Appendix J
Biological Assessment

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UPPER MISSISSIPPI RIVER RESTORATION SYSTEM
DRAFT FEASABILITY REPORT
WITH INTEGRATED ENVIRONMENTAL ASSESSMENT

HARLOW ISLAND HABITAT REHABILIATION
AND ENHANCEMENT PROJECT

MIDDLE MISSISSIPPI RIVER MILES 140.5 THROUGH 144.0
JEFFERSON COUNTY, MISSOURI

APPENDIX J
BIOLOGICAL ASSESSMENT

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1 INTRODUCTION

1.1 Purpose

The U.S. Army Corps of Engineers, St. Louis District (USACE) is preparing a Feasibility Report with Integrated Environmental Assessment for implementation of the Harlow Island Habitat Rehabilitation and Enhancement Project (HREP), referred to as the Project. The primary goal of this ecosystem study is to restore and improve the quality and diversity of backwater, floodplain forest, and wetland ecosystem resources. The purpose of this Draft Feasibility Report with Integrated Environmental Assessment (EA), including the draft unsigned Finding of No Significant Impact (FONSI), is to evaluate the proposal for the UMRR-HREP at Harlow Island. The Draft Feasibility Report and Integrated EA meet Corps of Engineers planning guidance and meet NEPA requirements. The draft feasibility report presents a detailed account of the planning, engineering, construction details, and environmental considerations.

The need for this Project is described fully in the draft feasibility report, and only briefly summarized here. Secondary side channels, backwaters, ridge and swale habitat, and floodplain forest have been identified as habitat needs for the Middle Mississippi River (MMR) (Theiling et al., 2000). Existing backwater side-channel habitat on Harlow Island is generally shallow, turbid, and has limited connectivity with the main channel, which are important habitat characteristics required for functional year-round aquatic habitat. Without action, the existing backwater habitat quality would continue to decline impacting the survival and recruitment of riverine fish species. In addition, the continued sedimentation would lead to conversion of aquatic cover to land cover translating to a quantitative loss of habitat (resting, foraging, and breeding) for migratory and resident wildlife Furthermore, floodplain forest within the MMR have been adversely affected due to past land human-induced actions and have resulted in loss resource for resident and migrant wildlife. The need for this Project is now since there is an opportunity to restore a diverse suite of habitats that have all been identified as a habitat need for the MMR within the Project Area. The restoration of ecosystem structure and function at the Project would contribute to restoring ecological health and resiliency of the Upper Mississippi River System. Refer to the main report for more details.

The purpose of this Biological Assessment (BA) is to review the proposed Harlow Island HREP in sufficient detail to evaluate whether the proposed actions may affect any federally threatened, endangered, proposed, or candidate species identified by the U.S. Fish and Wildlife Service (USFWS). This BA is prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act (15 U.S.C. 1536 (c)) and applicable guidance documents. The BA includes the description of the Project Area, proposed actions, species accounts and status, effects of the proposed actions, and effects determinations.

1.2 Proposed Action

The proposed Federal action involves selecting and recommending one of the alternatives for implementation to restore ecosystem structure and function at Harlow Island HREP.

1.3 Project Description

USACE is preparing to implement a habitat rehabilitation and enhancement project at Harlow Island, located on the right descending bank of the Mississippi River in Jefferson County, Missouri. The project is in the Middle Mississippi River (MMR) between river miles 140.0 and 144.5. The Project Area is approximately 1,224 acres of floodplain forest, and backwater habitat (Figure 1).

The proposed alternative plan involves dredging material from the Harlow Island backwater and placing rock river training structures to create a total of 39.19 acres of backwater habitat.

Dredging material and onsite borrow would be used to construct a sediment deflection berm to enhance soils suitable for hard mast trees for approximately 719 acres. Elevated ridge habitat would be constructed at a 20% annual chance of exceedance (ACE) elevation and 10 % ACE elevation, totaling approximately 33.5 acres and 13.4 acres, respectively. The sediment deflection berm and the ridges would be reforested with hard mast trees species. Approximately 83.3 acres of swale wetland features would be restored within the Project Area (Figure 2).

The details of the proposed plan are further described below.

1.3.1 Harlow Backwater

The proposed backwater feature would have an excavated depth of the bottom of the backwater approximately 23.5 ft. deeper than the existing bottom with a final elevation of 346.5 ft NAVD88. Removal of one rock river training structures within the excavation area would be completed. The water depth of the proposed backwater would be at least 5 ft. deep 90% of the time and have water approximately 96% of the time. The bottom width would be approximately 40 ft. with side slopes of 1 ft. vertical on 3 ft. horizontal, extending approximately 90 ft. on each side. This would be accomplished by dredging and excavating approximately 17.7 acres in total. Additionally, the placement of three rock training structures scour an 21.1 acres during high flow events over the course of the following 5 to 10 years, depending on hydrology. This feature is most effective by maximizing the fisheries habitat benefits throughout the entire backwater. Excavated material would be used for construction of the sediment deflection berm and ridges.

1.3.2 Sediment Deflection Berm

Excavated material from within the backwater and swale wetlands would be used to construct the sediment deflection berm. The material would be placed behind the existing remnant agricultural levee within the Project Area toward the upstream portion, then extending downstream along the landward side of the dredged backwater. The proposed feature would have a 1:3 slope on the exterior with a 1:6 slope on the interior to minimize scouring when overtopped by flood events. The top of the berm would be constructed to a 10% ACE elevation of 397 to 399 NAVD 88 at a length of 14,000 feet long. The cross-sectional width of the sediment deflection berm would be approximately 90 feet wide at the base. The berm would be constructed on approximately 23.8 acres. Reforestation of hard mast tree species would be planted on the sediment deflection berm.

1.3.3 Ridge Habitat

The ridge features would be constructed to approximately 397 NAVD 88, a 10% ACE, at the top with a side slope of 1:4 to a 20% ACE, and a 1:10 side slope from 20% ACE to a 10% ACE elevation. In total these five ridges account for approximately 59.8 acres. Reforestation of hard mast tree species would be planted on the top and side slopes of the ridges.

1.3.4 Swale Habitat

The swale wetland features would create approximately 65.2 acres of wetland habitat within the Project Area. These features would be approximately 6 feet deep, with the bottom elevation at approximately 358 ft. NAVD 88. They were designed to follow natural low elevations within the Project Area and would have a slope of approximately 1:20. Approximately 64.1 acres of forest would be cleared to construct these features.

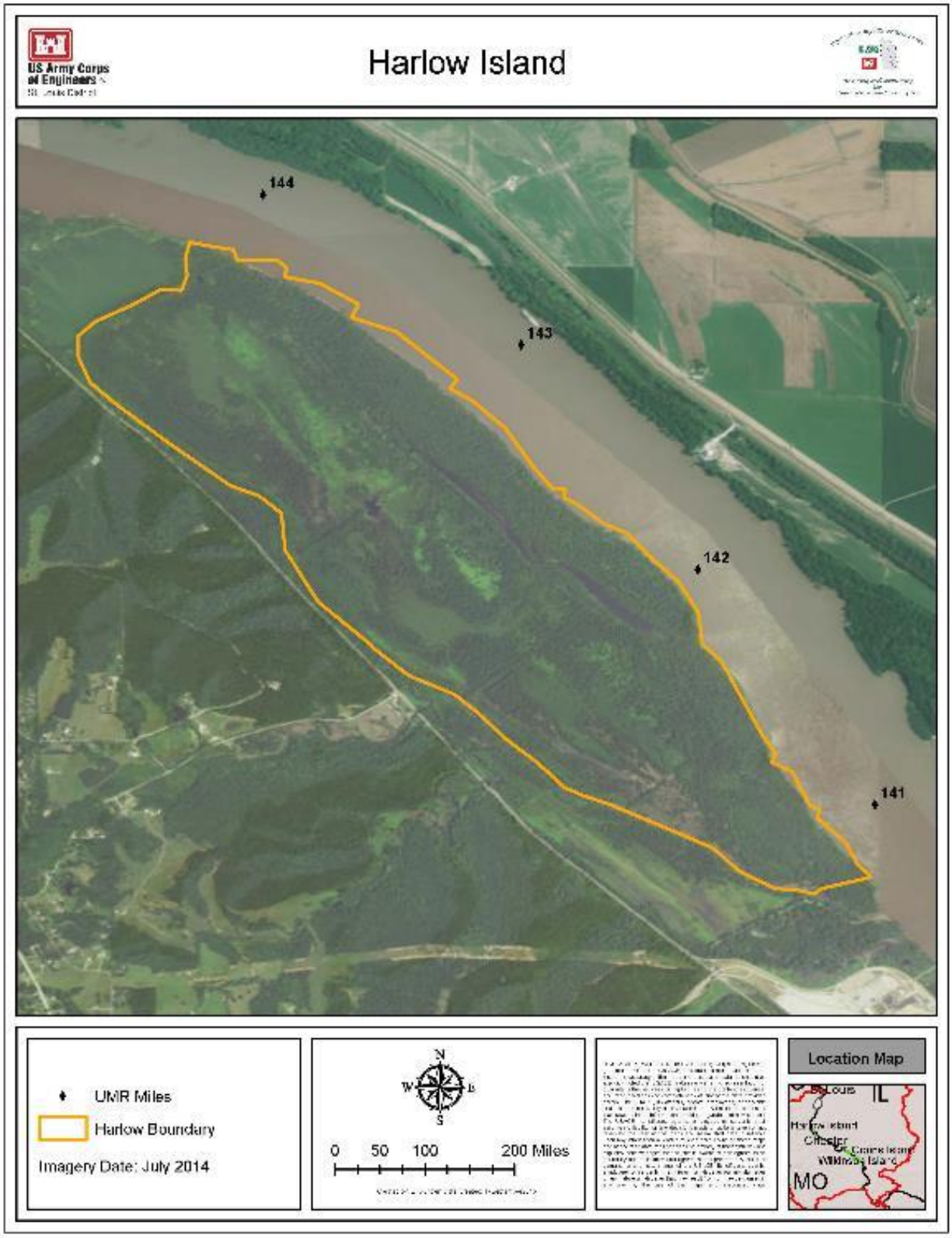

Figure 1. Harlow Island HREP Project Location and Vicinity

Figure 2. Proposed Plan at Harlow Island HREP

2 SPECIES/HABITAT CONSIDERED IN THIS CONSULTATION

The Corps requested the official species via the ECOS-IPaC website (http://ecos.fws.gov/ipac/) on 23 January 2018. U.S. Fish and Wildlife Service provided a list of 4 federally threatened and endangered species that could potentially be found in the area (Jefferson County, Missouri). In addition, in correspondence on 20 February 2018 with USFWS Ecological Services office in Marion, Illinois, which serves as the point of contact for this project, requested the least tern be added to this Biological Assessment. The 5 species, federal protection status, and habitat can be found in Table 1. No critical habitat is located in the Project Area.

Table 1. Federally Listed Threatened and Endangered Species Potentially Occurring in the Project Area

Species	Status	Habitat
Least tern (interior population) (*Sterna antillarum*)	Endangered	Large rivers - nest on bare alluvial and dredge spoil islands
Indiana bat (*Myotis sodalis)*	Endangered	Hibernates in caves and mines; maternity & foraging habitat: small stream corridors with well-developed riparian woods; upland & bottomland forests
Northern long-eared bat (*Myotis septentrionalis*)	Threatened	Hibernates in caves and mines; swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
Gray bat (*Myotis grisescens)*	Endangered	Caves year-round (winter hibernacula and summer roosting). In the summer gray bats forage along rivers lakes, and creeks, and may roost under bridges.
Pallid sturgeon (*Scaphirhynchus albus*)	Endangered	Mississippi and Missouri Rivers

3 MEASURES TAKEN TO AVOID IMPACT TO LISTED SPECIES

During the planning process for the Harlow HREP, the planning team considered how project measures could impact listed species. Efforts have been made to reduce direct, indirect, and cumulative impacts to listed species.

3.1 Conservation Measures

Conservation measures are actions to benefit or promote the recovery of a listed species that a Federal agency includes as an integral part of the proposed action and that are intended to avoid, minimize, or compensate for potential adverse effects of the action on the listed species. As such, mandatory measures below will be incorporated into every USACE action that fails within this consultation framework.

The following bat conservation measures are proposed for the proposed action alternative to help minimize effects to currently listed bat species within the Project.

1. All tree clearing resulting from the USACE action will occur during the inactive season from November 1 to March 31 unless negative presence/probable absence survey results were obtained for the action area through appropriate surveys approved by the U.S. Fish and Wildlife Service (USFWS).
2. If the project is located in a karst area and will involve construction methods that may cause deep ground disturbance, the USACE will require a cave search be conducted to determine if any caves are present in the action area that would be considered suitable habitat for bats and/or are currently or formerly used by listed bats.
3. During clearing, dead trees, split trees, trees that have cavities, and trees with exfoliating bark would be favored for retention where possible.

4. Indiana bat habitat assessments and presence/absence surveys would be conducted as needed per USFWS requests.
5. Conservation measures as outlined in the Northern Long-Eared Bat 4(D) Rule (USFWS 2016) would be followed. Conservation measures include:
    a. The year-round application of a no 0.25-mile radius no cutting buffer around known northern long-eared bat hibernacula
    b. No cutting of known maternity roost trees and other trees within a 150-foot radius around a known maternity roost tree during the pup season (1 June through 31 July).

4 IMPACT ASSESSMENT

The following section includes a status description of each species and how it will be affected by Project elements as well as the determination of effects for each species. The effects determination took into account implementation of the conservation measures listed above.

4.1 Least Tern (*Sterna antillarum)*

4.1.1 Status

The federally endangered least tern is a colonial, migratory waterbird which resides and breeds along the Mississippi River during the spring and summer. Least terns arrive on the Mississippi River from late April to mid-May. Reproduction takes place from May through August, and the birds migrate to the wintering grounds in late August or early September (USACE, 1999). Sparsely vegetated portions of sandbars and islands are typical breeding, nesting, rearing, loafing, and roosting sites for least terns along the MMR. Nests are often at higher elevations and well removed from the water's edge, a reflection of the fact that nesting starts when river stages are relatively high (USACE, 1999). In alluvial rivers, sandbars are dynamic channel bedforms. Individual sandbars typically wax and wane over time as fluvial processes and the construction of river engineering works adjust channel geometry according to varying sediment load and discharge. There is limited data on site fidelity for Mississippi River least terns. Given the highly dynamic bed and planform of the historic river, ability to return to previously used colony sites is not likely a critical life history requirement. The availability of sandbar habitat to least terns for breeding, nesting, and rearing of chicks from 15 May to 31 August is a key variable in the population ecology of this water bird. Only portions of sandbars that are not densely covered by woody vegetation and that are exposed during the 15 May to 31 August period are potentially available to least terns (USACE, 1999). The size of nesting areas and the number of nests within a colony depend on water levels and the extent of associated sandbars (Sidle & Harrison, 1990). Sandbars have a greater possibility of colonization by least terns if river levels remain low during the breeding season. Smith and Renken (1991) found that sites were more likely to be used by interior least terns in the Mississippi River Valley adjacent to Missouri if sites were continuously exposed for at least 100 days during the breeding season.

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 stem river habitats or backwater lakes or overflow areas. Radiotelemetry studies have shown that terns will travel up to 2.5 miles to fish (Sidle & Harrison, 1990; USACE, 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 and eddies along natural and revetted banks, and at "run outs" from floodplain lakes where forage fish may be concentrated (USACE, 1999).

Although no records of least tern occurrences exist within the Project Area, it is assumed that they could utilize the area for foraging during migration through the MMR corridor.

4.1.2 Effects Determination

Impact of No Action Alternative – No sandbars exist within the Project Area. Therefore, it is anticipated that the No Action Alternative would have ***no effect on the least tern***.

Impacts of Proposed Federal Action – Direct adverse effects from implementing proposed project are not anticipated. No sandbars exist within the Project Area; however, sandbars upstream and downstream are present within the vicinity. No least tern nesting has been documented in this area. However, least terns could utilize these areas during migration. Effects associated with construction activities such as increased noise, turbidity, are localized and temporary in nature. Therefore, the Project ***may affect but is not likely to adversely affect the least tern***.

4.2 Indiana Bat (*Myotis sodalis*)

4.2.1 Status

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

Disturbance and vandalism of caves, improper cave gates and structures, natural hazards, such as flooding or freezing, microclimate changes, land use changes in maternity range, chemical contamination are the leading causes of population decline in the Indiana bat (USFWS, 2000; USFWS, 2004). To avoid impacting this species, tree clearing activities should not occur during the period of 1 April to 31 October.

No suitable hibernation habitat exists within the Project Area. Suitable summer foraging habitat exists within the proposed Project Area. See Section 7, Indiana Bat Habitat Assessment for more details.

4.2.2 Effects Determination

Impact of No Action Alternative - Under the No Action Alternative, the forest community with limited age structure and diversity in the Project Area would persist into the near future. However, given the even-aged forest community limited in species and structural diversity, available suitable Indiana bat habitat would not persist into the near future. Given the proximity to adjacent upland forest habitat, Indiana bats that could be present in the Project Area would likely relocate to suitable habitat within the proximity. Therefore, this alternative ***may affect but is not likely to adversely affect the Indiana bat***.

Impacts of Proposed Federal Action – The hard mast forest restoration portion of the

Project as discussed would improve habitat for the Indiana bat. Although approximately 158.7 acres of early successional forest would be cleared for construction, which could serve as potential foraging habitat for the Indiana bat, approximately 83.6 acres would be reforested with hard mast species. In addition, the sediment deflection berm would improve soil conditions for approximately 724.9 acres of forested areas to allow for successful recruitment of hard mast trees over time, thereby improving the overall forest community over a longer period with increased species, age, and structural diversity to yield suitable roost habitat through time and into the future. Further, during clearing, dead trees, split trees, trees that have cavities, and trees with exfoliating bark would be favored for retention. Tree clearing associated with the project would occur during the non-roost season, April 1 through October 31. Areas that have known roosts would be delineated and avoided. Indiana bat habitat assessments and presence/absence surveys would be conducted as needed per USFWS requests. In addition, the backwater, swale features would improve approximately 62.5 acres of foraging habitat for the Indiana bat as they would be composed of areas with standing water that would be conducive for drinking water as well as support aquatic insects that would be utilized for forage. Further, as described in Section 5, Indiana Bat Habitat Assessment, tree clearing area accounts for only 0.03% of the total available foraging habitat within a 5.0 mile radius. Several components could have site-specific impacts on Indiana bats and Indiana bat habitat but are not anticipated to individually or cumulatively have an adverse impact on the population as a whole. Therefore, we conclude that the Project ***may affect but is not likely to adversely affect the Indiana bat.***

4.3 Northern Long-Eared Bat (*Myotis septentrionalis*)

4.3.1 Status

The northern long-eared bat (*Myotis septentrionalis*) 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. Summer habitat for the northern long-eared bat includes a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields, and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches diameter at breast height (DBH) that have exfoliating bark, cracks, crevices, and/or cavities), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit characteristics of suitable roost trees and are within 1,000 feet of other forested/wooded habitat. The northern long-eared bat has also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat. Northern long-eared bats typically occupy their summer habitat from mid-May through mid-August each year and the species may arrive or leave some time before or after this period. 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.

The Project Area does not have suitable hibernation habitat, but many habitats suitable for foraging do exist. See Section 7, Indiana Bat Habitat Assessment for more details.

4.3.2 Effects Determination

Impact of No Action Alternative - Under the No Action Alternative, the forest community with limited age structure and diversity in the Project Area would persist into the near future.

Given the proximity to adjacent upland forest habitat, northern long-eared bats that could be present in the Project Area would likely relocate to suitable habitat within the proximity. Therefore, this alternative ***may affect but is not likely to adversely affect the northern long-eared bat.***

Impacts of Proposed Federal Action – Implementation of this project may affect the NLEB population. Conservation measures as outlined in the Northern Long-Eared Bat 4(D) Rule (USFWS 2016) would be followed. Conservation measures include: The year-round application of a no 0.25-mile radius no cutting buffer around known northern long-eared bat hibernacula; and no cutting of known maternity roost trees and other trees within a 150-foot radius around a known maternity roost tree during the pup season (1 June through 31 July). However, there are no project effects beyond those previously disclosed in the USFWS range-wide programmatic biological opinion on implementing the final 4(d) rule dated January 5, 2016, signed by Lynn Lewis. Any taking that may occur incidental to this project is not prohibited under the final 4(d) rule (50 CFR §17.40(o)). This project is consistent with the description of the proposed action in the programmatic biological opinion, and activities that do not require special exemption from taking prohibitions applicable to the NLEB (see Sub Appendix C – NLEB 4(d) Rule Streamline Consultation Form, for more details; therefore, the programmatic biological opinion ***satisfies the Corps of Engineer's responsibilities under ESA section 7 (a)(2) relative to the NLEB for this project***.

4.4 Gray Bat (*Myotis grisescens*)

4.4.1 Status

The gray bat (*Myotis grisescens*) occupies a limited geographic range in limestone karst areas of the southeastern United States, including Missouri. With rare exception, the gray bat roost in caves year-round. In winter, most gray bats hibernate in vertical (pit) caves with cool, stable temperatures below 10 degrees Celsius. Summer caves, especially those used by maternity colonies, are nearly always located within a kilometer (0.6 mile) of rivers or reservoirs over which the bats feed. The summer caves are warm with dome ceilings that trap body heat. Most gray bats migrate seasonally between hibernating and maternity caves, and both types of caves are located in Missouri. Gray bats are active at night, foraging for insects over water or along shorelines, and they need a corridor of forest riparian cover between roosting caves and foraging areas. They can travel as much as 20 kilometers (12 miles) from their roost caves to forage.

Gray bats are endangered largely because of their habitat of living in large numbers in only a few caves, thus making the species vulnerable to human disturbance and habitat loss or modification. Disturbance of gray bats in their caves during their hibernation can cause them to use their energy reserves and could lead to starvation. Disturbances to their caves during their nursing season (June and July) can frighten females causing them to drop non-volant pups to their death in panic to flee from the intruder. Additionally, many important caves that have been historically used by gray bats have been inundated by reservoirs. The commercialization of caves, and alterations of the air flow, temperature, humidity, and amount of light can make the cave unsuitable habitat for gray bats and drive bats away.

The fatal bat disease, white-nose syndrome (WNS), has not yet been documented to adversely affect the gray bat. However, because gray bats are cave obligates, and considering how WNS has decimated other cave-dwelling bat species, WNS could be another significant threat to the gray bat.

Several limestone mining operations exist within 20 miles of the Project Area. However, no hibernacula or maternity caves have been documented within or adjacent to the Project Area.

4.4.2 Effects Determination

Impact of No Action Alternative – No caves would be impacted under the No Action Alternative. Given the even-aged forest community limited in species and structural diversity, available foraging habitat may be impacted in the future. However, these impacts would be localized and foraging habitat would exist outside of the Project Area. Therefore, there would be ***no effect on the gray bat***.

Impacts of Proposed Federal Action – No caves would be impacted under any of the considered alternatives. Impacts to foraging habitat would be similar to that of the Indiana bat as discussed in 3.2.2. These impacts of the proposed federal action could have site-specific impacts on gray bat and gray bat habitat but are not anticipated to individually or cumulatively have an adverse impact on the population as a whole. Therefore, the Project ***may affect but is not likely to adversely affect the gray bat.***

4.5 Pallid Sturgeon (*Scaphirhynchus albus*)

4.5.1 Status

The Pallid Sturgeon is found in the Mississippi River downstream of its confluence with the Missouri River. Pallid Sturgeon forage for insects, crustaceans, snails, clams, and fish along the bottom of large rivers (USFWS 2016). These fish are most frequently caught over a sand bottom, which is the predominant bottom substrate within the species' range on the Mississippi River. Tag returns have shown that the species may be using a range of habitats in off-channel areas and tributaries of the Mississippi River. Loss of habitat has occurred due to anthropogenic changes which has ultimately decreased the availability of spawning habitat, reduced larval and juvenile rearing habitat, availability of seasonal refugia, and availability of foraging habitat. Documentation of catches of the pallid sturgeon exist immediately adjacent to Harlow Island near the tips of several wing dikes.

4.5.2 Effects Determination

Impact of No Action Alternative – The existing backwater at Harlow Island is disconnected and dry with the exception of during flood events. The current channel bottom at Harlow Island is exceeded only 18% of the time. The average flows are well below the values needed to inundate the current backwater area. Under the No Action Alternative, connectivity between the main-channel of the MMR would not be improved. The backwater would continue to become isolated and disconnected, other than during high flow events, which would limit the pallid sturgeon from accessing this off-channel habitat. Although under this scenario, the pallid sturgeon would be further limited in its habitat availability, overall it is not anticipated to individually or cumulatively have an adverse impact on the population as a whole. Therefore, the No Action Alternative would have ***no effect on the pallid sturgeon***.

Impacts of Proposed Federal Action – The backwater feature was developed to directly benefit fisheries resources, which would thereby improve pallid sturgeon habitat. The proposed backwater feature would create at least 5 feet of depth 90% of the time and at least 10 feet of depth 65% of the time. Improved topographic diversity and depth and connectivity to the main channel of the MMR would improve pallid sturgeon access to this important off-channel habitat for longer durations throughout its lifecycle. Increased depth, flow, and improved temperatures during the growing season as well as overwintering opportunities would increase pallid sturgeon habitat in the MMR, which is currently limited. The Project may have temporary short-term adverse impacts during construction on water quality and increased turbidity. However, overall these adverse impacts would likely not have an effect on the pallid sturgeon. Therefore, we conclude that the Project ***may affect, but is not likely to adversely affect the pallid sturgeon***.

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7 INDIANA BAT HABITAT ASSESSMENT SUMMARY

On March 7 and 8, 2018, a USACE Wildlife Biologist and Forester performed a field exploration of the Project Area in an effort to identify potentially suitable Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*) summer roosting and foraging habitat as defined in the U.S. Fish and Wildlife Service (USFWS) Range-wide Indiana Bat Summer Survey Guidelines, dated April 2016. The *Indiana Bat Habitat Assessment Datasheets* of the Range-wide Guidelines, provided as Appendix A, were completed at 17 locations within the Project Area. These locations pertain to features within the Project Area that would require tree clearing. The locations of these sample sites can be found on the Figure 1. Photos of the 17 sites can be found in Appendix B.

In total, ten specific forest community types were identified within the Project Area, which include one or multiple sample sites. The different forest community types are as follows:

Bat Habitat Sample Sites 1, 2, 3, and 9 comprises of an early successional forest community type, of which cottonwood (*Populus deltoides*) is dominant. The dominant trees are approximately 70' tall and are on average 20" DBH (diameter at breast height). The dominant cottonwoods consist of approximately 10% of the forest community composition. Approximately 60% of this community composition comprises of 60% cottonwood approximately 40' tall with an average DBH of 6". Scattered black willows (*Salix nigra*) approximately 12" average DBH make up the remaining 30% of this community type. These areas contain some suitable foraging habitat for the Indiana bat and northern long-eared bat where there is not a dense understory. Although the dominant cottonwoods have good sun exposure, they are not yet mature to where they would have dead or dying branches, sloughing bark, or cavities. Based on aerial images, these trees established at or after 1998, making them 20 years old at the most. These conditions result in low suitability of roosting habitat for the Indiana bat and northern long-eared bat within these areas. Of this forest community type, approximately 12.37 acres would be impacted.

Bat Habitat Sample Site 4 comprises of an early successional forest community type consisting of boxelder (*Acer negundo*). The boxelders are 2-5" average DBH trees and are approximately 20' tall. The community is densely stemmed with trees spaced approximately 4-6' apart. This area does not contain suitable foraging or roosting habitat for Indiana bats or northern long-eared bats. Of this forest community type, approximately 1.06 acres would be impacted.

Bat Habitat Sample Site 5 comprises of an early successional forest community type consisting of black willows approximately 80-90' tall and an average DBH of 9-10". Some black willow snags existed at a density of approximately 3-4 stems per acre. However, these snags were only approximately 10-20' tall, had little sun exposure, and lacked sloughing bark and cavities. This area does contain suitable foraging habitat for Indiana bat and northern long-eared bat. However, given lack of height within the community's canopy and deficiency of available micro habitats within the limited number of existing snags, suitable roosting habitat for the Indiana bat and northern long-eared bat does not exist within this area. Of this forest community type, approximately 2.80 acres would be impacted.

Bat Habitat Sample Site 6 comprises of an early successional forest community type consisting of a cottonwood overstory and a red mulberry (*Morus rubra*) understory. The scattered cottonwoods are approximately 90' tall with an average DBH of 10-14". The red mulberry understory consisted of trees approximately 15" tall and a high concentration of Japanese hops

(*Humulus japonicus*) growing to heights of 8'. This area does contain suitable foraging habitat for Indiana bat and northern long-eared bat. Although the dominant cottonwoods have good sun exposure, they are not yet mature to where they would have dead or dying branches, sloughing bark, or cavities. Based on aerial images, these trees established at or after 1998, making them 20 years old at the most. These conditions result in low suitability of roosting habitat for the Indiana bat and northern long-eared bat within these areas. Of this forest community type, approximately 8.02 acres would be impacted.

Bat Habitat Sample Sites 7 and 15 comprises of an early successional forest community type consisting of a cottonwood overstory with sycamores (*Platanus occidentalis*) present in the midstroy, and elm (*Ulmus americana*) and hackberry (*Celtis occidentalis*) in the understory. The cottonwoods are approximately 85' tall with an average DBH of 10-14". The sycamores in the midstory appeared to have been outcompeted by the cottonwoods. The elms and hackberries within the understory were 3-8" DBH. Japanese hops existed throughout the understory to heights of approximately 6' tall. This area does contain suitable foraging habitat for Indiana bat and northern long-eared bat. Although the dominant cottonwoods have good sun exposure, they are not yet mature to where they would have dead or dying branches, sloughing bark, or cavities. Based on aerial images, these trees established at or after 1998, making them 20 years old at the most. These conditions result in low suitability of roosting habitat for the Indiana bat and northern long-eared bat within these areas. Of this forest community type, approximately 48.16 acres would be impacted.

Bat Habitat Sample Sites 8, 13, and 14 comprises of an early successional forest community type consisting of a cottonwood overstory approximately 40' tall with an average DBH of 2-5". This dense understory result in low suitability for foraging habitat for Indiana bat and northern long-eared bat with no roosting habitat within these areas. Of this forest community type, approximately 38.78 acres would be impacted.

Bat Habitat Sample Sites 10 and 11 comprise of an early successional forest community type consisting of a scattered cottonwood overstory approximately 65' tall with and average DBH of 20-24". The scattered trees occurred at a density of approximately 3-4 trees per acre. This area does contain suitable foraging habitat for Indiana bat and northern long-eared bat. Although the dominant cottonwoods have good sun exposure, they are not yet mature to where they would have dead or dying branches, sloughing bark, or cavities. Based on aerial images, these trees established at or after 1998, making them 20 years old at the most. These conditions result in low suitability of roosting habitat for the Indiana bat and northern long-eared bat within these areas. Of this forest community type, approximately 20.02 acres would be impacted.

Bat Habitat Sample Site 12 comprises of an early successional forest community type consisting of black willows approximately 30' tall with an average DBH of 3-5". The community is densely stemmed with trees spaced approximately 2-6' apart. This area does not contain suitable foraging or roosting habitat for Indiana bats or northern long-eared bats. Of this forest community type, approximately 8.37 acres would be impacted.

Bat Habitat Sample Site 16 comprises of an early successional forest community type consisting of an overstory of cottonwoods approximately 95' tall with an average DBH of 21-26". The midstory was composed of boxelders approximately 45' tall with an average DBH of 6-9". The understory was largely open. This area does contain suitable foraging habitat for Indiana bat and northern long-eared bat. Although the cottonwoods are dominant, they are not yet mature to where they would have dead or dying branches, sloughing bark, or cavities. Based on aerial images, these trees established at or after 1996, making them 22 years old at the most. These

conditions result in low suitability of roosting habitat for the Indiana bat and northern long-eared bat within these areas. Of this forest community type, approximately 7.05 acres would be impacted.

Bat Habitat Sample Site 17 comprises of an early successional forest community type consisting of silver maples (*Acer saccharinum*) approximately 60' tall with an average DBH of 5-7". This area contains suitable foraging habitat for Indiana bat and northern long-eared bat. Although the dominant silver maples have good sun exposure, they are not yet mature to where they would have dead or dying branches, sloughing bark, or cavities. Based on aerial images, these trees established at or after 1998, making them 20 years old at the most. These conditions result in low suitability of roosting habitat for the Indiana bat and northern long-eared bat within these areas. Of this forest community type, approximately 12.11 acres would be impacted.

All areas/sites occur within close proximity (maximum 1,500 feet) to water, whether it be to the currently ephemeral backwater with shallow water occurring, the ephemeral stream along the landward side of the island, or the perennial flowing Mississippi River.

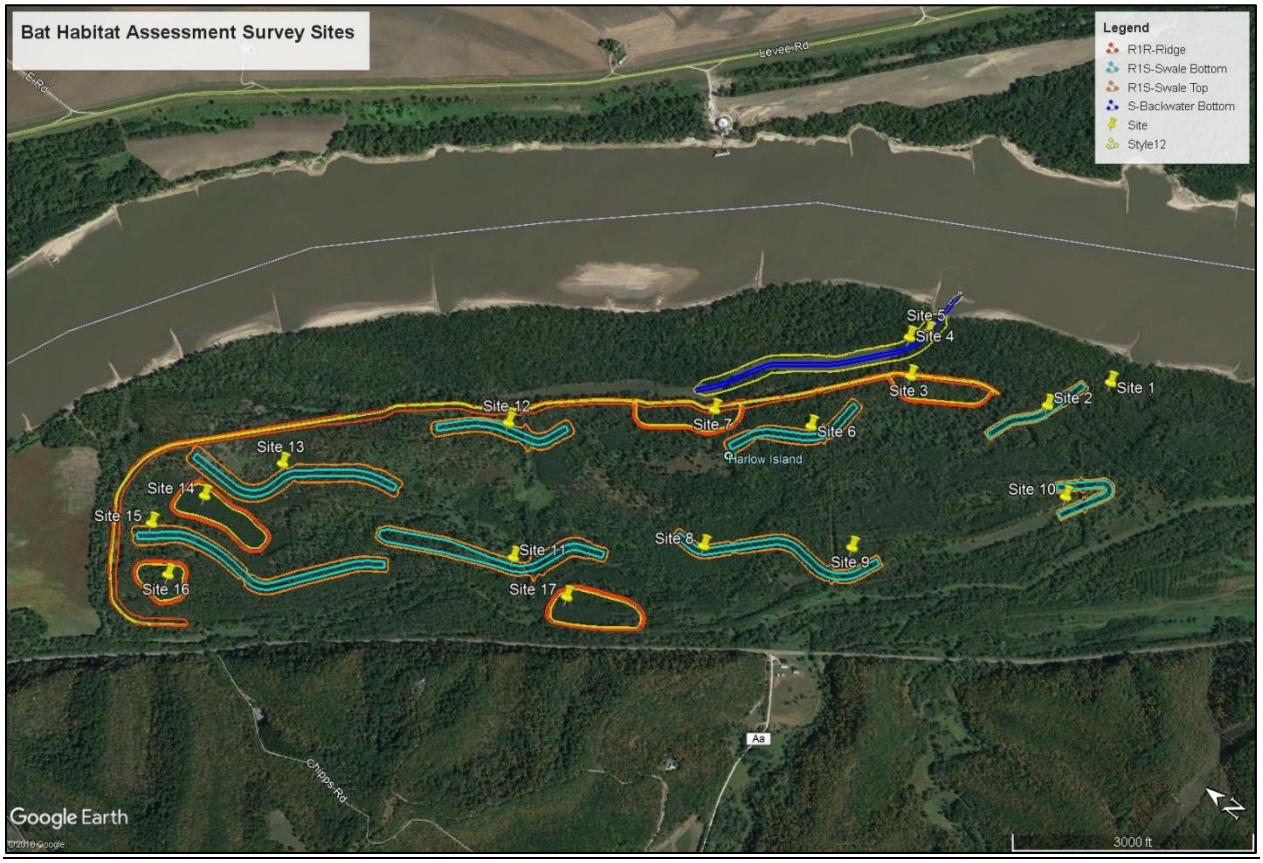

Figure 3. Map Showing Forest Community Types and 17 Sampled Areas

In total, 0 acres of potential suitable roosting habitat and 158.74 acres of potential foraging habitat would be impacted with the excavation of the backwater and swale features and construction of the sediment deflection berm and ridges (Figure 1). However, when using the 2011 National Land Cover Database, this accounts for 1.05% of the total available foraging habitat (15,156 acres) within a 2.5 mile radius and 0.03% of the total available habitat (47,168 acres) within a 5.0 mile radius (Figure 2). Cover types used in this analysis include: deciduous forest, evergreen forest, mixed forest, shrub/scrub, grassland/herbaceous, pasture/hay, woody

wetlands, and emergent wetlands. In addition, although 148.8 acres would be impacted by the excavation of the backwater and swale features and the construction of the sediment deflection berm and the ridges, 70.70 acres of direct forest restoration would occur through tree plantings and 724.9 acres of indirect forest restoration would occur through forest communities developing behind the sediment deflection berm as suitable material is deposited. These forest communities would have a higher composition of hardwood species, which are longer lived, and provide more suitable roosting characteristics than the early successional species currently present throughout the Project Area.

In summary, although there is potential of Indiana bat and northern long-eared bats habitat in isolated locations within the Project Area, the total acreage impacted is small relative to the Project Area itself. In addition the project will be self-mitigating in that the acreages impacted will be exceeded by restored and enhanced habitat. Further, this is a small area relative to the surrounding areas with potential roosting and foraging habitat.

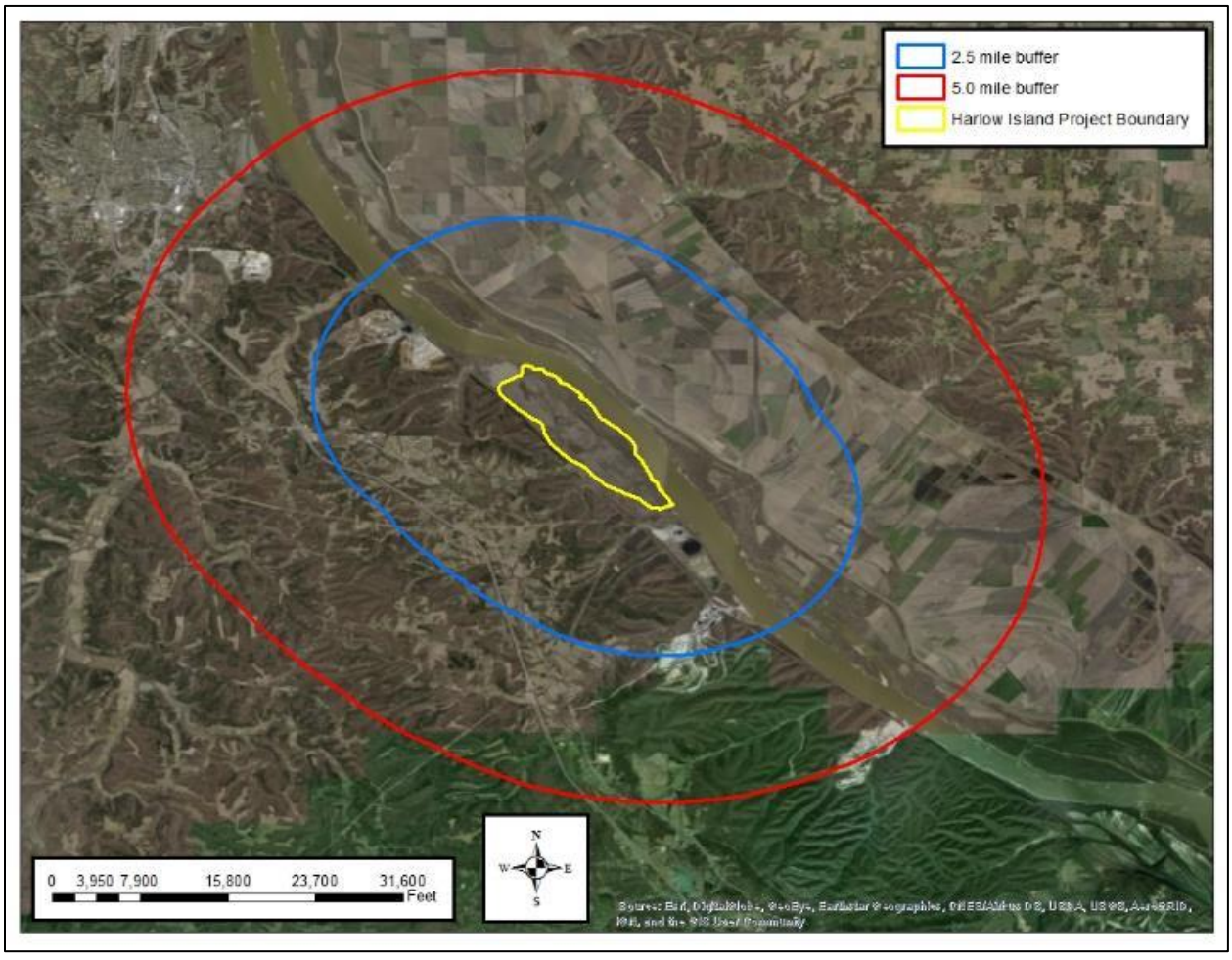

Figure 4. Map of Project Area with 2.5 and 5.0 mile Radius Circles with Potential Offsite Roosting and Foraging Habitat

SUB-APPENDIX A

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APPENDIX A
PHASE I SUMMER HABITAT ASSESSMENTS

Use additional sheets to assess discrete habitat types at multiple sites in a project area
Include a map depicting locations of sample sites if assessing discrete habitats at multiple sites in a project area
A single sheet can be used for multiple sample sites if habitat is the same

Sample Site Description
Sample Site No.(s): 1, 2, 3, 9

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: N/A	Intermittent: N/A	Perennial:	Describe existing condition of water sources: River ≈ 300', adj + [illegible]
Pools/Ponds (# and size)		Open and accessible to bats? N/A		
Wetlands (approx. ac.)	Permanent: N/A	Seasonal: N/A		

Forest Resources at Sample Site				
Closure/Density	Canopy (>50'): 70%	Midstory (20-50'): ~~50~~ 30	Understory (<20'): 30	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	Cottonwood all ~80 ≈ 75' max ~ 75 years old			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in): 60%	Med (9-15 in): 30%	Large (>15 in): 10	
No. of Suitable Snags				

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Possibly foraging in some areas, [illegible]
NOT suitable roosting habitat

Additional Comments:
- Cottonwood dominant - some 70' tall and 20" DBH ≈ 2-5%
→ otherwise smaller 6" DBH - 40' tall
- some willows ≈ 12" (max)

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy, examples of potential suitable snags and live trees, water sources

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Sample Site Description
Sample Site No.(s): 4

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: backwater 2 8 yards away
	N/A	N/A	N/A	
Pools/Ponds (# and size)	backwater	Open and accessible to bats?		
	Yes	Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	Yes			

Forest Resources at Sample Site

Closure/Density	Canopy (> 50')	Midstory (20-50)	Understory (<20)	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
	0	50%	10%	
Dominant Species of Mature Trees	Boxelder 2 7-5" DBH			
% Trees w/ Exfoliating Bark	No	No	No	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	100%	0	0	
No. of Suitable Snags		0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? No

Additional Comments:
Boxelder stand w/ dense understory

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy, examples of potential suitable snags and live trees, water sources

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3-7-18

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Sample Site Description	
Sample Site No.(s):	5

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: Backwater ≥ 200 yds away River ≥ 100 yards away
	NA	NA	NA	
Pools/Ponds (# and size)	Backwater River	Open and accessible to bats?		
		Yes		
Wetlands (approx. ac.)	Permanent	Seasonal		
	Yes			

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
	60%	6	5%	
Dominant Species of Mature Trees	Sal x nigra			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	10%	35%	5%	
No. of Suitable Snags		0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable

IS THE HABITAT SUITABLE FOR INDIANA BATS? Primary NOT Roosting

Additional Comments:
Black willow approx 7-10" average DBH ≥ 80-40' tall about 5/6 yrs old - Small scrub (10-20' tall) snags w/ NO sun exposure - no sloughing Bark

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

3-7-18

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Sample Site Description	
Sample Site No.(s): 6	

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: NA	Intermittent: NA	Perennial: NA	Describe existing condition of water sources: Both banks ≥ 100 yards away
Pools/Ponds (# and size)	No	Open and accessible to bats? No		
Wetlands (approx. ac.)	Permanent: Ditch	Seasonal: Yes		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
	10%	30%	20%	
Dominant Species of Mature Trees	Cottonwood canopy, Red mulberry understory			
% Trees w/ Exfoliating Bark	0%	0%	0%	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	40%	60%		
No. of Suitable Snags		0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Forested/ Not Roosting

Additional Comments:
- Scattered cottonwood ≥ 90' tall 10-14" DBH max
- Red mulberry understory ≥ 15' tall
- One pecan ≥ 6" DBH 25' tall

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy, examples of potential suitable snags and live trees, water sources

3-7-18
3-8-18

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Sample Site Description	
Sample Site No.(s).	7, 15

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: 2 rivers, stream backwater
	NA	NA	NA	
Pools/Ponds (# and size)	N/A	Open and accessible to bats?		
		N/A		
Wetlands (approx. ac.)	Permanent	Seasonal		
	15			

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
	60%	20%	10%	
Dominant Species of Mature Trees	Cottonwood			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	15%	80%	5%	
No. of Suitable Snags		0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? Foraging / Roosting

Additional Comments:
- Cottonwood dominant @ 85' tall, DBH 10-14"
- some sycamore in midstory → outcompeted by cottonwood
- Elm & Hackberry in understory

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees, water sources

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APPENDIX A
PHASE 1 SUMMER HABITAT ASSESSMENTS

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Sample Site Description
Sample Site No.(s): ~~8,~~ ~~12~~, 13, 14

Water Resources at Sample Site

Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources:
	NA	NA	NA	Cottonwood 100 yards SW
Pools/Ponds (# and size)	No	Open and accessible to bats?		
Wetlands (approx. ac.)	Permanent	Seasonal		

Forest Resources at Sample Site

Closure/Density	Canopy (> 50')	Midstory (20-50')	Understory (<20')
	0	50%	<10%

1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%

Dominant Species of Mature Trees	Cottonwood		
% Trees w/ Exfoliating Bark			
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)
	100	0	0
No. of Suitable Snags	0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable.

IS THE HABITAT SUITABLE FOR INDIANA BATS? NOT Foraging, NOT Roosting

Additional Comments:
Cottonwood ≥ 40' tall, 2-5" DBH
- dense understory
→ probably less than 10 years old

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees, water sources

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3-8-18

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Sample Site Description	
Sample Site No.(s):	10, 11

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: Stream approx 150 yards away
	NA	NA	NA	
Pools/Ponds (# and size)	No	Open and accessible to bats?		
		N/A		
Wetlands (approx. ac.)	Permanent	Seasonal		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 30')	Midstory (20-30')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
	@ 1%	0	0	
Dominant Species of Mature Trees	Cottonwood → scattered			
% Trees w/ Exfoliating Bark	No	No	No	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	0	0	100%	
No. of Suitable Snags		0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable

IS THE HABITAT SUITABLE FOR INDIANA BATS? Foraging NOT Roost

Additional Comments:
Cottonwood ~ 65' tall, 10-24" DBH ~ 3-4 trees/acre - No cavities or sloughing bark - trees are ~ 25 years

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy; examples of potential suitable snags and live trees; water sources

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Sample Site Description
Sample Site No.(s): TL1

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: River and backwater ~+250 yards away
	NA	NA	NA	
Pools/Ponds (# and size)	No	Open and accessible to bats?		
		No		
Wetlands (approx. ac.)	Permanent	Seasonal		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
	0%	~60%	10%	
Dominant Species of Mature Trees	Salix nigra			
% Trees w/ Exfoliating Bark	0%	0%	0%	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	95%	5%	0	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable

IS THE HABITAT SUITABLE FOR INDIANA BATS? NOT Foraging
NOT Roosting

Additional Comments:
Black willow ~ 3-5" DBH, ~ 30' tall
- dense understory

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy, examples of potential suitable snags and live trees, water sources

3-8-18

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Sample Site Description
Sample Site No.(s): 16

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral: NA	Intermittent: NA	Perennial: NA	Describe existing condition of water sources: River [illegible]
Pools/Ponds (# and size)	NA	Open and accessible to bats? NA		
Wetlands (approx. ac.)	Permanent:	Seasonal:		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50') 70%	Midstory (20-50') 20	Understory (<20') 10	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
Dominant Species of Mature Trees	Cottonwood			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in) 5	Med (9-15 in) 60	Large (>15 in) 35%	
No. of Suitable Snags	0			

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable

IS THE HABITAT SUITABLE FOR INDIANA BATS? Foraging
NOT Roosting

Additional Comments:
- Cottonwood ≈95' tall, 21-26" DBH, 50 years old?
- Boxelder [illegible] midstory, ≈45' tall, ≈6-9" DBH average
- Open understory

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy, examples of potential suitable snags and live trees, water sources

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3-8-18

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Sample Site Description	
Sample Site No.(s): 17	

Water Resources at Sample Site				
Stream Type (# and length)	Ephemeral	Intermittent	Perennial	Describe existing condition of water sources: Stream approx 100 yards away ephemeral
	NA	NA	NA	
Pools/Ponds (# and size)		Open and accessible to bats?		
Wetlands (approx. ac.)	Permanent	Seasonal		

Forest Resources at Sample Site				
Closure/Density	Canopy (> 50')	Midstory (20-50')	Understory (<20')	1=1-10%, 2=11-20%, 3=21-40%, 4=41-60%, 5=61-80%, 6=81-100%
	80%	20%	10%	
Dominant Species of Mature Trees	Silver Maple			
% Trees w/ Exfoliating Bark	0	0	0	
Size Composition of Live Trees (%)	Small (3-8 in)	Med (9-15 in)	Large (>15 in)	
	95%	5%	0	
No. of Suitable Snags		0		

Standing dead trees with exfoliating bark, cracks, crevices, or hollows. Snags without these characteristics are not considered suitable

IS THE HABITAT SUITABLE FOR INDIANA BATS? Foraging
NOT Roosting

Additional Comments:
- Silver maple s, 60' tall, 5-7" average DBH
- dense stem density

Attach aerial photo of project site with all forested areas labeled and a general description of the habitat

Photographic Documentation: habitat shots at edge and interior from multiple locations; understory/midstory/canopy, examples of potential suitable snags and live trees, water sources

SUB-APPENDIX B

Site 1

Site 2

Site 3

Site 4

Site 5

Site 6

Site 7

Site 8

Site 9

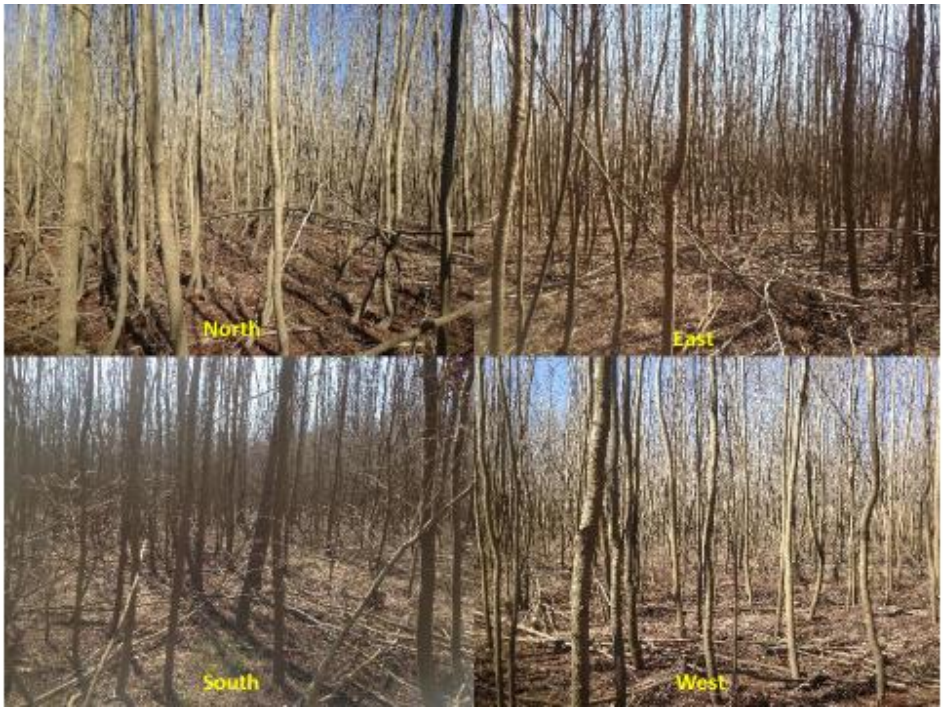
Site 10

Site 11

Site 12

Site 13

Site 14



Site 15

Site 16

Missing Photos

SITE 17

SUB-APPENDIX C - NLEB 4(D) RULE STREAMLINED CONSULTATION FORM

Northern Long-Eared Bat 4(d) Rule Streamlined Consultation Form

Federal agencies should use this form for the optional streamlined consultation framework for the northern long-eared bat (NLEB). This framework allows federal agencies to rely upon the U.S. Fish and Wildlife Service's (USFWS) January 5, 2016, intra-Service Programmatic Biological Opinion (BO) on the final 4(d) rule for the NLEB for section 7(a)(2) compliance by: (1) notifying the USFWS that an action agency will use the streamlined framework; (2) describing the project with sufficient detail to support the required determination; and (3) enabling the USFWS to track effects and determine if reinitiation of consultation is required per 50 CFR 402.16.

This form is not necessary if an agency determines that a proposed action will have no effect to the NLEB or if the USFWS has concurred in writing with an agency's determination that a proposed action may affect, but is not likely to adversely affect the NLEB (i.e., the standard informal consultation process). Actions that may cause prohibited incidental take require separate formal consultation. Providing this information does not address section 7(a)(2) compliance for any other listed species.

Information to Determine 4(d) Rule Compliance:	**YES**	**NO**
1. Does the project occur wholly outside of the WNS Zone[1]?	☐	☒
2. Have you contacted the appropriate agency[2] to determine if your project is near known hibernacula or maternity roost trees?	☒	☐
3. Could the project disturb hibernating NLEBs in a known hibernaculum?	☐	☒
4. Could the project alter the entrance or interior environment of a known hibernaculum?	☐	☒
5. Does the project remove any trees within 0.25 miles of a known hibernaculum at any time of year?	☐	☒
6. Would the project cut or destroy known occupied maternity roost trees, or any other trees within a 150-foot radius from the maternity roost tree from June 1 through July 31.	☐	☒

You are eligible to use this form if you have answered yes to question #1 **or** yes to question #2 **and** no to questions 3, 4, 5 and 6. The remainder of the form will be used by the USFWS to track our assumptions in the BO.

Agency and Applicant[3] U.S. Army Corps of Engineers

Benjamin McGuire, Benjamin.M.McGuire@usace.army.mil, 314-331-8478.

Project Name: Harlow Island HREP

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[1] http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf

[2] See http://www.fws.gov/midwest/endangered/mammals/nleb/nhisites.html

[3] If applicable - only needed for federal actions with applicants (e.g., for a permit, etc.) who are party to the consultation.

Project Location: Located on the right descending bank of the Mississippi River in Jefferson County, Missouri. The project is between river miles 140.0 and 144.5.

Basic Project Description (provide narrative below or attach additional information):
The St. Louis District of the U.S. Army Corps of Engineers is proposing to implement restoration measures including the excavation of a backwater, construction of a sediment deflection berm, construction of elevated ridges for hard mast tree species, excavation of swale wetlands, and reforestation of hard mast tree species on the sediment deflection berm and the ridges. The Harlow Island Biological Assessment details of the project are listed in the biological assessment in Section 2.2.

General Project Information	**YES**	**NO**
Does the project occur within 0.25 miles of a known hibernaculum?	☐	☒
Does the project occur within 150 feet of a known maternity roost tree?	☐	☒
Does the project include forest conversion[4]? (if yes, report acreage below)	☐	☒
Estimated total acres of forest conversion		
If known, estimated acres[5] of forest conversion from April 1 to October 31		
If known, estimated acres of forest conversion from June 1 to July 31[6]		
Does the project include timber harvest? (if yes, report acreage below)	☒	☐
Estimated total acres of timber harvest (manipulation)	158.7	
If known, estimated acres of timber harvest from April 1 to October 31	0	
If known, estimated acres of timber harvest from June 1 to July 31	0	
Does the project include prescribed fire? (if yes, report acreage below)	☐	☒
Estimated total acres of prescribed fire	0	
If known, estimated acres of prescribed fire from April 1 to October 31	0	
If known, estimated acres of prescribed fire from June 1 to July 31	0	
Does the project install new wind turbines? (if yes, report capacity in MW below)	☐	☒
Estimated wind capacity (MW)		

Agency Determination:

By signing this form, the action agency determines that this project may affect the NLEB, but that any resulting incidental take of the NLEB is not prohibited by the final 4(d) rule.

[4] Any activity that temporarily or permanently removes suitable forested habitat, including, but not limited to, tree removal from development, energy production and transmission, mining, agriculture, etc. (see page 48 of the BO).

[5] If the project removes less than 10 trees and the acreage is unknown, report the acreage as less than 0.1 acre.

[6] If the activity includes tree clearing in June and July, also include those acreage in April to October.

If the USFWS does not respond within 30 days from submittal of this form, the action agency may presume that its determination is informed by the best available information and that its project responsibilities under 7(a)(2) with respect to the NLEB are fulfilled through the USFWS January 5, 2016, Programmatic BO. The action agency will update this determination annually for multi-year activities.

The action agency understands that the USFWS presumes that all activities are implemented as described herein. The action agency will promptly report any departures from the described activities to the appropriate USFWS Field Office. The action agency will provide the appropriate USFWS Field Office with the results of any surveys conducted for the NLEB. Involved parties will promptly notify the appropriate USFWS Field Office upon finding a dead, injured, or sick NLEB.

Signature: _____ Date Submitted: _____

8 CORRESPONDENCE LETTER FROM USACE TO USFWS

9 RESPONSE LETTER FROM USFWS TO USACE

10 USFWS IPAC REPORT

United States Department of the Interior

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

In Reply Refer To:
Consultation Code: 03E14000-2018-SLI-0724
Event Code: 03E14000-2018-E-03473
Project Name: Harlow Island HREP

May 11, 2018

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

To Whom It May Concern:

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

Threatened and Endangered Species

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

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

Consultation Technical Assistance

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

Federally Listed Bat Species

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

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

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

Examples of unsuitable habitat include:

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

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

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

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

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

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

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

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

Other Trust Resources and Activities

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

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

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

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

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

Next Steps

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

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

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

Karen Herrington

Attachment(s):

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

Official Species List

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

This species list is provided by:

Missouri Ecological Services Field Office
101 Park Deville Drive
Suite A
Columbia, MO 65203-0057
(573) 234-2132

Project Summary

Consultation Code: 03E14000-2018-SLI-0724

Event Code: 03E14000-2018-E-03473

Project Name: Harlow Island HREP

Project Type: ** OTHER **

Project Description: Jefferson County, MO, River mile 140.5-144.0. Project features include backwater dredging, wetland enhancement, construction of a sediment deflection berm, and the constructed of elevated ridges for hardmast tree plantings.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.155641424181056N90.28723651601221W

Counties: Jefferson, MO

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

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

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

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

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

Mammals

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

Fishes

NAME	STATUS
Pallid Sturgeon *Scaphirhynchus albus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7162	Endangered

Critical habitats

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

USFWS National Wildlife Refuge Lands And Fish Hatcheries

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

REFUGE INFORMATION WAS NOT AVAILABLE WHEN THIS SPECIES LIST WAS GENERATED. PLEASE CONTACT THE FIELD OFFICE FOR FURTHER INFORMATION.

Wetlands

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

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

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

FRESHWATER EMERGENT WETLAND

- PEMC
- PEMKh

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1A
- PFO1C
- PSS1C

RIVERINE

- R2UBH