bank is well vegetated, and is characteristic of riverfront forests along the MMR, likely dominated by tree species such eastern cottonwood (*Populus deltoides*), sycamore (*Planatus occidentalis*), silver maple (*Acer saccharinum*) and willows (*Salix spp*). It should be noted that this project is confined strictly to aquatic areas. Although directly adjacent to land, no work would be conducted on any terrestrial habitat, and therefore, there are no anticipated terrestrial impacts associated with the proposed project. As such, a more detailed description of terrestrial resources (e.g., habitat, soils, wildlife) is not included in this report.

Figure 5. Off-set dikes at RM 39(R) during low-water fly-over September 2012.

3.2 Stages

Figure 6 displays the average annual hydrograph (data from 2005-2014) from the Thebes rated gage, compared to the approximate elevation of the offset dikes (+16 LWRP), which is the target elevation for the sandbar habitat. The Thebes gage is located approximately 5 miles upstream of the project area, and is the gage closest to the project area. This ten year average annual hydrograph demonstrates that during the period of March through July, the water level is typically above the offset dikes in the project area.

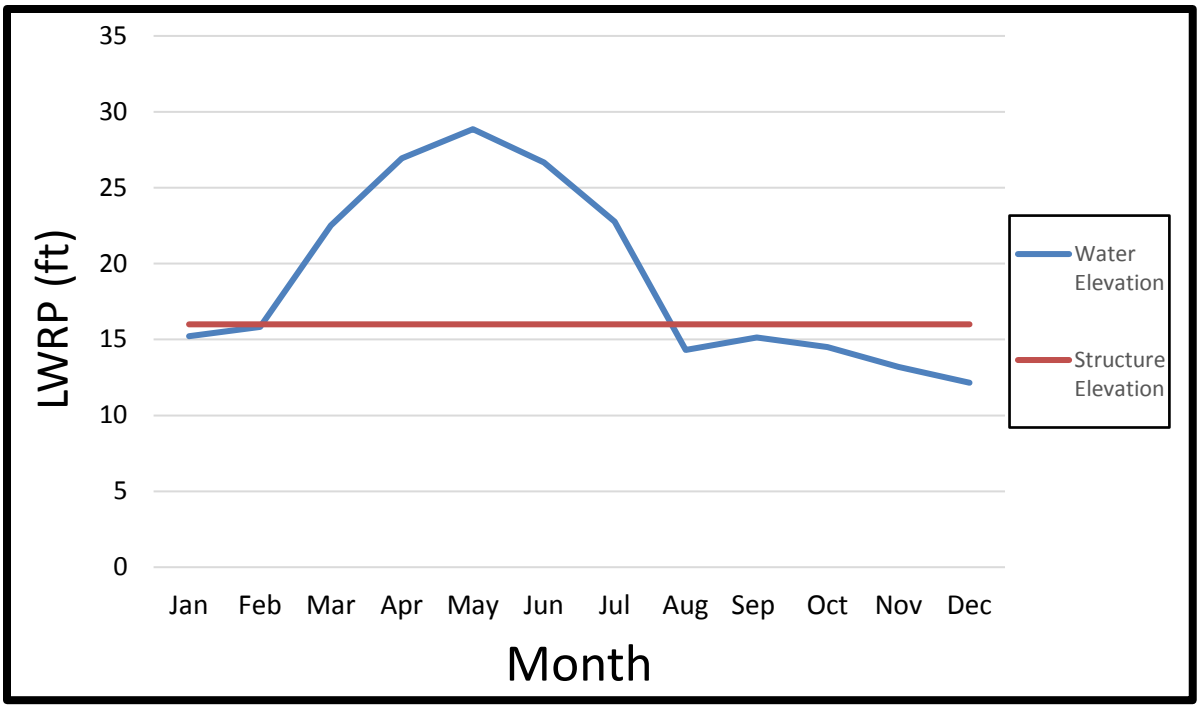

Figure 6. Monthly average annual hydrograph (data from 2005-2014) from The Thebes rated gage, compared to height of the off-set dikes in the project area (+16 LWRP), which is the target elevation for the sandbar habitat.

3.3 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. The Mississippi River is on the 2016 303(d) list for Missouri between St Louis, MO, and Ste. Genevieve, MO (MDNR 2016); however, the Mississippi River in the vicinity of the work area is not listed as impaired by the state of Missouri.

Missouri has fish consumption advisories for the Mississippi River for shovelnose sturgeon (all sizes, 1 per month), flathead catfish (>17", 1 per week), blue catfish (>17", 1 per week), channel catfish (>17", 1 per week), common carp (>21", 1 per week), and sturgeon eggs (do not eat) due to PCB, chlordane, and mercury contamination (MDHSS 2016).

In regards to the specific project area, water quality data were not collected for the purposes of this project. However, The Upper Mississippi River Restoration Program's Long Term Resource Monitoring element (UMRR-LTRM) began collecting water quality samples annually from the MMR in 1991, and has continued collecting samples to date. See Soballe and Fischer (2004) for a detailed description of the program's water quality sampling protocol. Through a standardized random sampling protocol, a total of 108 water quality samples have been taken

from the main channel within 0.25 miles of the proposed sandbar sites. The averages of these data for some common water quality parameters are displayed in Table 1.

Table 1. Mean and standard error (SE) of the UMRR-LTRM water quality samples collected from 1991 to 2015 within the vicinity (0.25 mile radius) of the proposed sandbar creation sites. Data were averaged across seasons and years.

	SECCHI (cm)	DO (mg/L)	PH	TURB (NTU)	COND (µS/cm)
Mean	22.21	8.28	7.55	98.31	514.60
± SE	1.19	0.27	0.15	8.54	12.85

3.4 Fisheries and Aquatic Habitat

There is a variety of aquatic habitat within the work area. Habitat types in the area can be categorized using common Mississippi River habitat classifications (see Barko et al. 2004, Phelps et al. 2010). Habitat types in the area include the main channel, unstructured main-channel borders, structured main-channel borders, and a closed side-channel. Because of this, the project area likely fulfills the habitat requirements for the major habitat guilds of large river fishes: fluvial specialists, fluvial dependents, and macrohabitat generalists. Fluvial specialists are species found almost exclusively in lotic (flowing water) habitat, and require flowing water for all of their life cycles (Kinsolving and Bain 1993). Fluvial dependent species occur in both lentic (non-flowing water) and lotic habitats, but require flowing water during one or more life stages (e.g., reproduction; Galat et al. 2005). Macrohabitat generalist species are also commonly found in both lentic and lotic habitats, but do not require flowing water for any particular life stage (Kinsolving and Bain 1993). Stretches of unstructured main-channel and main channel border areas provide the preferred habitat of MMR fluvial specialists and fluvial dependents: moderate depths of flowing water over a sandy substrate. Main channel border wing dike areas produce pockets of lentic habitat in the form of flow refugia and plunge pools, providing habitat often used by macrohabitat generalists. Side channels provide arguably the most important habitat type in the MMR, as they create lateral connectivity and are likely used as surrogates for floodplain and backwater habitat by many species in the MMR. Data collected by the UMRR-LTRM component in the MMR demonstrates that most macrohabitat generalists are collected in greater relative abundance from side channels compared to other macrohabitat types, such as main channel border habitat, presumably due to the shallow, low-velocity habitat they provide at certain river stages (Simmons 2015).

UMRR-LTRM fish community monitoring conducted in the MMR between river miles 29 to 80 from 2000 to 2014 resulted in 99 fish species being collected. The most commonly encountered native and non-native species can be found in Table 2 below. Due to the fact that the proposed project areas is located within the UMRR-LTRM sampling reach described above, it is likely that this list is representative of the fish assemblage in the project area.

Regarding freshwater mussels, surveys conducted by Keevin et al. (2013) on the MMR demonstrate that mussel abundance and diversity is extremely low in main channel border habitat, and that no true mussel beds are known to exist in the MMR. They attribute this to unstable sand substrate, the continuous downstream movement of sand waves, and the high level of turbidity that enters the MMR from the Missouri river. Past surveys also suggest that side channels in the MMR are more supportive to mussel populations than are main channel areas, although densities are also very low in the side channels and the fauna is typically composed of species that occur in backwater habitats (Keevin and Cummings 2000). Three species (*Anadonta grandis*, *Leptodea fragilis*, and *Potamilus ohiensis*) made up 87.5 percent of the total number of specimens collected during Keevin and Cummings' (2000) mussel survey of the MMR, which is likely representative of the mussels that could occur within the side channel near the project area.

Table 2. Common species of fish collected in the MMR by UMRR-LTRM from 2000 to 2014.

Species	Percent of Total Catch	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. (2005).

3.5 Federally Threatened and Endangered Species: Tier II Biological Assessment

This section and section 4.6 of this report are being used to satisfy the requirements of completing a Tier II Biological Assessment for this project. In compliance with Section 7(c) of the

Endangered Species Act of 1973, as amended, the St. Louis District consulted with the U.S. Fish and Wildlife Service, Marion Ecological Services Sub-Office. Through the Service's Information, Planning, and Conservation (IPaC) System (accessed December 1, 2016) they provided a list of threatened and endangered species that could potentially occur within the vicinity of the project area. According to the Service, three federally endangered species and one federally threatened species may occur within the project area (Table 3). There is no federally designated critical habitat in the proposed project area. Further, the official species list provided by the Service's IPaC System lacked an endangered species known to occur within the project area: the interior least tern (*Sterna antillarum*), as well as two threatened species, the piping plover (*Charadrius melodus*) and the rufa red knot (*Calidris canutus rufa*). The occurrence of these species in Scott County was confirmed through the Service's Environmental Conservation Online System (ECOS), and were thus included in this Biological Assessment.

Gray Bat

The gray bat (*Myotis grisescens)* is listed as endangered and occurs in several Illinois and Missouri counties where it inhabits caves both summer and winter. This species forages in riparian forest canopy and over rivers and reservoirs adjacent to forests.

Indiana Bat

The range of the Indiana bat (*Myotis sodalis*) includes much of the eastern half of the United States, including southern Missouri. 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 forests, 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 early 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.

The leading causes of the Indiana bat population decline includes disturbance, vandalism, improper cave gates and structures, natural hazards such as flooding or freezing, microclimate changes, land use changes in maternity range, and chemical contamination (USFWS 2000, 2004). To avoid incidental take of this species, the Service recommends tree clearing activities should not occur during the period of 1 April to 30 September. In addition, trees suitable for bat roosts or maternity colonies should not be removed without first performing a bat survey.

Table 3. Federally listed threatened and endangered species that could potentially occur within the vicinity of the project 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.
Pallid sturgeon (*Scaphirhynchus albus*)	Endangered	Mississippi and Missouri Rivers
Least tern (*Sterna antillarum*)	Endangered	Large rivers - nest on bare alluvial and dredge disposal islands.
Piping plover (*Charadrius melodus*)	Threatened	River Sandbars
Rufa Red knot (*Calidris canutus rufa*)	Threatened	Shorebird that migrates through Missouri – irregularly observed feeding on mudflats, sandbars, shallowly flooded areas and pond margins along the Missouri and Mississippi Rivers from May 1 through September 30.

Northern Long-Eared Bat

The northern long-eared (*Myotis septentrionalis*) bat is a federally threatened bat species. The northern long-eared bat is sparsely found across much of the eastern and north central United States, and all Canadian provinces from the Atlantic Ocean west to the southern Yukon Territory and eastern British Columbia. Northern long-eared bats spend winter hibernating in large caves and mines. During summer, this species roosts singly or in colonies underneath bark, in cavities, in crevices of both live and dead trees. Foraging occurs in interior 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, white-nose 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 project area.

Pallid Sturgeon

The pallid sturgeon is federally endangered big-river fish species. It is the position of the Service that over time, river training structures have adversely affected pallid sturgeon by impacting 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). In addition to the habitat changes, reduction in the natural forage base for the pallid sturgeon is likely another factor contributing to the species decline (Mayden and Kuhajda 1997, USFWS 2000). The Service states that river 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 et al. 1974, Wlosinski 1999, USFWS 2000). As a result, areas that were historically aquatic habitats are now dry at low discharges (Wlosinski 1999). This has potentially reduced the availability of pallid sturgeon spawning habitat through the loss of habitat heterogeneity (USFWS 2000).

Least Tern

The interior population of the least tern (*Sterna antillarum*) is characterized as a colonial, migratory waterbird, which resides and breeds along the Mississippi River during the spring and summer. Least tern 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 1999). Sparsely vegetated portions of sandbars and islands are typical breeding, nesting, rearing, loafing, and roosting sites for least tern 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 1999).

Given the highly dynamic nature of the historic MMR planform, the 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 are emergent during the 15 May to 31 August period are potentially available to least terns (USACE 1999).

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 1999). Fishing occurs close to the nesting colonies and may occur in both shallow and deep water, in main channel and backwater habitats. Radiotelemetry studies have shown that least tern will travel up to 2.5 miles to fish (Sidle and Harrison, 1990, USACE 1999). 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, over eddies

along natural and revetted banks, and at "run outs" from floodplain lakes where forage fish may be concentrated (USACE 1999, Niles and Hartman 2009).

Piping Plover

Piping plovers use wide, flat, open, sandy beaches with very little grass or other vegetation. Nesting territories often include small creeks or wetlands. Piping plovers are migratory birds and occasionally are seen on Missouri shorelines or at wetlands. In the spring and summer they breed in northern United States and Canada. There are three locations where piping plovers nest in North America: the shorelines of the Great Lakes, the shores of rivers and lakes in the Northern Great Plains, and along the Atlantic Coast. In the fall, plovers migrate south and winter along the coast of the Gulf of Mexico or other southern locations (USFWS 2015a).

Rufa Red Knot

The rufa red knot is a robin-sized shorebird that annually migrates from the Canadian Arctic to southern Argentina. Changing climate conditions are already affecting the bird's food supply, the timing of its migration, and its breeding habitat in the Arctic. The shorebird is also losing areas along its range due to development. New information shows some knots use interior migration flyways through the South, Midwest and Great Lakes. Small numbers (typically fewer than 10) can be found during migration in almost every inland state over which the knot flies. This shorebird is irregularly observed feeding on mudflats, sandbars, shallowly flooded areas and pond margins along the Missouri and Mississippi Rivers from May 1 through September 30 (USFWS 2015b).

3.6 Socioeconomic Resources

The Middle Mississippi River is a critically important navigation corridor that enables transportation of a wide variety of commodities of local, national, and international importance. Over 109 million tons of cargo passed through the MMR in 2014, the most recent year with data available (USACE 2014). Examples of commodities and tonnage that passed through the MMR in 2014 include food and farm products (38 million tons), coal (16 million tons), crude materials (5 million tons), petroleum products (9 million tons), chemicals and related products (12 million tons), iron and steel products (5million tons), and non-metallic ores and minerals (5 million tons).

The Burnham Island project area is surrounded by rural land with relatively low population densities. In 2010, Scott County, Missouri, had a total population size of 39,191 individuals, according to the U.S. Census Bureau's 2010 Demographic Profile, which has likely declined to an estimated 39,008 individuals as of 2015 (http://factfinder.census.gov; Accessed 12 December 2016). Based on the 2010 Demographic Profile, the county population is 48.2 percent male, 51.8 percent female, 85.7 percent white, 11.4 percent black or African American, and 0.2 percent American Indian. According to 2015 estimates, the median household income is $39,162, 19.6 percent of the population lives below the poverty level, and the unemployment rate is 6.8 percent.

3.7 Environmental Justice (EO 12898)

Environmental justice refers to fair treatment of all races, cultures and income levels with respect to development, implementation and enforcement of environmental laws, policies and actions. Environmental justice analysis was developed following the requirements of Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations, 1994) and the Department of Defense's Strategy on Environmental Justice (March 24, 1995).

The purpose of environmental justice analysis is to identify and address, as appropriate, human health or environmental effects of the proposed action on minority and low income populations. Following the above directives, the methodology to accomplish this includes identifying minority and low-income populations within the study area by demographic analysis. Although a substantial portion of the population of Scott County consists of minorities and people living below the poverty level (see section 3.6), the proposed action would occur entirely within aquatic areas on the Mississippi River. As such, impacts to minority and low-income populations in Scott County are not anticipated.

3.8 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 redesignated 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.

When a federal action is being undertaken in a nonattainment area, the federal agency responsible for the action is required to determine if its action conforms to the applicable State Implementation Plan (SIP). A SIP is a plan that provides for implementation, maintenance, and enforcement of the NAAQS and includes emission limitations and control measures to attain and maintain the NAAQS. Scott County, Missouri is currently in attainment for all criteria pollutants (EPA 2016). As such, a conformity determination has not been prepared for the proposed project, and an emissions analysis has not been performed.

3.9 Historic and Cultural Resources

The Mississippi River bankline directly upstream of the project area has not significantly changed in the past century and a half (Figure 7). The Missouri bank has, however, accreted in a number of places and Doolan Chute has closed. The new sandbars would be located in areas that have continually been within the Mississippi River since at least the late 19th century. They will be constructed via dredge, without recourse to land access; therefore, any effects are

limited to submerged cultural resources. Primary among these are historic period shipwrecks. Given the continual river flow and associated sedimentary erosion, deposition, and reworking, it is highly unlikely that any more ephemeral cultural material remains on the river bed.

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 (Norris 2003). The nearest observed wreck to the project features was located about a mile away in the Santa Fe Chute on the opposite side of Burnham Island.

The river bed in the project area is surveyed every year or two, with the latest multibeam survey having been completed in 2015. No topographic anomalies suggesting wrecks are visible on the resulting bathymetric map of the project area (Figure 4).

3.10 Prime or Unique Farmland (7USC 4201)

Although agricultural land is located near the project area, the proposed action would occur entirely within aquatic areas of the Mississippi River. As such, Prime or Unique Farmland does not exist within the project area.

3.12 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 et al. 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

[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).

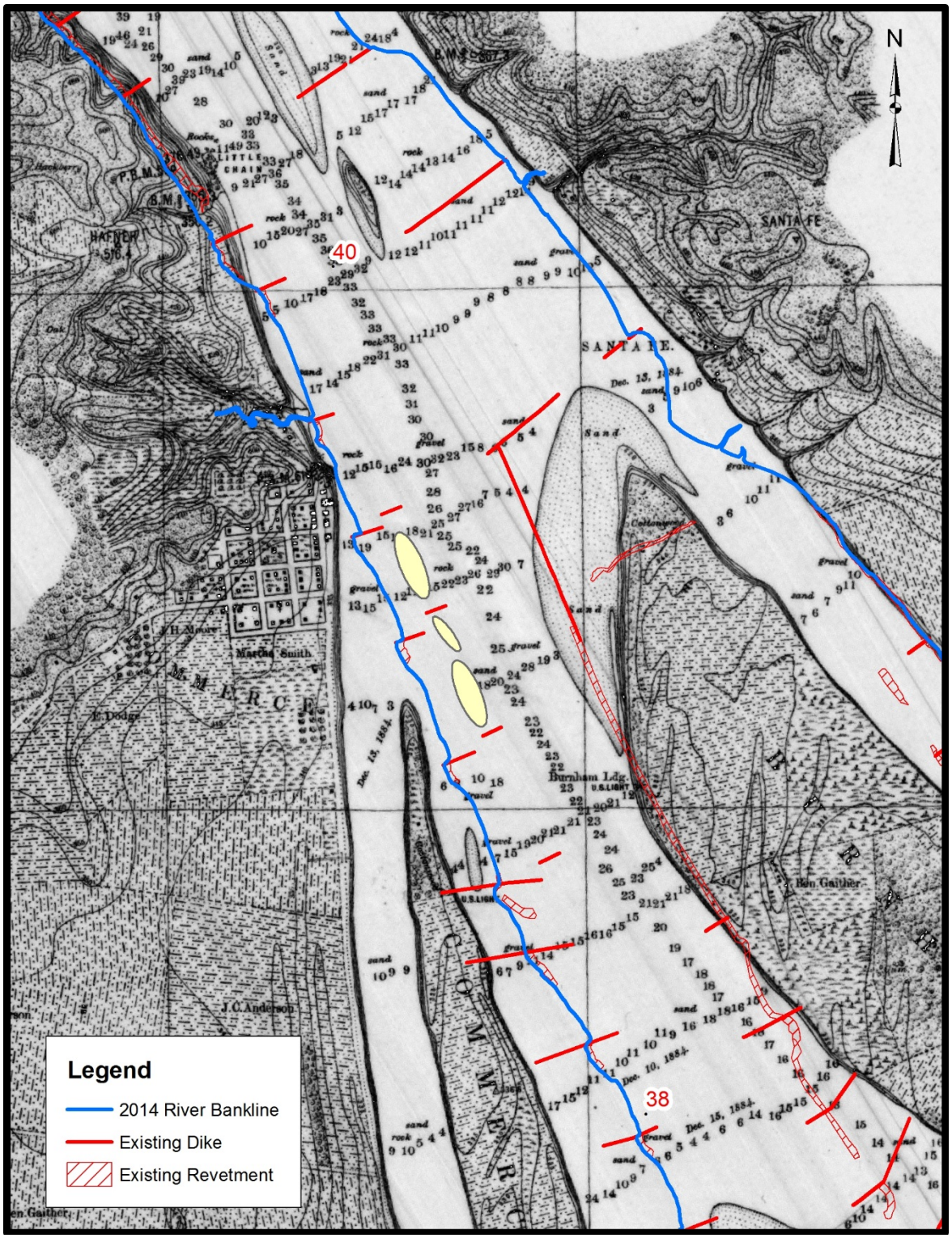

Figure 7. Project features superimposed on 1890 MRC chart.

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 events (Villarini et al., 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 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.*

Chapter 4 Environmental Consequences

This chapter describes the impacts of each considered alternative for each resource topic discussed from Chapter 3. The depth of analysis of the alternatives corresponds to the scope and magnitude of the potential environmental impact. This chapter compares the adverse and beneficial effects (direct, indirect, and cumulative) and significance of each alternative.

4.1 Physical Setting

Impacts of the No Action Alternative on Physical Setting - Under the no action alternative, the physical setting of the project area is expected to remain in its current condition. The off-set dikes would continue to enhance the bathymetric diversity of the area, while simultaneously constricting the river's flow toward the navigation channel. However, accretion of sediment in the navigation channel is expected to continue within the project area vicinity, requiring further channel maintenance dredging, and disposal of dredged material within the dike field on the right descending bank. Use of the traditional rigid pipe side casting method is anticipated with future channel maintenance dredging. This would do nothing to further enhance bathymetric diversity in the area, nor would it create habitat for pallid sturgeon or least tern.

Impacts of the Proposed Action on Physical Setting - Implementation of the proposed action would have direct beneficial impacts to the physical setting of the project area vicinity by enhancing bathymetric diversity and enhancing habitat for pallid sturgeon and least tern. Three areas of sandbar habitat would be built upon higher elevation areas adjacent to the off-set dikes in the project area. The dredge disposal material used to create the sandbars would come directly from the navigation channel within the project area.

Because the material used to build the proposed sandbars would be hydraulically dredged from the navigation channel, an area of the navigation channel would simultaneously be lowered in elevation while building the sandbars. However, since the bed of the navigation channel of the MMR is a relatively homogeneous, characterized as being mostly continuous rolling sand waves, no adverse impacts would result from the decrease in riverbed elevation. Rather, the proposed project could potentially reduce future channel maintenance dredging. As previously mentioned, the District would target a dredging area from the navigation channel that is relatively high in elevation, because this area would provide the most disposal material with which to build the sandbars. An area such as this would likely continue to accumulate sediment, and could become a necessary channel maintenance dredging site in the near future. Therefore, implementation of the proposed project could reduce the likelihood of repetitive dredging in the future. Lastly, no other physical impacts to the terrestrial or aquatic areas within the project vicinity are expected to occur. Although close to the proposed action area, the city of Commerce's public access ramp is located upstream of the proposed dredging and disposal locations, and would therefore not be impacted by the project.

4.2 Stages

Impacts of the No Action Alternative on Stages - Stages in the proposed project area and the Middle Mississippi River would be expected to be similar to current conditions under the No Action Alternative.

Impacts of the Proposed Action on Stages - With implementation of the Proposed Action, stages at low, average, and high flows both in the project area vicinity and in the MMR are expected to be similar to current conditions.

4.3 Water Quality

Impacts of the No Action Alternative on Water Quality - The no action alternative would not affect water quality within the project area. Neither short-term nor permanent impacts to water quality would occur. Under this alternative, it is anticipated that water quality parameters would remain relatively constant, and be comparable to the average readings displayed in section 3.3 (Table 1).

Impacts of the Proposed Action on Water Quality - With the proposed action, temporary increases in turbidity are likely to occur during creation of the sandbar habitat using dredge disposal material. Turbidity levels are expected to return to pre-construction levels once the project is complete. No long-term negative impacts to water quality are anticipated. No violations of any Missouri water quality standards are anticipated.

Dredging and dredge disposal in the project area are currently in full compliance with all applicable sections of the Clean Water Act (CWA). This project would be performed under existing CWA Section 404 and Section 401 authorizations for the Regulating Works Project's dredging and dredge disposal in this area. Therefore, a separate CWA water quality analysis will not be performed for the purposes of this project.

4.4 Fisheries and Aquatic Habitat

Impacts of the No Action Alternative on Fisheries and Aquatic Habitat - Under the no action alternative, the aquatic habitat is expected to be similar to current conditions. The area would continue to provide moderate habitat diversity, and the local assemblage of aquatic organisms would likely remain the same as described in Section 3.4. The off-set dikes would continue to create areas of turbulent water near the dike tips and in between the dike segments, as well as low velocity areas behind the dikes.

The District conducts annual inspections of its river training structures, and addresses those in need of maintenance. Therefore, it is expected that the off-set dikes will be maintained to their design elevation and dimensions, and will continue to produce the observed scour holes and depositional areas within the dike field. Dredge disposal material would not be used to build upon the existing high elevation areas downstream of the off-set dikes - the elevation of these

areas would likely remain similar to their current elevations, providing only moderate bathymetric/habitat diversity to the area.

Impacts of the Proposed Action on Fisheries and Aquatic Habitat - Under the proposed action, the overall aquatic habitat within the project area would be improved. In particular, the overall bathymetric diversity in the area would be enhanced, and the difference in elevation between deep and shallow areas would be increased. By building upon the relatively unique bathymetric profile of the area, which results from the off-set dike structures, the preferred alternative would create a localized mosaic of main channel sandbar habitat. The proposed sandbar habitat, coupled with the off-set dike structures, would provide the habitat conditions thought to be utilized by endangered pallid sturgeon.

Furthermore, this macrohabitat type may be necessary for the survival and eventual recruitment of larval pallid sturgeon. After collecting young-of-year (age-0) sturgeon (*Scaphirhynchus spp*.) from the Missouri River from 2007 - 2009, Ridenour et al. (2011) found that age-0 sturgeon were relatively more abundant at rootless dikes and channel sandbar habitats, when compared to other macrohabitat types (e.g., wing dike, bankline, wooded island), and that these two habitat types were most often characterized by high velocity current and sand substrate. They do concede however, that pallid sturgeon may behave differently in the MMR. For example, Phelps et al. (2010) collected age-0 sturgeon in greater abundance from low velocity areas in the MMR, such as channel borders and island tips. Phelps et al. (2010) also demonstrate a link between sand substrate and greater abundance of age-0 sturgeon. Similar to the aforementioned studies, Allen et al. (2007) documented juvenile pallid sturgeon selecting sand substrate over other substrate types (e.g., gravel, wood).

Research on pallid sturgeon habitat use suggests this relatively long lived species requires multiple habitat types throughout its life, and that habitat utilization may be different for populations inhabiting different river systems, which may be related to the severity and type of anthropogenic modifications that afflict these different systems (i.e., impounded vs. channelized). However, there does seem to be some consensus on what substrate type this species most likely prefers (i.e., sand). Dredging sand from the navigation channel of the MMR and using it to build sandbar habitat adjacent to off-set dikes would create a plethora of mesohabitat conditions located in close proximity to each other. This type of habitat heterogeneity is expected to provide habitat to pallid sturgeon of all life stages (i.e., larval, juvenile, and adult). Combinations of mesohabitat features that are expected to result from the project include (1) shallow, sandy, low velocity areas behind the off-set portion of the dike structures, (2) shallow, sandy, high velocity areas immediately downstream of the off-set dikes, as well as (3) deep, sandy, high velocity areas downstream of the disjunct segment of the dike structures. Ultimately, because of the enhanced habitat heterogeneity, the proposed project may result in greater abundance of pallid sturgeon within the immediate area, as well as greater abundance of their suspected prey species; sturgeon chub and sicklefin chub.

Regarding the rest of the MMR's fish assemblage, especially the species that occur most abundantly throughout the MMR (see Section 3.4, Table 2), it is anticipated that their

abundance within the project area vicinity would increase as well. Many of these species, the macrohabitat generalists in particular, have been collected in greater abundance from shallow areas within the MMR. By increasing the average elevation of the riverbed within the project area, it would better meet the habitat requirements for many of the fish species that inhabit the MMR.

As discussed in Section 3.4, historic and present mussel abundance and diversity in the MMR is relatively low, and no mussel beds are known to exist. Mussels occur scattered and in low densities within the MMR, and it is not likely that any mussels would be present at the dredge disposal locations. However, any mussels that did happen to occupy the dredge disposal locations would be smothered during project construction, as would other benthic invertebrates. These organisms would be expected to recolonize the project area within a year after project completion.

4.5 Federally Threatened and Endangered Species: Tier II Biological Assessment

In accordance with the Endangered Species Act, a list of federally threatened and endangered species was obtained from the Service. This section will also serve as the effects determination portion of the Biological Assessment required by the Endangered Species Act. This satisfies the requirement for Section 7 Consultation under the Endangered Species Act. The gray bat, Indiana bat, northern long-eared bat, least tern, pallid sturgeon, piping plover, and rufa red knot are listed as federally threatened or endangered species that may occur within the vicinity of the project area.

Gray Bat

Impacts of the No Action Alternative on Gray Bat - No caves would be impacted under this alternative. As such, this alternative will have *no effect* on gray bat.

Impacts of the Proposed Action on Gray Bat - No caves would be impacted by the proposed action. No construction activities will occur on land. Therefore, this action will have *no effect* on gray bat.

Indiana Bat

Impacts of the No Action Alternative on Indiana Bat Under the no action alternative, terrestrial habitat adjacent to the project area would remain in its current condition. Trees that provide adequate roosting habitat for Indiana bat would not be impacted. Therefore, this alternative would have *no effect* on Indiana bat.

Impacts of the Proposed Action on Indiana Bat - This project does not call for the removal of any trees; dredging and dredge disposal would be completed by river-based equipment and will not result in the destruction of any forested riparian habitat. However, unforeseen effects from construction activities (e.g., noise), could potentially disturb Indiana bats roosting on the land adjacent to the project area. As such, the proposed action *may affect, but is not likely to adversely affect* the Indiana bat.

Northern Long-Eared Bat

Impacts of the No Action Alternative on Northern Long-Eared Bat - Under the no action alternative, terrestrial habitat adjacent to the project area would remain in its current condition. Trees that provide adequate roosting habitat for northern long-eared bat would not be impacted. Therefore, this alternative would have *no effect* on northern long-eared bat.

Impacts of the Proposed Action on Northern Long-Eared Bat - This project does not call for the removal of any trees; all dredging and dredge disposal would be completed by river-based equipment and will not result in the destruction of any forested riparian habitat. However, unforeseen effects from construction activities (e.g., noise), could potentially disturb northern long-eared bats roosting on the land adjacent to the project area. As such, the proposed action *may affect, but is not likely to adversely affect* northern long-eared bat.

Pallid Sturgeon

Impacts of the No Action Alternative on Pallid Sturgeon - Under the no action alternative, dredge disposal material would not be used to create sandbar habitat downstream of the off-set dikes. Bathymetric diversity in the area would remain similar to its current condition, providing only moderate habitat quality to pallid sturgeon. The Regulating Works Project's impacts to pallid sturgeon would continue, and the RPA listed under the Service's Biological Opinion would not be satisfied by this alternative. Therefore, this alternative *may affect, but is not likely to adversely affect* pallid sturgeon.

Impacts of the Proposed Action on Pallid Sturgeon- The proposed action was developed to benefit pallid sturgeon as a Reasonable and Prudent Alternative provided in the Service's Biological Opinion. See Section 4.4.2 for a more detailed discussion on how the project would enhance aquatic habitat and benefit pallid sturgeon. The District has concluded that short-term adverse impacts may occur during project implementation, but are limited (e.g., increased turbidity, noise, and smothering of benthic invertebrates). The District further concludes that the benefits of using dredge disposal material to create sandbar habitat far outweigh those potential impacts. Thus, the project *may affect, but is not likely to adversely affect* pallid sturgeon.

Least Tern

Impacts of the No Action Alternative on Least Tern - Under the no action alternative, dredge disposal material would not be used to create sandbar habitat downstream of the off-set dikes. Habitat for nesting least tern would remain in its current condition within the MMR. The Regulating Works Project's impacts to least tern would continue, and the RPM's listed under the Service's Biological Opinion would not be satisfied by this alternative. Therefore, this alternative *may affect, but is not likely to adversely affect* least tern.

Impacts of the Proposed Action on Least Tern - The proposed action could have a beneficial effect for nesting least tern. Using dredge disposal material to create sandbar habitat could increase the total area of nesting habitat available to least terns in the MMR, depending on

river stage fluctuations within a few years after project completion. This would improve the potential for successful reproduction and recruitment of least tern. Although likely to prove beneficial to least tern, short term effects brought on by construction activities (e.g., noise, emissions) may negatively affect least tern. Thus, the project *may affect, but is not likely to adversely affect* least tern.

Piping Plover

Impacts of the No Action Alternative on Piping Plover- Under the no action alternative, dredge disposal material would not be used to create sandbar habitat downstream of the off-set dikes. The physical layout of the area would remain similar to its current condition, providing no habitat for the piping plover. This alternative would have *no effect* on the piping plover.

Impacts of the Proposed Action on Piping Plover There is no known piping plover nesting habitat in the project area. This bird is a rare migrant along the MMR, and during migration, exposed sand bars in the project area provide temporary feeding habitat. The proposed sandbar creation would provide habitat that could potentially be used by the piping plover, depending on river stage fluctuations during piping plover migrations. Although likely to prove beneficial to piping plover, short term effects brought on by construction activities (e.g., noise, emissions) may negatively affect them. Therefore, the project *may affect, but is not likely to adversely affect* piping plover.

Rufa Red Knot

Impacts of the No Action Alternative on Rufa Red Knot - Under the no action alternative, dredge disposal material would not be used to create sandbar habitat downstream of the off-set dikes. The physical layout of the area would remain similar to its current condition, providing no habitat for the rufa red knot. This alternative would have *no effect* on the rufa red knot.

Impacts of the Proposed Action on Rufa Red Knot - There is no known rufa red knot nesting habitat in the project area. This bird is a rare migrant along the MMR, and during migration, exposed sand bars in the project area provide temporary feeding habitat. The proposed sandbar creation would provide habitat that could potentially be used by the rufa red knot, depending on river stage fluctuations during migrations. Although likely to prove beneficial to rufa red knot, short term effects brought on by construction activities (e.g., noise, emissions) may negatively affect them. Therefore, the project *may affect, but is not likely to adversely affect* rufa red knot.

4.6 Socioeconomic Resources

Neither alternative would negatively impact the navigation channel as commercial traffic would continue as normal adjacent to the project area. No significant impacts to the growth of the community or region would be realized as a direct result of the proposed action.

4.7 Environmental Justice

Impacts of the No Action Alternative on Environmental Justice - Under the no action alternative, no impacts to low income and minority populations are anticipated.

Impacts of the Proposed Action on Environmental Justice- The proposed action would occur entirely within aquatic areas of the MMR, therefore no impacts to any human population are anticipated. As such, the proposed project would not disproportionately affect low income or minority populations.

4.8 Air Quality

Impacts of the No Action Alternative on Air Quality - Under the no action alternative, air quality would remain in its current condition.

Impacts of the Proposed Action on Air Quality - With the proposed action, short-term affects to air quality would occur. Emissions from equipment would be generated during project implementation. However, no adverse long-term air quality impacts are anticipated in the region as a result of the proposed action. As discussed in Section 3.8, a detailed emissions analysis would not be performed for the proposed action because Scott County is currently designated as in attainment for the six criteria pollutants outlined under the Clean Air Act.

4.9 Historic and Cultural Resources

Impacts of the No Action Alternative on Historic and Cultural Resources - Under the no action alternative, there would be no risk to any known historic or cultural resources that may exist within the project area.

Impacts of the Proposed Action on Historic and Cultural Resources - All project work will be carried out via dredge, without recourse to land access; therefore, any effects are limited to submerged cultural resources. Primary among these are historic period shipwrecks. The continual river flow and associated sedimentary erosion, deposition, and reworking make it highly unlikely that any more ephemeral cultural material remains on the river bed.
Given the features' construction method (with no land impact), the previous disturbance of the riverbed, the channel history recorded for the location in the nineteenth century, and 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.

Via a letter dated 12 January, 2017, the Missouri State Historic Preservation Officer (SHPO) concurred that the proposed actions would not affect listed or eligible historic properties. A copy of the correspondence is included in Appendix A. If, however, cultural resources were to be encountered during construction, all work would stop in the affected area and further consultation would take place.

Via a letter dated 17 January, 2017, consultation with twenty-eight federally recognized tribes affiliated with the St. Louis District has been initiated and will continue as necessary during project implementation. All corresponding documents associated with this consultation have been included in this Final EA (Appendix A). If cultural resources were to be encountered during construction, all work would stop in the affected area and further consultation would take place.

4.10 Prime and Unique Farmland

The project area is located strictly within aquatic areas of the MMR; no agricultural land exists within the project area. As such, neither alternative would have any impact to Prime and Unique Farmland. The District has concluded the proposed action would have no impact on river stages and therefore will not impact agricultural land adjacent to the project area.

4.11 Climate Change and Greenhouse Gas Emissions

The proposed action would have no significant effect on climate resulting from greenhouse gas emissions. The amount of greenhouse gas emissions from construction activities would be negligible due to the limited duration of dredging. No permanent increase to greenhouse gas emissions would be realized as a result of the proposed action.

In the foreseeable future, climate change will not impact the environmental consequences of the proposed action. However, long-term changes to climate could alter regional weather patterns, thereby impacting the seasonal hydrology pattern of the MMR. Changes to the timing and duration of peak flows and low flows in the MMR could influence the duration of sandbar inundation and exposure.

4.12 Cumulative Effects

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, a cumulative impact analysis was recently conducted for five Environmental Assessments with signed Findings of No Significant Impact for the Regulating Works Project on the MMR (USACE 2014b; USACE 2014c; USACE 2014d; USACE 2015b; USACE 2016a; and USACE 2016b). Furthermore, 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.

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

The District has determined that an additional cumulative effects analysis for this project is not necessary because (1) the projects are located in the MMR, (2) the past, present, and reasonably foreseeable future actions are generally identical, and (3) the proposed action would have no additional incremental impacts to any resources; rather, it would alleviate the cumulative impacts that result from the Regulating Works Project.

5. Relationship to other Environmental Laws and Regulations

Table 4. 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.	Full
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
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.	Full
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.	Full
Wilderness Act, as amended, 16 USC § 1131, et seq.	Full
Executive Orders[2]	
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] This list of Executive Orders is not exhaustive and other Executive Orders not listed may be applicable.

6. List of Preparers

Table 5. List or report preparers, including their role and level of experience.

Name	Role	Experience
Mike Rodgers, P.E.	Project Manager	15 years, hydraulic engineering
Shane Simmons	Environmental Lead	4 years, biology
Tom Keevin, Ph.D.	Cumulative Impacts	35 years, aquatic ecology (retired)
Kevin Slattery	HTRW	18 years, environmental science
Mark Smith, Ph.D.	Historical and Cultural Resources	23 years, archaeology
Keli Broadstock	Legal Review	5 years USACE, 6 years private sector law

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FINDING OF NO SIGNIFICANT IMPACT

Burnham Island Sandbar Creation Project
Middle Mississippi River (RM 38.9 – 39.4 R)
Scott County, Missouri

1. In accordance with the National Environmental Policy Act, I have reviewed and evaluated the documents concerning the Burnham Island Sandbar Creation Project, Scott County, Missouri. 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 would enhance habitat diversity in the Middle Mississippi River. This would be accomplished through using dredge disposal material from the navigation channel to build sandbar habitat within a dike field.

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

    c. No significant impacts to natural resources are anticipated, including fish and wildlife resources. The proposed work would have no effect upon significant 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. Nor would the project adversely impact low-income or minority populations, prime and unique farmland, or socioeconomic resources.

    d. The No Action Alternative was evaluated and determined to be unacceptable as the St. Louis District is obligated to perform such activities to remain in compliance with the Endangered Species Act.

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 Burnham Island Sandbar Creation Project, Scott County, Missouri.

10 May 2017
(Date)

ANTHONY P. MITCHELL
COL, EN
Commanding

Burnham Island Sandbar Creation Project
Middle Mississippi River (RM 38.9 – 39.4 R)
Scott County, Missouri

FINAL ENVIRONMENTAL ASSESSMENT
WITH FINDING OF NO SIGNIFICANT IMPACT

May 2017

APPENDICES

Appendix A. Agency and Tribal Government Coordination

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

REPLY TO
ATTENTION OF:

January 17, 2017

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 (Corps), St. Louis District, is providing information in this letter that addresses the current planning and creation of sandbar habitat in the Mississippi River using dredge material. The work comprises the Burnham Island Sandbar Creation Project. We are contacting your tribe to initiate consultation regarding this project.

Beginning in 1824, the Congress of the United States authorized the Secretary of the Army, by and through the Corps, to make improvements to the Mississippi River, and some of its major tributaries, for the purpose of obtaining and maintaining an inland navigation channel for waterway commercial transportation throughout the United States. Ultimately for the Mississippi River, Congress authorized obtaining and maintaining at least a nine foot deep navigation channel from the Gulf of Mexico to Minneapolis, Minnesota, through multiple projects by various methods and management.

Congress authorized the ultimate plan for how the navigation channel should be obtained and maintained for a majority of the Middle Mississippi River (from the confluence of the Ohio River to the confluence of the Missouri River) in the Rivers and Harbors Act of 1910 and eventually established the current navigation channel dimensions of 9 feet deep and not less than 300 feet wide. Additional width in the bends as required was authorized in the Rivers and Harbors Act of 1927.

The proposed action is implementation of an ephemeral island/sandbar creation project near Burnham Island in the Middle Mississippi River (Figure 2). The goal of the project is to restore habitat for two federally endangered species: the pallid sturgeon (*Scaphirhynchus albus*) and the least tern (*Sterna antillarum*). Through implementation of the proposed federal action described herein, St. Louis District will remain in compliance with the ESA for the Regulating Works Project.

The project area is located along the right descending bank of the MMR between river miles 38.9 – 39.4 in Scott County, Missouri, approximately 11 miles southeast of Cape Girardeau, Missouri (Figure 3). The sandbars will be created with sediment dredged from the navigation channel using a hydraulic dredge and deposited via flexible-floating dredge pipe between river training structures.

The bankline upstream of Burnham Island has not significantly changed in the past century and a half (Figure 4). The Missouri bank has, however, accreted in a number of places and Doolan Chute has closed. The sandbars will be located in areas that have continually been within the Mississippi River since at least the late 19th century. They will be constructed via dredge, without recourse to land access; therefore, any effects are limited to submerged cultural resources. Primary among these are historic period shipwrecks. Given the continual river flow and associated sedimentary erosion, deposition, and reworking, it is highly unlikely that any more ephemeral cultural material remains on the river bed.

During the summer of 1988 when the Mississippi River was at a particularly low level, the St. Louis District conducted an aerial survey of exposed wrecks between Saverton, Missouri, and the mouth of the Ohio River (Norris 2003). The nearest observed wreck to the project features was located about a mile away in the Santa Fe Chute on the opposite side of Burnham Island.

The river bed in the project area is surveyed every year or two, with the latest processed survey having been completed in 2015. No topographic anomalies suggesting wrecks are visible on the resulting bathymetric map of the project area.

Given the features' construction method (with no land impact), the previous disturbance of the riverbed, the channel history recorded for the location in the nineteenth century, and 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.

Please notify our office no later than March 1, 2017, if you have any areas of concern. If you have any questions or comments, please feel free to contact me at (314) 331-8466 or Chris Koenig at (314) 331-8151 (e-mail: chris.j.koenig@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

Attachments

Figure 1. Burnham Island location on state map.

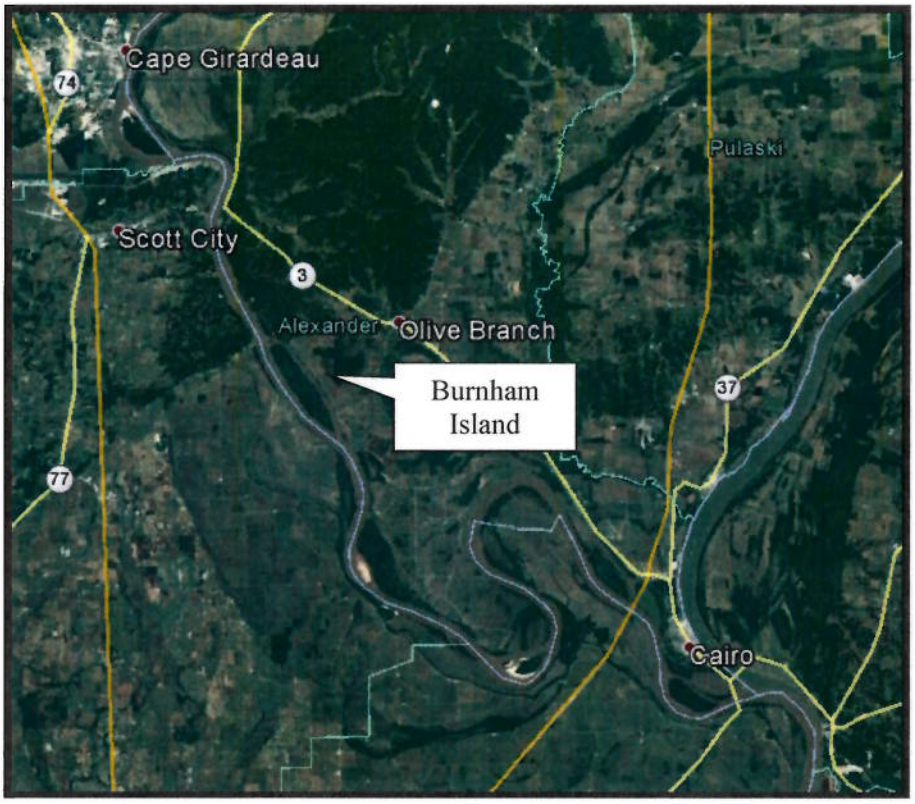

Figure 2. Burnham Island vicinity.

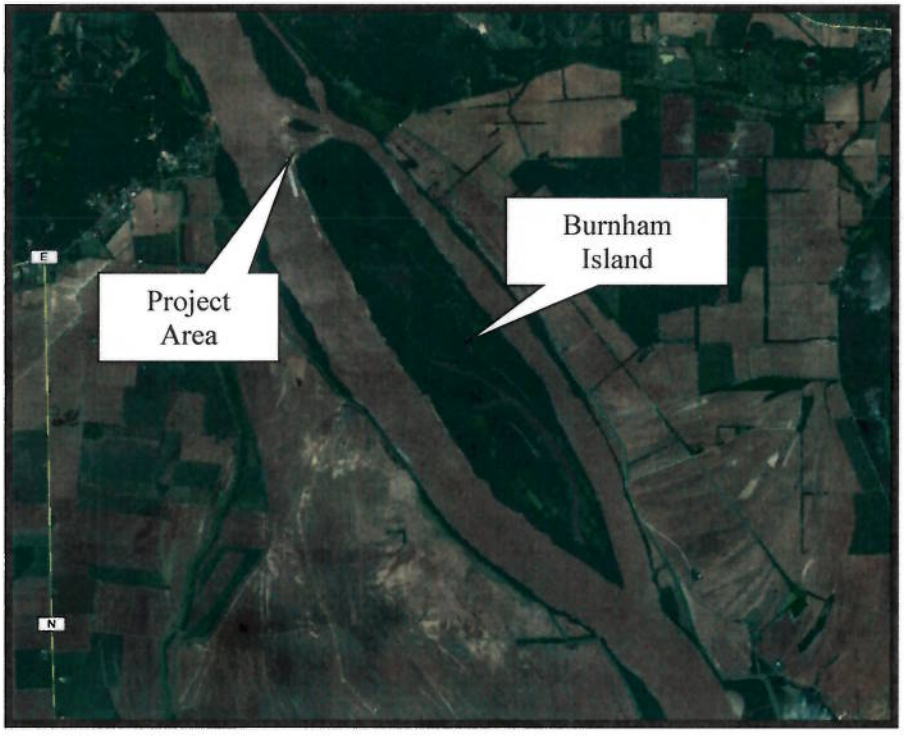

Figure 3. Project location, Scott County, Missouri.

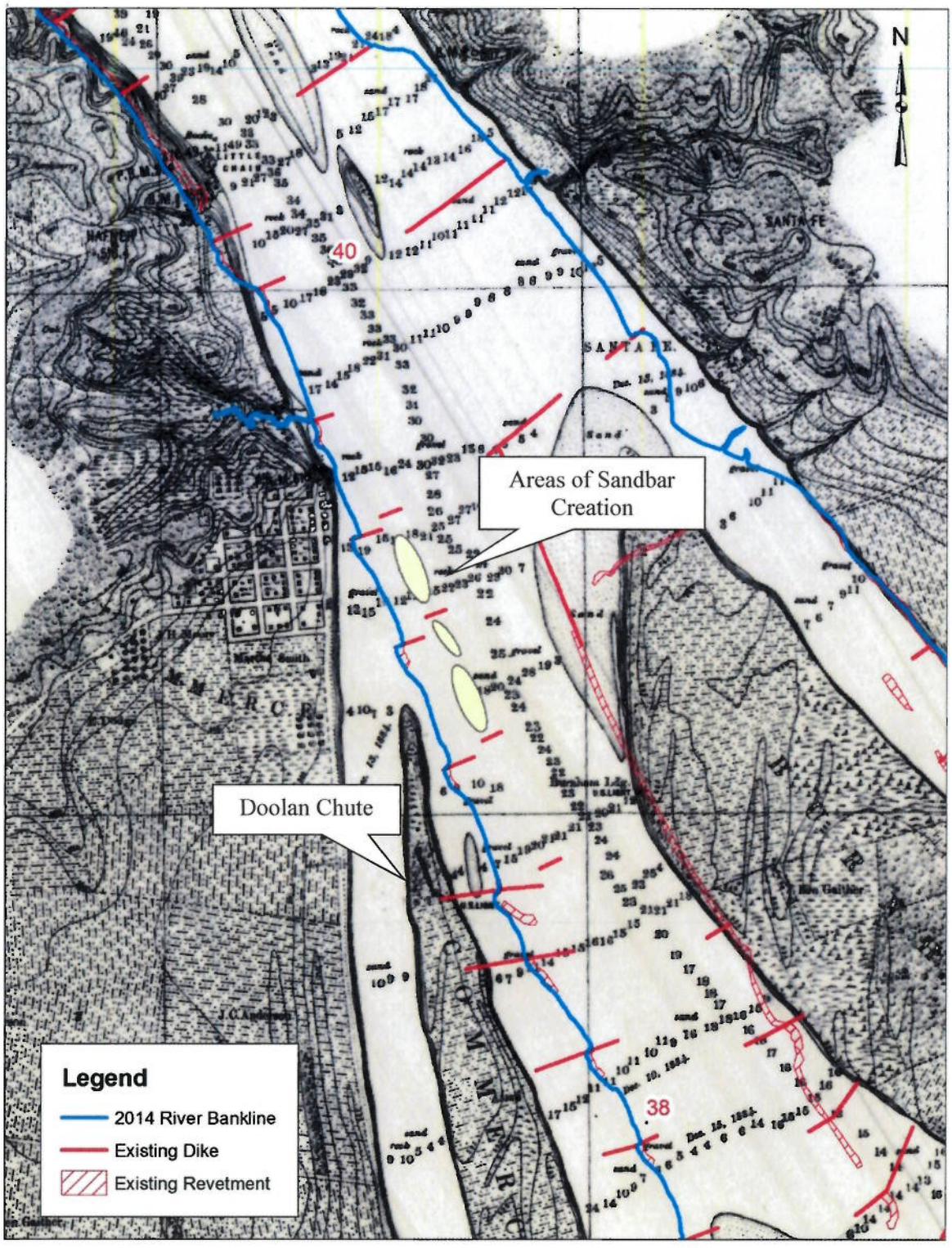

Figure 4. Project features superimposed on 1890 MRC chart.

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QUAPAW TRIBE OF OKLAHOMA

P.O. Box 765
Quapaw, OK 74363-0765
(918) 542-1853
FAX (918) 542-4694

February 3rd, 2017

Attn: Michael K. Trimble, Ph.D
Chief, Curation, and Archives
Department of the Army
St. Louis District Corps of Engineers
1222 Spruce Street
St. Louis, Missouri 63103-2833

Re: *Implementation of an ephemeral Island/sandbar creation project*

Dear Michael K. Trimble, Ph.D,

The Quapaw Tribe Historic Preservation Office has received and reviewed the information provided for the proposed Implementation of an ephemeral Island/sandbar creation project Scott County, Missouri and concurs with your findings that this project is not likely to adversely affect properties of cultural or sacred significance to the Quapaw Tribe.

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

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

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

Dear Mr. Koenig:

Aya, kikwehsitoole – I show you respect. 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 a consulting 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

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

REPLY TO
ATTENTION OF:

January 04, 2017

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

Ms. Judith Deel, Senior Archaeologist
Office of Historic Preservation
Missouri Department of Natural Resources
P.O. Box 176
Jefferson City, Missouri 65102

Subject: Burnham Island Sandbar Creation Project

Dear Ms. Deel:

The United States Army Corps of Engineers (Corps), St. Louis District, is presently planning the creation of sandbar habitat in the Mississippi River using dredge material. The work comprises the Burnham Island Sandbar Creation Project. We are contacting your office to initiate consultation under Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and its implementing regulation 36 CFR 800.

Background

Beginning in 1824, the Congress of the United States authorized the Secretary of the Army, by and through the Corps, to make improvements to the Mississippi River, and some of its major tributaries, for the purpose of obtaining and maintaining an inland navigation channel for waterway commercial transportation throughout the United States. Ultimately for the Mississippi River, Congress authorized obtaining and maintaining at least a nine foot deep navigation channel from the Gulf of Mexico to Minneapolis, Minnesota, through multiple projects by various methods and management.

Congress authorized the ultimate plan for how the navigation channel should be obtained and maintained for a majority of the Middle Mississippi River (from the confluence of the Ohio River to the confluence of the Missouri River) in the Rivers and Harbors Act of 1910 and eventually established the current navigation channel dimensions of 9 feet deep and not less than 300 feet wide, with additional width in the bends as required, in the Rivers and Harbors Act of 1927.

In performing this responsibility, the Corps is committed to complying with the Endangered Species Act (ESA). In executing responsibilities under the ESA, the Corps recognizes that there is to be deference to the U.S. Fish and Wildlife Service (Service). It is incumbent upon the Service to provide biological advice and guidance that allows the Corps to achieve compliance with the ESA within the Corps' statutory authorities and appropriations. Through

implementation of the proposed federal action described herein, St. Louis District will remain in compliance with the ESA for the Regulating Works Project.

Through a voluntary formal consultation process between the Corps and the Service, a Biological Opinion for the Operation and Maintenance of the 9-foot Navigation Channel on the Upper Mississippi River System (UMRS) was submitted to the Corps from the Service on May 15, 2000. After continued discussions, the Corps submitted a letter to the Service on August 11, 2000. This letter described how the Corps proposed to proceed with the future operation and maintenance of the 9-foot channel navigation projects for the UMRS in light of its ESA obligations and the information provided to the Corps in the Service's Biological Opinion.

The Service's Biological Opinion provided a number of requirements under a "Reasonable and Prudent Alternative" to avoid the likelihood of jeopardizing the continued existence of the federally endangered pallid sturgeon. One such requirement was to implement aquatic habitat restoration measures in the MMR that are expected to benefit the pallid sturgeon, such as using dredge disposal material to restore habitat. Further, the Service's Biological Opinion provided "Reasonable and Prudent Measures" to minimize the incidental take of the federally endangered least tern, such as using dredge disposal material in the Middle Mississippi River to restore sandbar habitat. This project is being conducted in accordance with the Reasonable and Prudent Alternative and the Reasonable and Prudent Measures of the Service's Biological Opinion.

Project

The proposed action is implementation of an ephemeral island/sandbar creation project near Burnham Island in the Middle Mississippi River (Figure 1). The goal of the project is to restore habitat for two federally endangered species: the pallid sturgeon (*Scaphirhynchus albus*) and the least tern (*Sterna antillarum*).

The project area is located along the right descending bank of the MMR between river miles 38.9 -- 39.4 in Scott County, Missouri, approximately 11 miles southeast of Cape Girardeau, Missouri (Figure 2). The sandbars will be created with sediment dredged from the navigation channel using a hydraulic dredge and deposited via flexible-floating dredge pipe between river training structures.

Potential Effects on Cultural Resources

The bankline upstream of Burnham Island has not significantly changed in the past century and a half (Figure 3). The Missouri bank has, however, accreted in a number of places and Doolan Chute has closed. The sandbars will be located in areas that have continually been within the Mississippi River since at least the late 19th century. They will be constructed via dredge, without recourse to land access; therefore, any effects are limited to submerged cultural resources. Primary among these are historic period shipwrecks. Given the continual river flow and associated sedimentary erosion, deposition, and reworking, it is highly unlikely that any more ephemeral cultural material remains on the river bed.

Possible Shipwrecks

During the summer of 1988 when the Mississippi River was at a particularly low level, the St. Louis District conducted an aerial survey of exposed wrecks between Saverton, Missouri, and the mouth of the Ohio River (Norris 2003). The nearest observed wreck to the project features was located about a mile away in the Santa Fe Chute on the opposite side of Burnham Island.

The river bed in the project area is surveyed every year or two, with the latest processed survey having been completed in 2015. No topographic anomalies suggesting wrecks are visible on the resulting bathymetric map of the project area (Figure 4).

Summation

Given the features' construction method (with no land impact), the previous disturbance of the riverbed, the channel history recorded for the location in the nineteenth century, and 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,

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

Enclosure

Figure 1. Burnham Island vicinity.

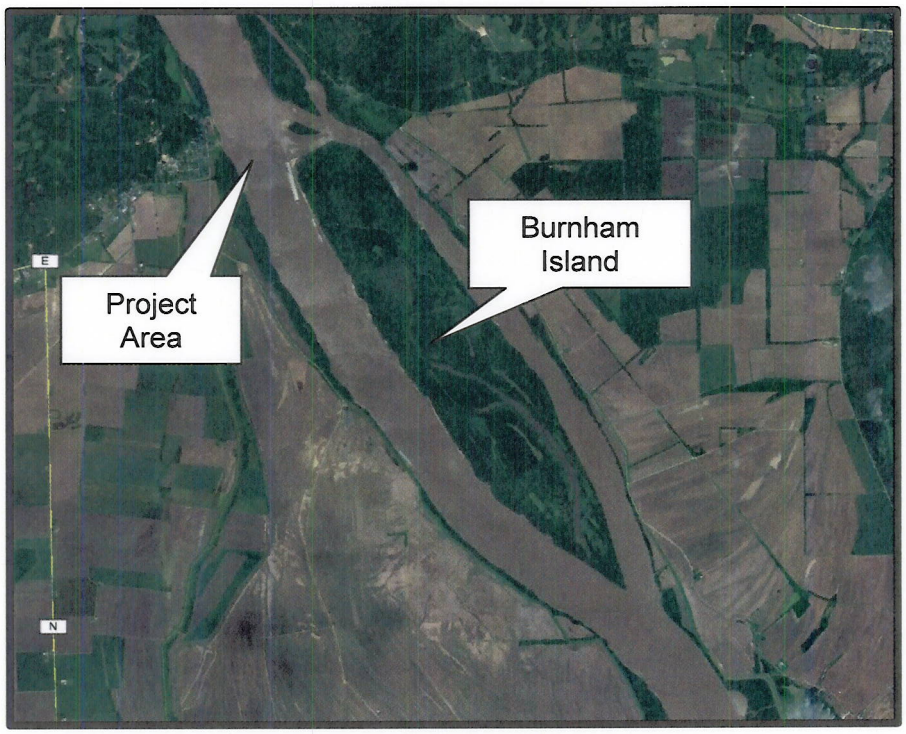


Figure 2. Project location, Scott County, Missouri.

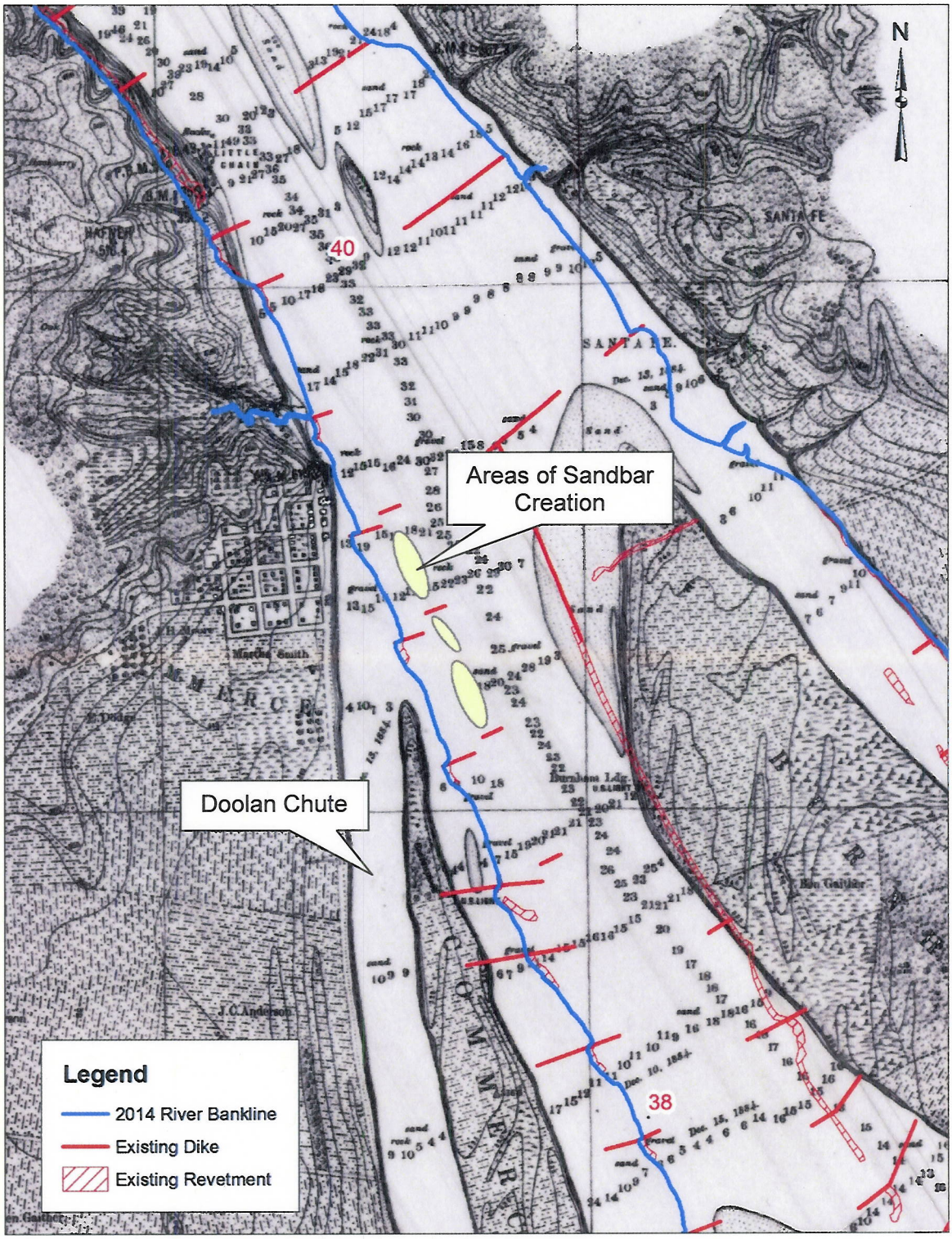


Figure 3. Project features superimposed on 1890 MRC chart.

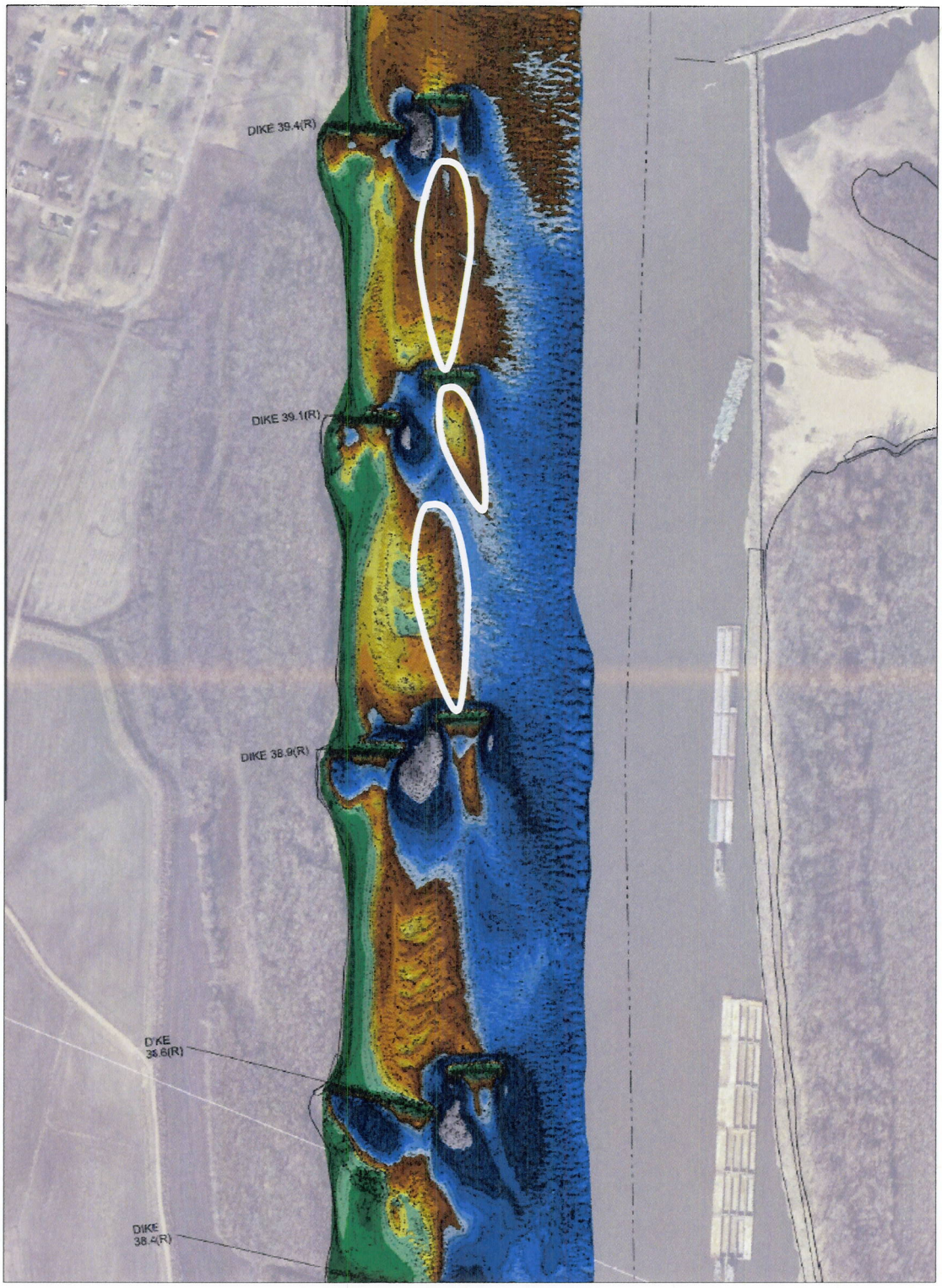


Figure 4. Results of multibeam bathymetric surveys performed at the project area in 2015, and the proposed location for dredge disposal and sandbar creation (white).

References Cited

Mississippi River Commission (MRC)
1881 Chart No 103. Survey of the Mississippi River.

Norris, F. T.
2003 Historical Shipwrecks on the Middle Mississippi and Lower Illinois Rivers. Curation and Archives Analysis Branch, U. S. Army Corps of Engineers, St. Louis District.

STATE OF MISSOURI
Eric R. Greitens, Governor • Todd Sampsell, Acting Director
DEPARTMENT OF NATURAL RESOURCES
dnr.mo.gov

January 12, 2017

Michael K. Trimble, Ph.D.
Chief, Curation & Archives Analysis Branch
St. Louis District, Corps of Engineers
1222 Spruce Street
St. Louis, Missouri 63103-2833

Re: Burnham Island Sandbar Creation Project (COE) Scott County, Missouri

Dear Dr. Trimble:

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

We have reviewed the information provided concerning the above referenced project. We concur with your determination that there will be **no historic properties affected** and, therefore, we have no objection to the initiation of project activities.

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

If you have any questions, please write Judith Deel at State Historic Preservation Office, P.O. Box 176, Jefferson City, Missouri 65102 or call 573/751-7862. Please be sure to include the SHPO Log Number (**017-MLT-17**) on all future correspondence or inquiries relating to this project.

Sincerely,

STATE HISTORIC PRESERVATION OFFICE

Toni M. Prawl

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

TMP:jd

c Mark Smith, COE/STL

Missouri Department of Conservation

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

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

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

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

PROJECT INFORMATION

Project Name and ID Number: Burnham Island Sandbar Creation Project #2102
Project Description: Middle Mississippi River (RM 38.9 – 39.4 R), Scott County, Missouri. The proposed Federal action is implementation of an ephemeral island/sandbar creation project near Burnham Island in the MMR. The goal of the project is to restore habitat for two federally endangered species: the pallid sturgeon (Scaphirhynchus albus) and the interior least tern (Sterna antillarum). The District would hydraulically dredge within the navigation channel adjacent to the offset dikes, and using the District's flex-pipe, dredge disposal material would be concentrated in circular/tear-drop shaped areas between the offset dikes near Burnham Island, increasing the elevation of the depositional areas and ultimately creating new sandbar habitat. Sediment will be deposited between the river training structures on the right descending bank between river miles 38.9 – 39.4. Specifically, three depositional areas totaling approximately 350,000 ft2 would be brought to a target elevation of +16 LWRP. The required volume of dredge disposal material is estimated to be approximately 280,000 yd3.
Project Type: Habitat Conservation and Restoration, In-stream habitat restoration (habitat improvement structures)
Contact Person: Shane Simmons
Contact Information: Shane.M.Simmons@usace.army.mil or (314)331-8496

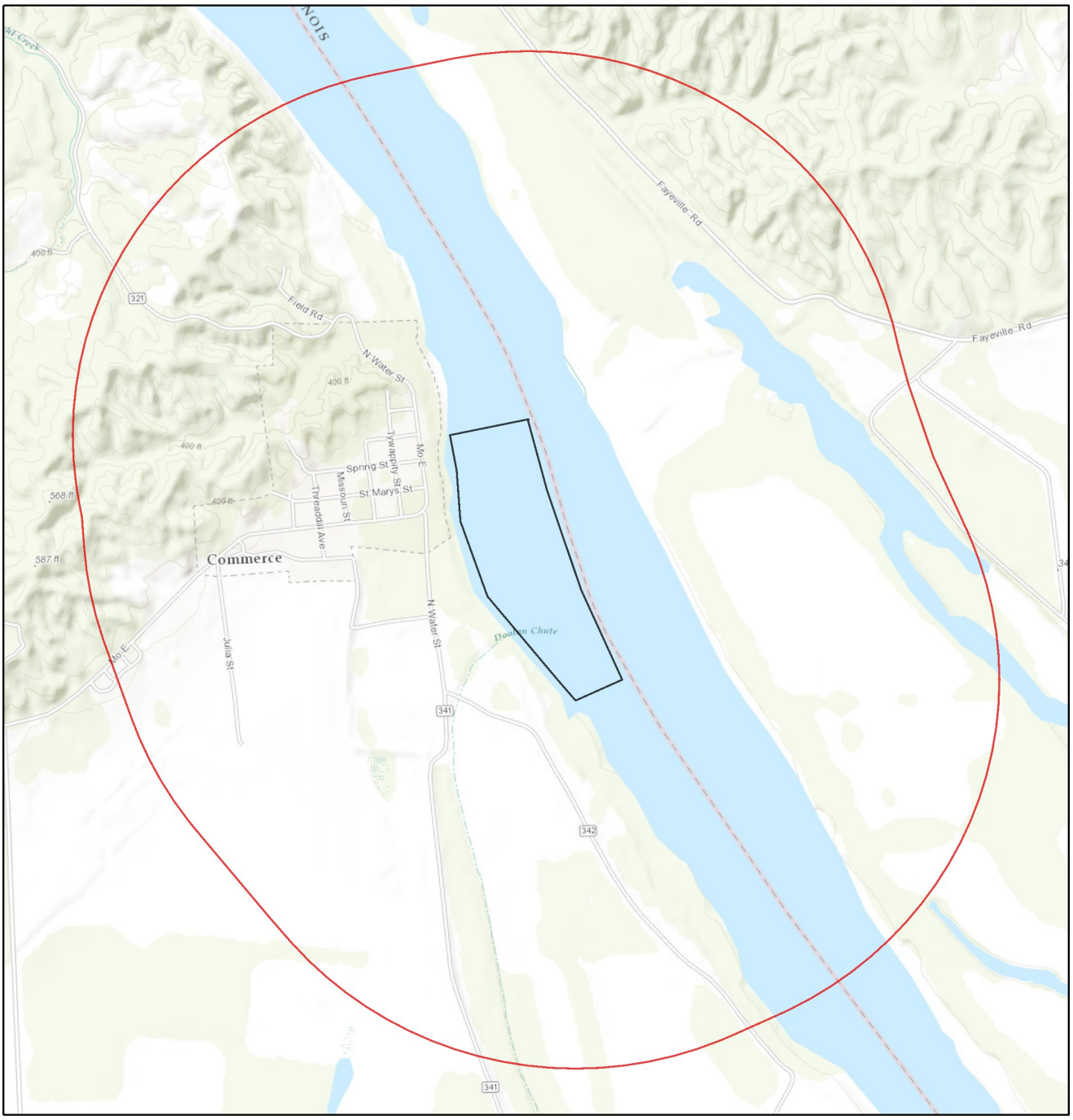
Disclaimer: The NATURAL HERITAGE REVIEW REPORT produced by this website identifies if a species tracked by the Natural Heritage Program is known to occur within or near the area submitted for your project, and shares suggested recommendations on ways to avoid or minimize project impacts to sensitive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

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

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

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

Burnham Island Sandbar Creation Project



December 1, 2016

1:23,861

0 0.2 0.4 0.8 mi

0 0.325 0.65 1.3 km

- Project Boundary
- Buffered Project Boundary

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

Species or Communities of Conservation Concern within the Area:

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

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

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

Other Special Search Results:

The project occurs on public land, COMMERCE ACCESS, please contact MDC.

Project Type Recommendations:

No recommendations have been identified for this project type.

Project Location and/or Species Recommendations:

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

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

The project location submitted and evaluated occurs within the known range of the Interior Least Tern in Missouri. Interior Least Terns (*Sterna antillarum athalassos,* federally and state listed endangered) nest and forage along the Mississippi River, and sometimes along the adjacent floodplain, from St. Louis to the southern boundary of the state. Habitat loss and diminishing water quality can impact least tern populations. See http://mdc.mo.gov/107 for best management recommendations.

The project location submitted and evaluated is located within or adjacent to the Mississippi or Missouri rivers. Pallid Sturgeons (*Scaphirhynchus albus*, federal- and state-listed endangered) are big river fish that range widely in the Mississippi and Missouri River system (including parts of some major tributaries). Any project that modifies big river habitat or impacts water quality should consider the possible impact to pallid sturgeon populations. See http://mdc.mo.gov/124 for Best Management Practices. Additional coordination with the U.S. Fish and Wildlife Service under the Endangered Species Act may be necessary (U.S. Fish and Wildlife Service, Ecological Services, 101 Park DeVille Drive, Suite A, Columbia, Missouri 65203-0007; phone 573-234-2132.)

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

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

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

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

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

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

Miscellaneous Information

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

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

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

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Columbia Ecological Services Field Office
101 PARK DEVILLE DRIVE, SUITE A
COLUMBIA, MO 65203
PHONE: (573)234-2132 FAX: (573)234-2181

Consultation Code: 03E14000-2017-SLI-0296 December 01, 2016
Event Code: 03E14000-2017-E-00307
Project Name: Burnham Island Sandbar Creation Project

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:

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

Threatened and Endangered Species

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

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact our office if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. **Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days.** This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, please visit species profiles at http://www.fws.gov/midwest/endangered/section7/s7process/lifehistory.html. Indiana bats, gray bats, and northern long-eared bats occur throughout Missouri and the information below may help in determining if your project may affect these species.

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

Indiana and northern long-eared bats - These species hibernate in caves or mines only during the winter. The rest of the year they roost under loose tree bark in tree crevices or cavities during the day and forage around tree canopies of floodplain, riparian, and upland forests at night. Trees which should be considered potential roosting habitat include those exhibiting loose or shaggy bark, crevices, or hollows. Tree species often include, but are not limited to: shellbark or shagbark hickory, white oak, cottonwood, and maple. If your project will impact caves or mines or will involve clearing forested habitat containing suitable roosting habitat, Indiana bats or northern long-eared bats could be affected. If your project will involve removal of over 5 acres of forested habitat, you may wish to complete a Summer Habitat Assessment prior to contacting our office in order to expedite the consultation process. The Summer Habitat Assessment Form is available in Appendix A of the most recent version of the Range-wide Indiana Bat Summer Survey Guidelines, located at www.fws.gov/midwest/Endangered/mammals/inba/ under the heading Summer Survey Guidance.

If no suitable habitat for any federally-listed, candidate, or proposed species is present, and no species or their critical habitat will be affected, then no further consultation or coordination is required. However, if any of the following apply, please contact our office for further consultation:

1. Designated critical habitat is present within the project area,
2. Suitable habitat for listed, candidate, or proposed species is present within the project area (see above for habitat descriptions for bat species), or
3. You determine that project activities may affect these species or their critical habitat (e.g., project occurs upstream or within a distance such that the species or habitat could be affected).

The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. For additional conservation measures that may benefit species identified in the enclosed list, please contact our office.

Other Considerations

Bald and Golden Eagles - Although the bald eagle has recently been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden

Eagle Act and the Migratory Bird Treaty Act. Should bald or golden eagles occur within or near the project area please contact our office for further coordination. For communication and wind energy projects, please refer to additional guidelines below.

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

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts and these can be found at http://www.fws.gov/habitatconservation/communicationtowers.html.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines, In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. In order to minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee's and the Service at http://www.aplic.org/uploads/files/2634/APPguidelines_final-draft_Aprl2005.pdf. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas known to support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow guidelines located at http://www.fws.gov/windenergy. In addition, please refer to the Service's Eagle Conservation Plan Guidance, located at http://www.fws.gov/windenergy/eagle_guidance.html, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

Next Steps

Should you determine that project activities may impact any of the natural resources described herein, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header.

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

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

Amy Salveter

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Burnham Island Sandbar Creation Project

Official Species List

Provided by:

Columbia Ecological Services Field Office
101 PARK DEVILLE DRIVE
SUITE A
COLUMBIA, MO 65203
(573) 234-2132

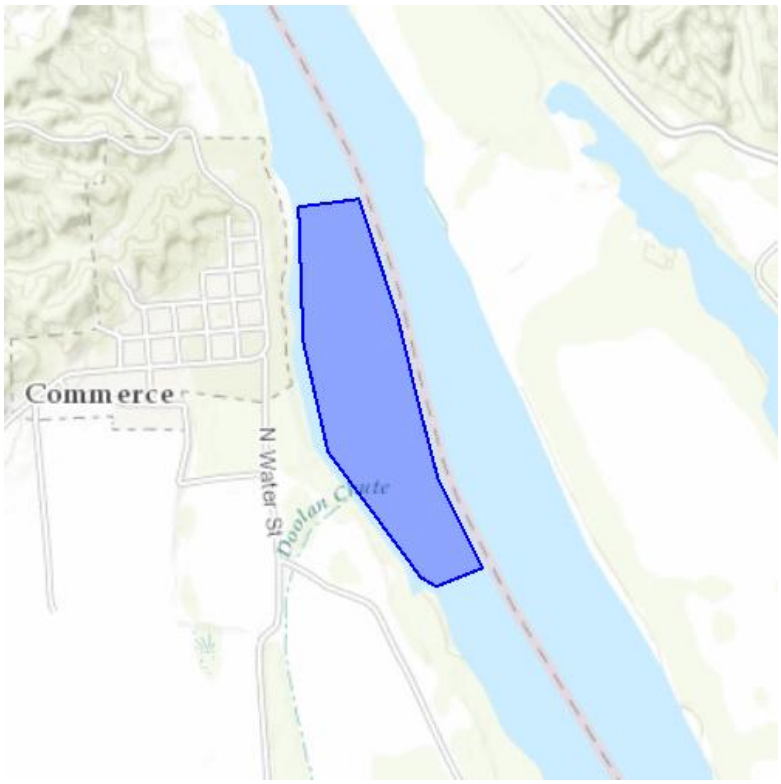
Consultation Code: 03E14000-2017-SLI-0296
Event Code: 03E14000-2017-E-00307

Project Type: DREDGE / EXCAVATION

Project Name: Burnham Island Sandbar Creation Project
Project Description: Middle Mississippi River (RM 38.9 – 39.4 R), Scott County, Missouri.
The proposed Federal action is implementation of an ephemeral island/sandbar creation project near Burnham Island in the MMR. The goal of the project is to restore habitat for two federally endangered species: the pallid sturgeon (Scaphirhynchus albus) and the interior least tern (Sterna antillarum). The project consists of using dredge disposal material to build ephemeral island/sandbar habitat in the MMR. Specifically, sediment would be dredged from within the navigation channel using a hydraulic dredge and deposited via flexible-floating dredge pipe (flex-pipe) between the river training structures on the right descending bank between river miles 38.9 – 39.4. Specifically, three depositional areas totaling approximately 350,000 ft2 would be brought to a target elevation of +16 LWRP. The required volume of dredge disposal material is estimated to be approximately 280,000 yd3.

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 (((-89.44175720214844 37.161068971992606, -89.44154262542725 37.15638329282207, -89.44051265716551 37.15255244883274, -89.43639278411865 37.1481741037536, -89.43574905395508 37.14786624182649, -89.43368911743164 37.14848196442746, -89.43570613861084 37.151628912764494, -89.43656444549559 37.15433107910877, -89.43742275238037 37.15723836542881, -89.43909645080566 37.16134257931966, -89.44175720214844 37.161068971992606)))

Project Counties: Scott, MO

Endangered Species Act Species List

There are a total of 4 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.

Fishes	**Status**	**Has Critical Habitat**	**Condition(s)**
Pallid sturgeon *(Scaphirhynchus albus)* Population: Wherever found	Endangered		
Mammals			
Gray bat *(Myotis grisescens)* Population: Wherever found	Endangered		
Indiana bat *(Myotis sodalis)* Population: Wherever found	Endangered		
Northern long-eared Bat *(Myotis septentrionalis)* Population: Wherever found	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Appendix A: FWS National Wildlife Refuges and Fish Hatcheries

There are no refuges or fish hatcheries within your project area.

Appendix B: NWI Wetlands

The U.S. Fish and Wildlife Service is the principal Federal agency that provides information on the extent and status of wetlands in the U.S., via the National Wetlands Inventory Program (NWI). In addition to impacts to wetlands within your immediate project area, wetlands outside of your project area may need to be considered in any evaluation of project impacts, due to the hydrologic nature of wetlands (for example, project activities may affect local hydrology within, and outside of, your immediate project area). It may be helpful to refer to the USFWS National Wetland Inventory website. The designated FWS office can also assist you. Impacts to wetlands and other aquatic habitats from your project may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal Statutes. Project Proponents should discuss the relationship of these requirements to their project with the Regulatory Program of the appropriate U.S. Army Corps of Engineers District.

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery and/or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Exclusions - Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Precautions - Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of

this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

The following NWI Wetland types intersect your project area in one or more locations. To understand the NWI Classification Code, see https://ecos.fws.gov/ipac/wetlands/decoder. To view the National Wetlands Inventory on a map go to http://www.fws.gov/wetlands/Data/Mapper.html.

Wetland Types	NWI Classification Code
Freshwater Emergent Wetland	PEMC
Freshwater Forested/Shrub Wetland	PFO1C
Freshwater Pond	PUBF
Riverine	R2UBH

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

March 1, 2017

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

Attn: Dr. Teri Allen

Dear Colonel Mitchell:

Thank you for the opportunity to review the Draft Environmental Assessment (EA) and Unsigned Finding of No Significant Impact (FONSI) for the proposed Burnham Island Sandbar Creation Biological Opinion Project located between Upper Mississippi River miles 38.9 and 39.4 in Scott County, Missouri. The proposed project includes ephemeral island/sandbar creation adjacent to Burnham Island using dredge disposal material from within the navigation channel. The material will be deposited between existing river training structures using the flexible-floating dredge pipe. The proposed project is being constructed to meet the requirements of the Reasonable and Prudent Alternative for the endangered pallid sturgeon (*Scaphirhynchus albus*) and the Reasonable and Prudent Measures for the interior least tern (*Sterna antillarum*) in the 2000 Biological Opinion for Operation and Maintenance of the 9-Foot Navigation Channel on the Upper Mississippi River System. 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 proposed project will be beneficial to the Mississippi River and biota dependent upon the river by improving habitat quality in this portion of river. The project will restore and enhance the quality of sandbar habitat within the Burnham Island area. Large river fish and other aquatic organisms will gain improved access to important habitats for several life stages, such as spawning, rearing and over-wintering. These areas will also provide an important feeding area for aquatic organisms and serve as a production area for small fish and invertebrates that other terrestrial organisms feed upon.

Threatened and Endangered Species

To facilitate compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, Federal agencies are required to obtain, from the Fish and Wildlife Service (Service), information concerning any species, listed or proposed to be listed, which may be present in the area of a proposed action. The list for the proposed project area includes the endangered gray bat (*Myotis grisescens*), endangered Indiana bat (*Myotis sodalis*), endangered least tern, endangered pallid sturgeon, threatened northern long-eared bat (*Myotis septentrionalis*), threatened piping plover (*Charadrius melodus*), and threatened rufa red knot (*Calidris canutus rufa*). There is no designated critical habitat in the project area at this time.

The Corps has determined that the project will have "no effect" on the gray bat, Indiana bat, and northern long-eared bat. 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 EA indicates that short-term effects may occur during construction but are limited and the proposed project has been designed to improve and provide habitat for the least tern and pallid sturgeon and may be beneficial to the piping plover and rufa red knot, thus the Corps has determined the proposed project is not likely to adversely affect the least tern, pallid sturgeon, piping plover and rufa red not. The Service concurs that the proposed project is not likely to adversely affect these species. 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.

As designed, the proposed project will have several features beneficial to pallid sturgeon and least tern, including the creation of island/submerged sandbar habitat. Therefore, we also concur that the proposed project meets the requirements of the Reasonable and Prudent Alternative for the Corps of Engineers to implement aquatic habitat restoration measures that may reasonably be expected to benefit pallid sturgeon and the Reasonable and Prudent Measures for the Corps of Engineers to implement measures to minimize the incidental take of least terns. Pre-project fisheries and bathymetry monitoring have been completed for the proposed project and the Service supports similar post-project monitoring to evaluate the potential benefit of the project. The Service recommends continued coordination regarding the post-project monitoring plan.

Conclusion

Based on information in the EA, it appears that proposed project activities will be conducted in a manner to minimize and avoid impacts to threatened and endangered species and will be beneficial to a variety of fish and wildlife resources. Therefore, the Service has no objection to a Finding of No Significant Impact for this activity. The Service fully supports the completion of planning for this proposed project, and its subsequent construction. Thank you for the opportunity to provide comment on the EA and Draft 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 (Vitello)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 7
11201 Renner Boulevard
Lenexa, Kansas 66219

FEB 2 3 2017

Shane Simmons
U.S. Army Corps of Engineers, St. Louis District
ATTN: CEMVP-PD-P
1222 Spruce Street
St. Louis, Missouri 63103

Dear Mr. Simmons:

The U.S. Environmental Protection Agency has reviewed the U.S. Army Corps of Engineers' 2017 Environmental Assessment concerning the Burnham Island Sandbar Creation Project, Middle Mississippi River (RM 38.9 – 39.4 R), Scott County, Missouri. Our comments in this letter are provided in accordance with our responsibilities under the National Environmental Policy Act, the Council on Environmental Quality's National Environmental Policy Act Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

The EA evaluates impacts associated with the proposed creation of ephemeral islands and the Middle Mississippi River. The Corps anticipates the design elevation for the sandbars will last for a minimum of two years. Given the paucity of habitat construction projects in the past and the special navigational constraints within the Middle Mississippi River, the EPA strongly supports continuing efforts by the Corps, the U.S. Fish and Wildlife Service and state agencies within Illinois and Missouri to restore sustainable habitat structure within this reach.

Fisheries and Aquatic Habitat

The EPA recommends the EA include quantitative measures of success associated with the proposed project. For example, monitoring targets should be established (e.g., the MMR fish assemblage referenced in the EA and/or the pallid sturgeon). Further, quantifiable and measurable success criteria (e.g., evidence of use of the newly-created sandbars by target species or evidence of target species' population increase) should be established for this project. The EPA recommends monitoring and measures of success should be specified in the EA. Too often, habitat restoration projects lack adequate support for an adaptive management approach when monitoring programs and measures of project of success are omitted or are vaguely discussed.

The EA indicates aquatic habitat within the project area would be improved because bathymetric diversity would be enhanced by the creation of ephemeral islands and sandbars. Because the preferred alternative would create a localized mosaic of main channel sand bar habitat thought to be utilized by the Federally-endangered pallid sturgeon, the project would allow Corps to comply with the requirements of the Service's Biological Opinion and the Endangered Species Act. The EPA recommends the Corps address whether the proposed habitat will supplement other existing habitat suitable for the pallid sturgeon in a cumulative manner. Specifically, the proposed mesohabitat features

of the proposed project could serve to "link" segments of suitable habitat for pallid sturgeon migration similar to wildlife corridors for terrestrial species, creating even more value to this individual project.

Water Stages

Section 3.2, Stages, displays the average annual hydrograph from 2005-2014 from the Thebes rated gage and compares water elevation to the approximate elevation of the offset dikes and proposed sandbars. The ten-year average annual hydrograph illustrates the water level is typically above the offset dikes, and thus the proposed sandbar's elevation, in the project area during the period of March through July. The EA also explains that the availability of sandbar habitat to least terns for breeding, nesting, and rearing of offspring from May 15 to August 31 is a key population ecology variable. Creation of sandbar nesting habitat could improve the potential for successful reproduction and recruitment of the Federally-endangered least tern in this area. However, based on the annual hydrograph and the breeding season for least terns, it is possible that the proposed project, dependent on water levels, could convey little benefit to the listed bird. The EPA requests that the Corps clarify whether it projects that this project might provide benefit to the least tern during the breeding season or whether it is more likely that the sandbars will be submerged during that time period. In the case of the latter scenario, the Biological Opinion's Reasonable and Prudent Measures to minimize incidental take of the least tern would need to be fulfilled at another location in the UMRS.

The EPA appreciates the opportunity to provide comments on the proposed project. Please send future NEPA documents pertaining to this project as they become available. Should you have any questions about this letter, please contact Larry Shepard of my staff at 913-551-7441 or via email at shepard.larry@epa.gov.

Sincerely,

Josh Tapp, Deputy Director
Environmental Sciences and Technology Division

cc: Amy Salveter, Ecological Services Field Office, USFWS, Columbus, Missouri
Kathy Kowal, USEPA Region V

Response to February 23, 2017 Environmental Protection Agency Region 7 Comment Letter

Comment 1: *The EPA recommends the EA include quantitative measures of success associated with the proposed project. For example, monitoring targets should be established (e.g., the MMR fish assemblage referenced in the EA and/or the pallid sturgeon). Further, quantifiable and measurable success criteria (e.g., evidence of use of the newly-created sandbars by target species or evidence of target species' population increase) should be established for this project. The EPA recommends monitoring and measures of success should be specified in the EA. Too often, habitat restoration projects lack adequate support for an adaptive management approach when monitoring programs and measures of project of success are omitted or are vaguely discussed.*

Response: The District has included Project Monitoring (Section 2.4) in the Final Environmental Assessment. Section 2.4 summarizes the physical and biological sampling protocols that have been developed for the project. However, specific success targets have not been established for this project. Currently, the District's use of the flex-pipe to construct ephemeral/sandbar habitat is still in the pilot study phase, in which data and information on the efficacy of the flex-pipe's utility is still being collected. The data collected through this project's monitoring plan will add to this knowledge base, and perhaps guide the development of success criteria for future flex-pipe sandbar creation projects.

Comment 2: *The EA indicates aquatic habitat within the project area would be improved because bathymetric diversity would be enhanced by the creation of ephemeral islands and sandbars. Because the preferred alternative would create a localized mosaic of main channel sand bar habitat thought to be utilized by the Federally-endangered pallid sturgeon, the project would allow Corps to comply with the requirements of the Service's Biological Opinion and the Endangered Species Act. The EPA recommends the Corps address whether the proposed habitat will supplement other existing habitat suitable for the pallid sturgeon in a cumulative manner. Specifically, the proposed mesohabitat features of the proposed project could serve to "link" segments of suitable habitat for pallid sturgeon migration similar to wildlife corridors for terrestrial species, creating even more value to this individual project.*

Response: This project was not designed to link patches of suitable pallid sturgeon habitat, nor serve as an aid to migration. Based on the project location, footprint, aquatic habitat in the area, and the river planform of the area, the District has determined that no such benefits can be claimed as a result of this project. However, under the Biological Opinion Program, the District hopes to develop projects that serve in this capacity, linking segments of suitable habitat, aiding upstream migration, and ultimately enhancing pallid sturgeon habitat in a "cumulative manner" throughout the MMR.

Comment 3: *Section 3.2, Stages, displays the average annual hydrograph from 2005-2014 from the Thebes rated gage and compares water elevation to the approximate elevation of the offset dikes and proposed sandbars. The ten-year average annual hydrograph illustrates the water level is typically above the offset dikes, and thus the proposed sandbar's elevation, in the project*

area during the period of March through July. The EA also explains that the availability of sandbar habitat to least terns for breeding, nesting, and rearing of offspring from May 15 to August 31 is a key population ecology variable. Creation of sandbar nesting habitat could improve the potential for successful reproduction and recruitment of the Federally endangered least tern in this area. However, based on the annual hydrograph and the breeding season for least terns, it is possible that the proposed project, dependent on water levels, could convey little benefit to the listed bird. The EPA requests that the Corps clarify whether it projects that this project might provide benefit to the least tern during the breeding season or whether it is more likely that the sandbars will be submerged during that time period. In the case of the latter scenario, the Biological Opinion's Reasonable and Prudent Measures to minimize incidental take of the least tern would need to be fulfilled at another location in the UMRS.

Response: There is potential for the project to provide nesting habitat for least tern, dependent on river stages during the least tern breeding period. However, based on the data from the Thebes rated gage, it is more likely that the created sandbars will be submerged during the least tern breeding period. Small changes to the language in the Final EA have been made to reflect this, and emphasize that the likelihood of the project directly benefiting least tern is low.

Appendix B. Distribution List

Adrian, D
Amato, Joel
Andria, Kathy
Atwood, Butch
Banner Press
Barnes, Robert
Bax, Stacia
Bellville, Colette
Beres, Audrey
Berland, Paul
Bernard Heroff
Boaz, Tracy
Boehm, Gerry
Brescia, Chris
Brown, Doyle
Morrison, Bruce
Buan, Steve
Buffalo, Jonathan
Burlingame, Chuck
Caito, J
Campbell-Allison, Jennifer
Carney, Doug IL DNR
Cecil
Ceorst
Chicago Commods
Chief John Red, Osage Tribe
City of Portage des Sioux
Clare Mannion
Clements, Mark
Coder, Justin S
Collum, Joseph
Congressman Clay
Congressman Sam Graves
Congressman Smith
Corker, Ashley
Cruse, Lester
Curran, Michael
Dave Davis
Deel, Judith
Deutsch, Charles W (Charlie)
Diedrichsen, Mike IDNR, OWR
District Director Senator Blunt
Docks
Dotts, Glenn
Dougherty, Mark
Ebey, Mike
Elizabeth Hubertz
Elmestad, Gary
Engle, Lance
Fabrizio, Christi
Favilla, Christy
Foster, Bill
Fung, Jenny
G, Jeff
Genz, Greg
Glenn, S
Goode, Peter
Gordon, David
Great Lakes Dredge & Dock
Grider, Nathan
Hall, Mike
Hammond, Cheryl
Hanke Terminals
Hanneman, M
Hansens Harbor
Harding, Scott
Held, Eric
Henleben, Ed
Herrington, Karen
Hilburn, Craig
HMT Bell South
Hoppies Marine
Howard, Chuck
Hunt, Henry
Hussell, B
IL SHPO
Jaci Winship
Jamison, Larry
JBS Chief
Jefferson Port Authority
Jeffries, June
Joeana Middleton, Sen. McCaskill:
Johnson, Frank
Joseph Standing Bear Schranz
Kenneth Miller

Knowles, Kim
Kristen, John
Lamm, Dawn
Lange, James
Lauer, Steve
Leary, Alan
Ledwin, Jane
Lee, Richard J
Lipeles, Maxie
Louis Marine
Malone, Pat
Manders, Jon
Marquardt, Shauna
Matthew Mangan
Mauer, Paul
Mccollum, Harold R
McPeek, Kraig
MDNR Land Rec
Medina, Santita
Melgin, Wendy
Miller, Jeff
Missouri Corn Growers Association
Morgan, Justin
Muench, Lynn
Muir, T
Myers, Dillen J
Nelson, Lee
Novak, Ron
O'Carroll, J
Patrick Baldera
Paurus, Tim
Pehler, Kent
Popplewell, Mickey
Porter, Jason
Reitz, Paul
Roark, Bev
Rose Schulte
Rowe, Kelly
Salty, TRJ
Sauer, Randy
SEMO
Senator Roy Blunt
Shoulberg, J
Simmons, Bryan
Skrukrud, Cindy
Slay, Glen
Smith, David
Southern Illinois
Spoth, Robert
Stahlman, Bill
Staten, Shane
Sternburg, Janet
Stokes, David
Stout, Robert
Strauser, Deanne M
Strole, Todd
Sullivan, Shawn F
SUMR Waterways
Taylor, Susan
Teah, Philip
Todd, Brian
Tow Inc
Tricia Lavalle
Tyson, J
Urban, David
U.S. Congressman Enyart
USEPA Region 7
Vest, John C
Villwock, Jason
Vitello, Matt
Walker, Brad
Welge, Owen
Werner, Paul
Wilmsmeyer, Dennis
Wkn, Dave
York Bridge Co.
Zupan, T