DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
ROBERT A. YOUNG BUILDING - 1222 SPRUCE ST.
ST. LOUIS, MISSOURI 63103-2833

26 November 2014

Reply to:
Regional Planning and Environmental Division North
Environmental Compliance Section (PD-C)

Dear Sir or Madam:

The St. Louis District of the U.S. Army Corps of Engineers has developed an Interim Risk Reduction Measure (IRRM) to address a severe scour issue associated with the Lock and Dam 25 Overflow Dike. The District considers the Lock and Dam 25 Overflow Dike to be under an imminent threat of failure due to uncontrolled underseepage. The District has determined that such a failure would result in severe economic losses, and that this threat will continue to exist until risk reduction measures are in place.

The IRRM involves dredging sand into the scour hole (via suction dredge or other mechanical means), reestablishing the river bankline with stone revetment, and armoring the surface of the newly placed dredge material with a layer of bedding stone and topped with larger stone.

The District has prepared an Environmental Assessment (EA) with Draft Finding of No Significant Impact (FONSI) for the emergency work. This document serves to notify the public of the project and analyze the probable environmental impacts of the alternatives. You are receiving this letter because you may be interested in the project. The EA with FONSI are available for public review. The electronic version of these documents is available online at http://www.mvs.usace.army.mil/Portals/54/docs/pm/Reports/EA/L&D 25 Spillway Scour Repair Draft EA and Unsigned FONSI 2014 Combined Documents.pdf, or you may request a copy of the EA and FONSI be mailed to you. The FONSI summarizes the anticipated effects of the project on the environment, and is unsigned. The FONSI will be signed into effect only after comments received as a result of this public review have been carefully considered.

Environmental impacts are anticipated to be minimal, and will consist of temporary short term impacts to noise levels, and increases turbidity and air quality in the immediate vicinity of the project. Approximately 5.3 acres of open water will be filled in by sand and/or stone and tied into the adjacent bankline.

Engineering Regulation 200-2-2, Environmental Quality, Procedures for Implementing the National Environmental Policy Act (NEPA) provides for District commanders to respond to emergency situations to prevent or reduce imminent risk of life, health, property, or severe

economic losses without first preparing specific documentation and following the procedural requirements of the NEPA.

Due to the emergency nature of the project, NEPA documentation will be completed after the initiation of the Interim Risk Reduction Measure. Coordination with federal and state natural resource agencies has already begun.

Please provide any comments you may have regarding this project. For questions, comments, or to request a printed copy, please contact: Dr. Teri Allen of the Environmental Compliance Section, **telephone** 314-331-8084, **facsimile number** (314) 331-8606, or **e-mail** at Teri.C.Allen@usace.army.mil. Written comments may be sent to the address below, ATTN: Environmental and Planning Branch (PD-C, Allen). Please respond by noon on Monday, 29 December 2014.

Address:
U.S. Army Corps of Engineers, St. Louis District
Regional Planning and Environmental Division North
Environmental Compliance Section (CEMVP-PD-C)
1222 Spruce Street
St. Louis, Missouri 63103-2833

Sincerely,

TC Allen for

Timothy K. George
Supervisory Ecologist
Environmental Compliance Section

Enclosure

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

CEMVS-DE

NOV 25 2014

MEMORANDUM FOR RECORD

SUBJECT: Imminent Threat of Failure of Lock and Dam 25 Overflow Dike resulting in Loss of Pool

1. A scour hole at the toe of the overflow dike for Lock and Dam 25 was hydrographically surveyed on October 22, 2014. Survey information was received November 6, 2014 at which time it was discovered that the scour was approximately 20 feet deep to an elevation of approximately 405. This elevation represents scour extending by as much as 10 feet below the bottom of the sheetpile cutoff wall which is at elevation 414. The potential failure of the overflow dike could occur through uncontrolled underseepage given that a direct connection now exists between the pool side and tail. Also of concern during a high water event is a failure due to overtopping of the overflow dike. The St. Louis District has obtained Mississippi Valley Division (MVD) Dam and Levee Safety Production Center and RMC concurrence and each group believes this is an emergency situation that may not survive the next high water event, which would lead to a loss of pool.

2. In coordination with the MVD Dam Safety Production Center and the RMC DSMS team, the District has developed an Interim Risk Reduction Measure (IRRM) to address the scour issue. The developed plan includes dredging sand to fill the scour hole, reestablishing a bankline with revetment, and armoring the newly placed sand. A preferential flow path will be established in the armor stone to prevent flanking of the repair. Bank revetment will extend beyond the limits of the scour hole to also prevent flanking of the repair. This initial plan has been reviewed by the RMC Dam Safety cadre. The plan has also been shared with the MVD Dam Safety Production Center the Inland Navigation Design Center.

3. Engineering Regulation 200-2-2, Environmental Quality, Procedures for Implementing the National Environmental Policy Act (NEPA) provides for District commanders to respond to emergency situations to prevent or reduce imminent risk of life, health, property, or severe economic losses without first preparing specific documentation and following the procedural requirements of the NEPA. Imminent risk is defined as a subjective, statistically supported evaluation of how quickly a threat scenario can develop, how likely that the threat is to develop, and how likely it is that the threat will produce catastrophic consequences. Implicit in the timing aspect can be considerations of time or season or of known cyclical activities.

4. NEPA documentation prepared in support of the IRRM will consist of an Environmental Assessment and draft Finding of No Significant Impact to be circulated in late November for a 30-day public and agency review. To elicit any comments or concerns with the plan of action, coordination with federal and state natural resource agencies has already begun, including the identification of any permitting requirements. It is likely that such documentation would be accomplished after the initiation of emergency work.

5. Based upon applicable regulations and guidance, I consider the Lock and Dam 25 Overflow Dike to be under an imminent threat of failure due to uncontrolled underseepage. I have determined that such a failure would result in severe economic losses. I also find that this threat will continue to exist until risk reduction measures are in place. The District will continue preparing an environmental assessment of the impacts associated with the interim risk reduction measures, and release the document for public and agency review and comment as soon as possible after all features of the restoration work are determined.

In compliance with ER 200-2-2, Paragraph 8.

ANTHONY P. MITCHELL
COL, EN
Commanding

DRAFT ENVIRONMENTAL ASSESSMENT
WITH
UNSIGNED FINDING OF NO SIGNIFICANT IMPACT

Lock and Dam 25 Overflow Dike Scour
Interim Risk Reduction Measure
Mississippi River, Mile 241.5
Calhoun County, Illinois
Lincoln County, Missouri

U.S. Army Corps of Engineers, St. Louis District
Environmental Branch (CEMVS-PD-E)
1222 Spruce Street
St. Louis, Missouri 63103-2833
Telephone Number: (314) 331-8084

November 2014

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DRAFT ENVIRONMENTAL ASSESSMENT

Lock and Dam 25 Overflow Dike Scour
Interim Risk Reduction Measure
Mississippi River, Mile 241.5
Calhoun County, Illinois
Lincoln County, Missouri

1. INTRODUCTION

The U.S. Army Corps of Engineers (USACE), Mississippi Valley Division (MVD), St. Louis District (CEMVS), has prepared this Environmental Assessment (EA) to evaluate the potential impacts associated with the proposed Lock and Dam 25 overflow dike scour Interim Risk Reduction Measure (IRRM) project.

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.

Impacts on environmental resources are discussed in detail in the Draft Environmental Assessment and summarized in the Unsigned Finding of No Significant Impact (FONSI).

1.1. PROJECT LOCATION

Lock and Dam 25 (L&D 25) is located on the Mississippi River, approximately 3 miles east of Winfield, Missouri, along the east shore of Bradley Island, 61.5 river miles upstream from St. Louis, Missouri, and 241.5 river miles above the mouth of the Ohio River. Pool 25 extends from L&D 25 upstream 32 river miles to Lock and Dam 24 at Clarksville, Missouri. L&D 25 was designed and constructed to operate in conjunction with similar structures upstream and downstream to provide continuous navigation on the upper Mississippi River. The lock is located in Lincoln County, Missouri, with the dam extending across the state line to Illinois. The overflow project area is located in Calhoun County, Illinois. (Figures 1-2).

1.2. PROJECT DESCRIPTION

Lock and Dam 25 consists of a main lock and an upper gate bay for an auxiliary lock; upstream and downstream guidewalls; a dam consisting of 14 tainter gates and three roller gates; a storage yard at the end of the dam section (Illinois side) for storage of emergency bulkheads, heavy equipment parts, etc.; a fixed submersible stone-covered earth overflow dike reaching from the storage yard to the Illinois bluffs; an earth dike (Sandy Slough dike) extending from the end of the upper guidewall to the Kings Lake Levee (approximately 5 miles); and an access road

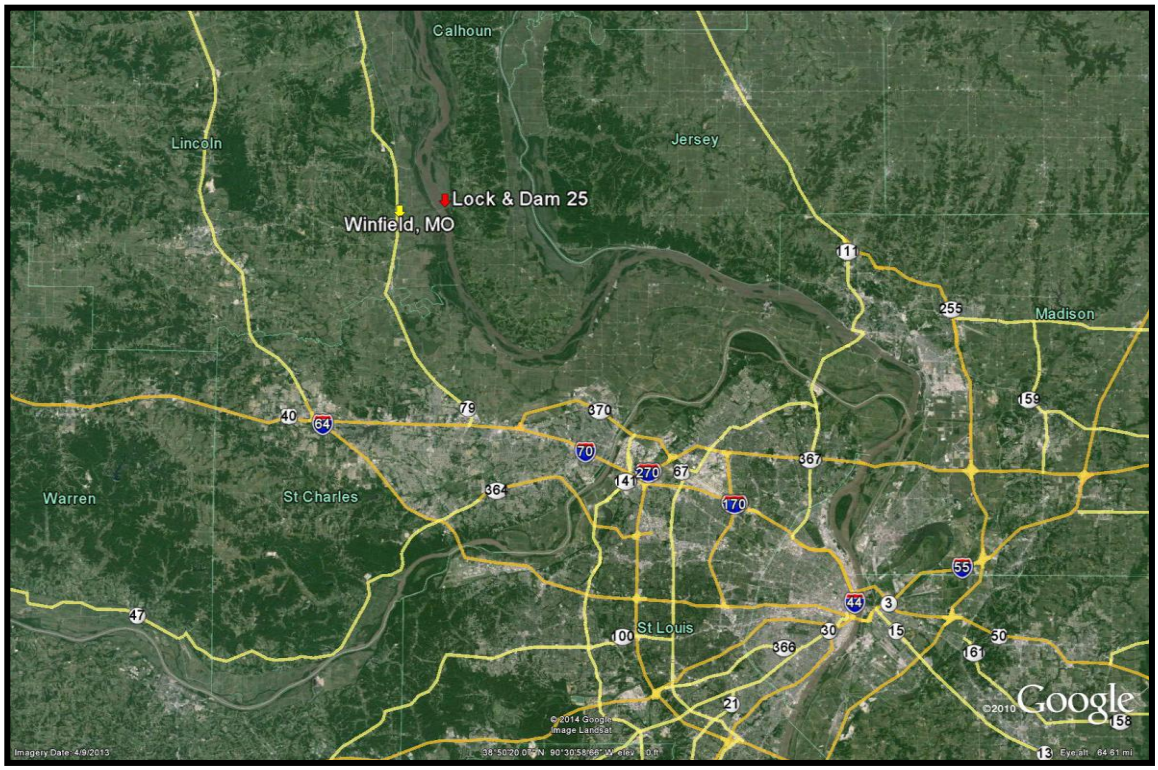

Figure 1. Lock & Dam 25 vicinity; Lincoln County, Missouri, and Calhoun County, Illinois.

Figure 2. Project Location, Lock & Dam 25 overflow dike, Calhoun County, Illinois.

and bridge over Sandy Slough which connects the project to the Missouri shore. Maximum regulated pool is elevation 434.0 feet NGVD.

The overflow dike extends from the dam storage yard on the Illinois side of the dam to the Illinois bluffs. The overflow dike is constructed of compacted earth fill with a crest width of 20 feet and 1V on 3H upstream and 1V on 4H downstream side slopes. Side slopes are protected by an 18-inch layer of hand-placed stone on 6-inch gravel bedding. Twenty-foot lengths of steel sheet piling were installed in a semi-elliptical cellular configuration to provide seepage control. Individual cells were constructed with a top of the sheet piles at Elevation 434.0 and are 31 feet across the long axis taken parallel to the centerline of the dike and 20 feet across the short axis in the upstream-downstream direction. The common connecting diaphragm wall between cells (a distance of approximately 10 feet) is made up of 15-foot long sheets. A 20-foot wide concrete paving (4 to 6-inches thick) was added to the top of the overflow in 1988 to provide limited vehicular access and a wearing surface against erosion. The overflow dike ranges in height from approximately 3 to 22 feet. Access to the overflow dike is limited. Water access is not deemed practical from the upstream side due to the silting upstream of the overflow dike; however, water access from the downstream side near the storage yard is possible.

1.3. Proposed Project Action and Need

A scour hole at the toe of the L&D 25 overflow dike was hydrographically surveyed on 22 October 22 2014. Survey information was received on 6 November 2014, at which time it was discovered that the scour was approximately 20 feet deep, extending by as much as 10 feet below the bottom of the sheetpile cutoff wall (Figure 3). The potential failure of the overflow dike could occur through uncontrolled underseepage given that a direct connection now exists between the pool side and tail. Also of concern during a high water event is a failure due to overtopping of the overflow dike.

The purpose of the proposed project is to protect the overflow dike portion of the dam from further erosion. This action is needed to: prevent a failure of the dike, loss of pool 25, interruption in navigation operations on the Upper Mississippi River (UMR), and severe economic losses to the region and the nation.

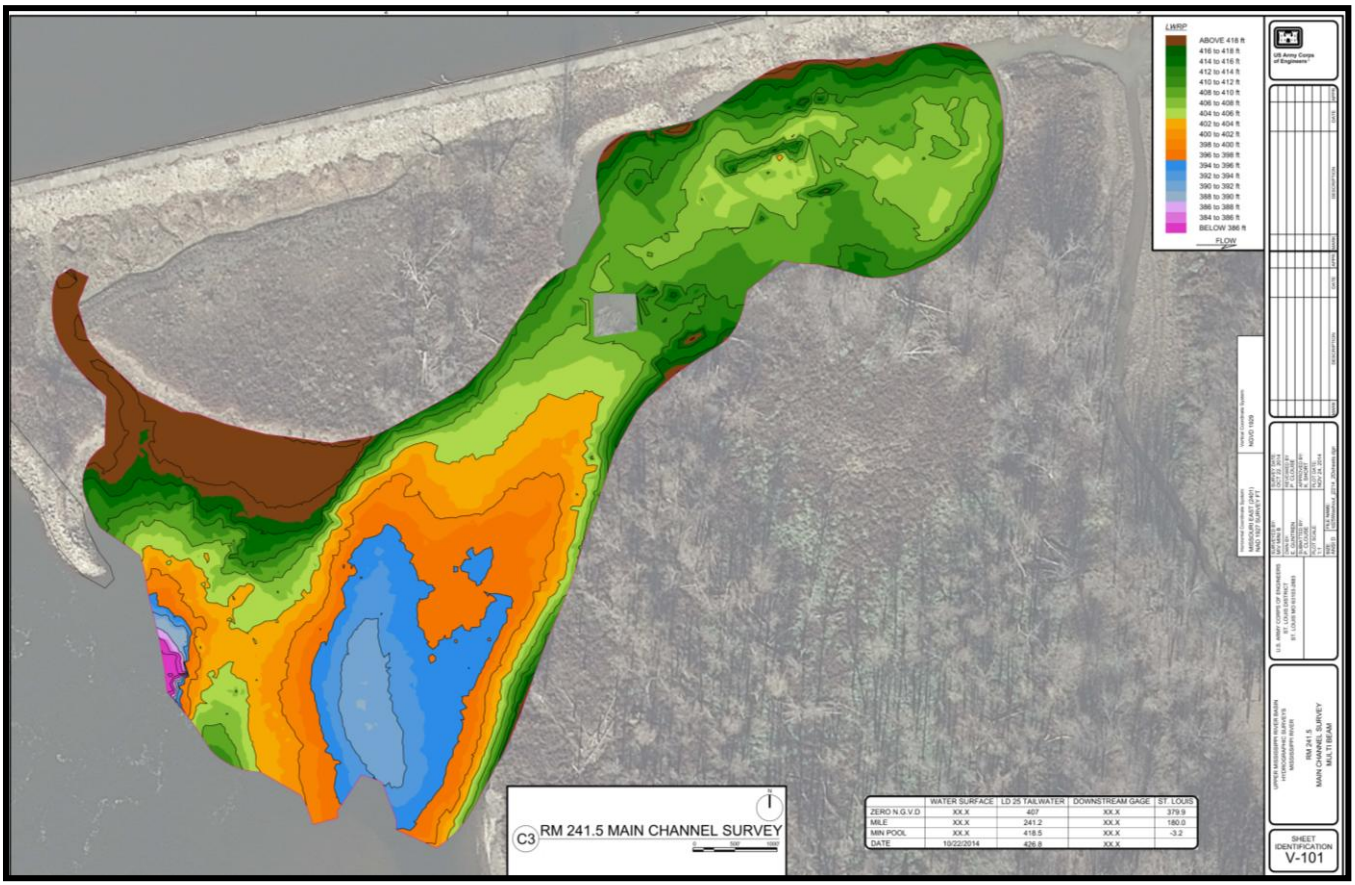

Figure 3. Hydrographic survey of the L&D 25 overflow dike scour area, Calhoun County, Illinois.

1.4. Project Authorization

Lock and Dam No. 25 was authorized by the Rivers and Harbors Act of 1935, House Document No. 137, 72nd Congress, First Session. The lock and dam is part of the navigation project to provide a 9-foot deep by 400-foot minimum width channel on the upper Mississippi River between the mouth of the Missouri River and Minneapolis, Minnesota that was authorized by the Rivers and Harbors Act, 3 July 1930, Rivers and Harbors Commission Document No. 12, 70th Congress, First Session. Local cooperation was not required. The project became operational on 18 May 1939.

2. ALTERNATIVES CONSIDERED

2.1. Alternative 1 - No Action (Future without Project)

Under the "No Action Alternative", no federal action would be taken to repair existing scouring and erosion occurring at the L&D 25 overflow dike area. The overflow dike would eventually fail resulting in loss of pool and loss of navigation capability. Accordingly, further evaluation of

the “No Action Alternative” is not provided in this Environmental Assessment, since it does not meet the purpose of the proposed project.

2.2. Alternative 2 - Repair The Overflow Dike Scour Area

The L&D 25 overflow dike area is described in section 1.2. Under this alternative, the scour downstream of the overflow dike would be addressed by filling the area with dredged sand, reestablishing the bankline, and armoring the newly placed dredge material. A preferential flow path would be established on the armored surface to prevent future scour and flanking of this IRRM.

2.3 Proposed Action

The tentatively selected plan to address the overflow dike scour is Alternative 2 – Repair the Overflow Dike Scour Area (Figure 4).

The IRRM involves dredging sand into the scour hole (via suction dredge or other mechanical means), reestablishing the river bankline with stone revetment, and armoring the surface of the newly placed dredge material. The surface of the riprap will form a shallow channel to provide a preferential path for water to flow back into the main river channel during overtopping events. Approximately 110,000 cubic yards of sand and gravel material will be dredged into the scour hole. A 48 inch layer of Graded Stone A will be placed across the newly established dredge material bankline, extending upstream and downstream to prevent flanking of the revetment. A 9 inch layer of bedding stone will be placed across the top surface of the newly placed dredge material, totaling 10,000 tons of stone. Thirty-six inches of 1,000 pound riprap will be placed over the bedding on the northern portion of the riprap channel within approximately 185 feet of the overflow dike centerline. Twenty-eight inches of 650 pound riprap will be placed over the bedding on the remainder of the riprap channel. The edges of this stone will tie into the existing ground on all edges of the scour hole.

All stone will be delivered by barge and bankline stone will be placed by barge. Bedding and surface protection stone may be stockpiled to the north-northwest of the scour hole before the sand is dredged. Land based equipment will be used to place the bedding and surface protection stone.

Dredging is anticipated to occur in the main river channel adjacent to the scour area, and is not permitted near any known mussel beds. The construction activity is expected to start as soon as the dredge and/or other equipment arrives onsite. The construction duration is approximately 60 days.

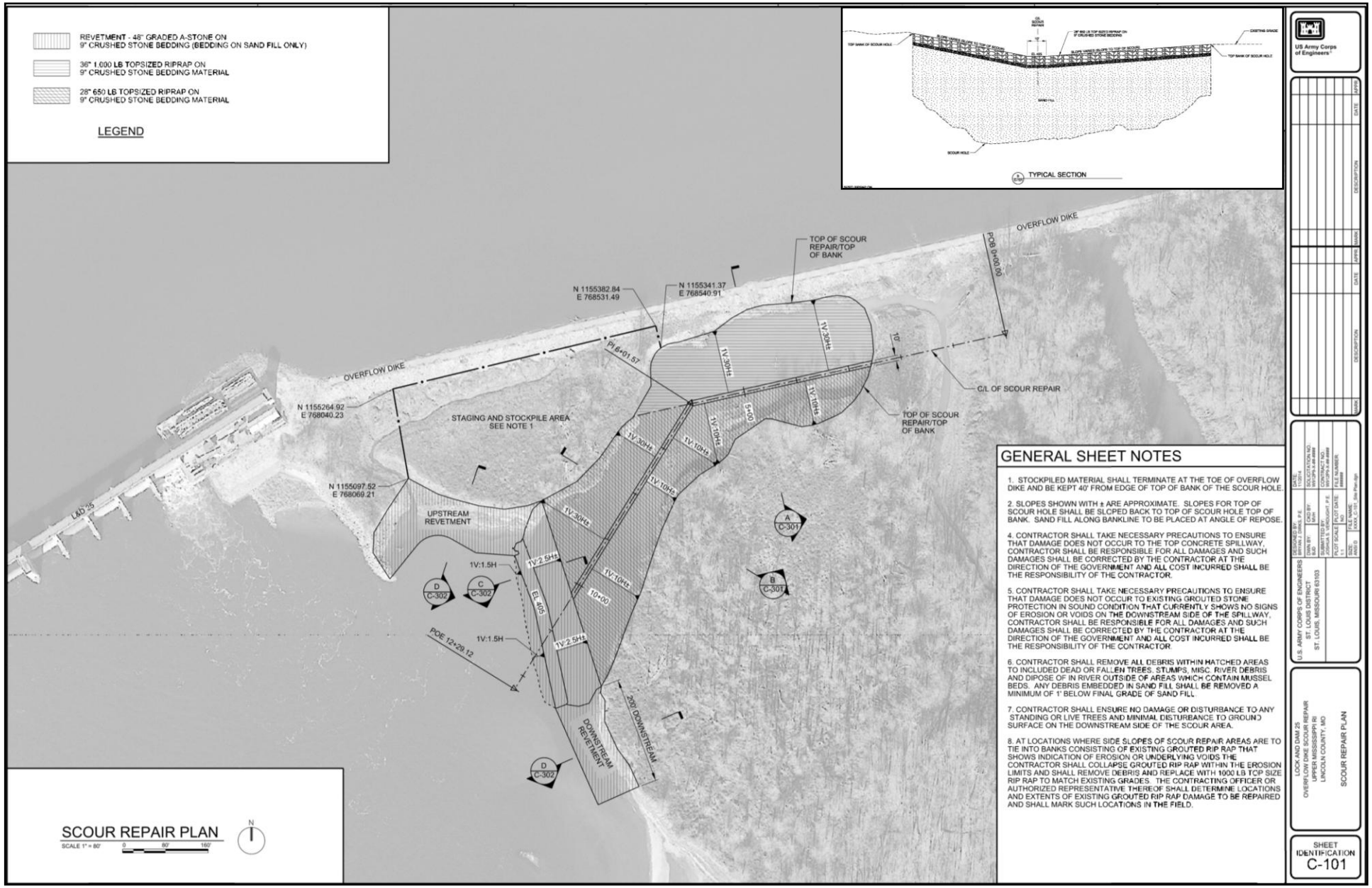

Figure 4. Preliminary drawing of the L&D 25 overflow dike scour IRRM plan, located in Calhoun County, Illinois.

3. DESCRIPTION OF EXISTING ENVIRONMENT

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

3.1. PHYSICAL SETTING

The physical setting for the proposed project is the river and adjacent left descending bank area immediately downstream of the L&D 25 overflow dike, MRM 241.5. Normal pool at L&D 25 is at elevation 434 feet. Pool 25 is regulated by Environmental Pool Management (EPM) guidelines which mean water levels range between 429.7 – 434.0 ft NGVD at Lock and Dam 25. EPM stabilizes water levels and promotes vegetative growth while maintaining the required navigation depth.

3.2. AESTHETICS

Aesthetic resources include the Mississippi River, which is located adjacent to the study area, and undeveloped open spaces, which are mainly agricultural lands with small areas of forested habitat.

3.3. AIR QUALITY

Six criteria pollutants are addressed in the U.S. Environmental Protection Agency's (USEPA) National Ambient Air Quality Standards (NAAQS). These include particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide, ozone, carbon monoxide, lead, and nitrogen dioxide. Lincoln County, Missouri, and Calhoun County, Illinois are in attainment for all pollutants.

3.4. NOISE

Transportation-related noise, such as that created by navigation traffic, railroads, planes, and small highways, is the main source of noise within the study area. Additional noise can be attributed to gun shots that occur during hunting season. Agricultural and open space areas typically have noise levels in the range of 34-70 decibels (dB; a measure of loudness) depending on their proximity to transportation arteries (Figure 5).

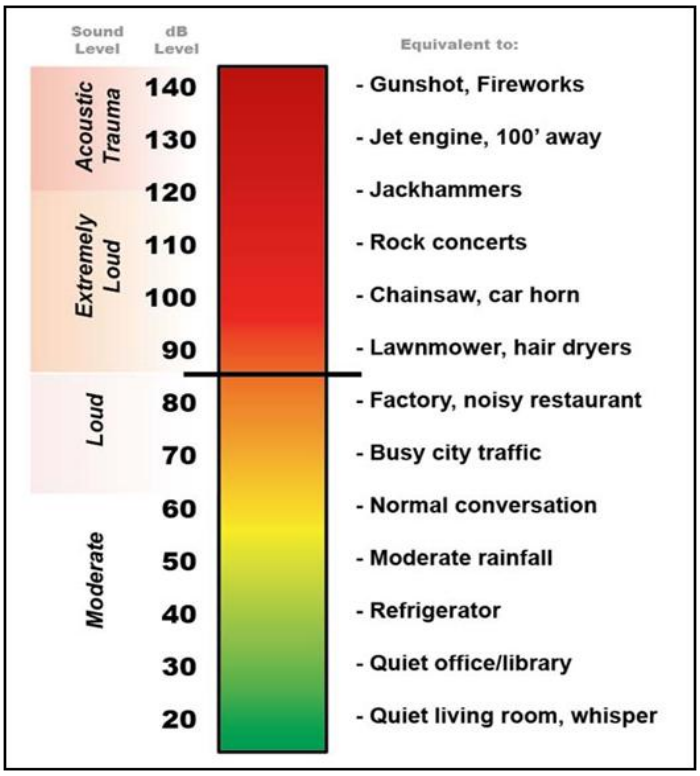

Figure 5. Examples of the sound level and decibel (dB) level of a variety of sources.

3.5. WATER QUALITY

Many Mississippi River water quality issues of today resemble the issues of the early 1970s, but their relative importance has shifted in the past 35 years. Water pollution control measures have reduced point source pollutant inputs from industrial and municipal discharges. This has, in turn, reduced many serious water quality problems such as oxygen depletion caused by organic wastes, thermal pollution, oil slicks, phosphate detergent wastes, and sediments from larger construction sites. In addition, removal of lead from gasoline and the banning of some industrial chemicals such as polychlorinated biphenyls (PCBs) and pesticides such as chlordane, aldrin, dieldrin, and DDT (dichlorodiphenyltrichlorethane) have greatly reduced the amount of toxic substances in the Mississippi River. Pretreatment programs in larger cities have reduced discharges of heavy metals and other toxic materials from municipal wastewater treatment plants.

Despite these advances, the Mississippi River today is affected by water quality problems and challenges that include nutrients, sediments, toxics, and fecal bacteria. Toxic substances—metals and organic chemicals—are primarily legacy contamination issues, although there are continuing inputs, especially of pesticides. These substances have chronic ecosystem and human health impacts and are difficult to address, because river bottom sediments are the

primary reservoir and source of these materials in many reaches of the river. High counts of fecal bacteria, once a public health problem at raw sewage discharges all along the Mississippi River, were substantially reduced with the implementation of secondary sewage treatment in many areas. Today, some parts of the river—mainly near large municipalities—still experience fecal bacteria counts that exceed water quality standards.

3.6. COMMERCIAL NAVIGATION

The Mississippi River and L&D 25 are integral parts of a large navigation network. Primarily, the network serves as a transportation system for large barges carrying bulk commodities up and down the river system. It connects Midwest ports with destinations throughout the world. It also carries a substantial amount of small private boat traffic. It is a vital part of the local, regional, and national navigation transportation system.

3.7. RECREATION

A substantial amount of recreation activity occurs in and around L&D 25. The proximity of the site to St. Louis makes it an attractive outdoor recreation area. People are attracted to the river because of the resources and recreational opportunities that it offers. The area is used heavily by hunters, fishermen, birdwatchers, picnickers, recreational boaters, and walkers. Many people enjoy coming to L&D 25 to observe the barges as they make their way along the river and through the lock. The L&D 25 project area provides a useful public bank-side access point to the river and the parking lot is important for many activities.

In the fall and winter months, the lower portion of Pool 25 is used heavily by waterfowl hunters. Numerous hunting blinds can be seen near the Batchtown Waterfowl Management Area. The parking lot at L&D 25 is the designated parking area for hunters using Sandy Island Conservation Area. Fishing is a popular activity, both in Sandy Slough and in the river. Bank fishermen use the parking lot to access the area upriver of the dam.

Sandy Island is a good location for bird watching because of its location on the river and diversity of habitat such as bottomland hardwoods, buttonbush swamp, open water, and maintained grassland. The Audubon Society lists Sandy Island as a good birding location. One of the most popular uses of the project area is eagle watching. Large numbers of eagles use the river during the winter and are drawn specifically to L&D 25 due to the abundance of forage in the tailwaters. Many people come to observe the eagles roosting in the trees and foraging over the river. Most use the L&D 25 parking lot to access viewpoints along Sandy Slough and below the dam. A hiking trail is provided alongside the lock to allow people to view eagles near the tailwaters. Lock and Dam 25 is important to the region because of the easy access and ample opportunity it provides for recreational access to the river.

3.8. SOCIO-ECONOMIC RESOURCES

The proposed L&D 25 project area is surrounded by rural land with low population densities. Lincoln County has exhibited significant population growth over the past three decades, while the population of Calhoun County has decreased slightly. Employment in the area is mainly in the construction, manufacturing, retail trade, and service industries. Agriculture is the largest single land use. Additional socioeconomic indicators are provided in Table 1.

Table 1. Socioeconomic Indicators for Regions Located Within the L&D 25 Project Area.

Socioeconomic Indicator	Winfield, MO	Lincoln County, MO	Calhoun County, IL
2010 Census Data			
Total Population	1,404	52,566	5,089
% White	97.0	95.0	98.9
% Black	0.4	1.9	0.1
% American Indian / Alaska Native	0.0	0.3	0.2
% Asian	0.3	0.4	0.2
% Native Hawaiian/ Pacific Islander	0.1	0.0	0.0
% Other	0.9	0.6	0.2
% Multiple	1.3	1.8	0.4
% Hispanic	1.3	2.0	0.8
Median Age	31.0	35.6	44.6
Average Household Size	2.61	2.75	2.40
Average Family Size	3.10	3.14	2.90
Total Housing Units	568	21,011	2,835
2000 Census Data			
Median Home Value	77,100	102,200	61,600
% High School Graduate or Higher	36.3	42.8	44.6
% Bachelor's Degree or Higher	5.6	6.5	6.1
% in Labor Force	64.2	68.5	60.3
% Unemployed	1.3	3.3	2.9
Median Household Income	36,167	42,592	34,375
Median Family Income	45,536	47,747	43,107
Per Capita Income	17,740	17,149	16,785
% Families Below Poverty Level	10.0	6.2	9.7
% Individuals Below Poverty Level	15.8	8.3	9.0

The economic importance of the Upper Mississippi River – Illinois Waterway (UMR-IWW) was described in the Corps' 2004, UMR-IWW System Navigation Feasibility Study - Final Feasibility Report and Programmatic EIS as follows:

"The existence of a cost-effective, efficient transportation system created by the locks and dams on the UMR-IWW System has provided stimulus for the growth of river communities and the entire Midwest region. Midwest producers rely on low-cost river transportation to compete in world markets. The UMR-IWW System has proven to be an efficient and cost-effective means of transporting a variety of goods and is vital to our national economy. The Upper Mississippi River navigation system provides a low cost transportation route for interregional and international trade, and it has allowed the rural agricultural-based economy of the Midwest to flourish by providing an outlet for markets out of the region (Bray et al. 2004). Maintaining the efficiency of the navigation system is also important to the economy of the local areas. The ability of tons of consumer goods to reach local communities in the study-area states via the river system positively impacts the lives of the residents of those states (Bray et al. 2004). The UMR-IWW System provides many benefits to the regions, states, and counties along the river corridor and the Nation as a whole. Benefits are derived from the employment and income generated from transportation of goods, recreation, hydropower production, and water supply for municipalities, commercial, industrial and domestic use. The existing system generates an estimated $0.8 billion to $1.2 billion (2001 prices) of annual transportation cost savings (using 2000 traffic levels)."

3.9. ENVIRONMENTAL JUSTICE

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)

- "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. Census Block Group statistics from the 2010 and U.S. Census and Environmental

Systems Research Institute estimates were utilized for this analysis. Figures 6 and 7 display the geographic location of the census block groups within the project area.

Table 1 presents demographic statistics for Lincoln County, Missouri, Calhoun County, Illinois, and the community of Winfield, Missouri. Demographic data from the 2010 Census and ESRI estimates indicate that the proposed project occurs in the vicinity of a population which is predominantly non-minority, and with none of the block groups being defined as a "poverty area". Poverty areas are census tracts or block numbering areas (BNA's) where at least 20 percent of residents were poor (below poverty level).

3.10. HAZARDOUS AND TOXIC WASTES (HTRW)

A Phase I environmental site assessment was performed in general conformance with the scope and limitations of the ASTM standards E-1527-05 and E1528-06 and the Standards and Practices for All Appropriate Inquiries (AAI), 40 CFR Part 312. The information was obtained through project meetings and reviews of reports, records and environmental databases.

A review of the readily available electronic records of the U.S. Environmental Protection Agency (EPA) EnviroMapper and the Coast Guard National Spill Response Center databases was conducted to identify superfund sites, toxic releases, or hazardous waste sites within, or directly adjacent to the potential project sites. No findings were discovered during the project meetings or reported by the EPA or the Coast Guard National Spill Response databases.

This Phase I assessment did not reveal any evidence of hazardous, toxic or radioactive wastes and found the likelihood of encountering such materials in connection with this project highly unlikely. A Phase II ESA is not necessary for the proposed project.

However, a Site Health and Safety Plan, and a Quality Control Plan should be required, discussed and implemented to avoid any environmental hazards. If any evidence of RECs are discovered during construction activities, operations should cease until the Environmental Quality section of the St. Louis District Corps of Engineers is able to assess the project area.

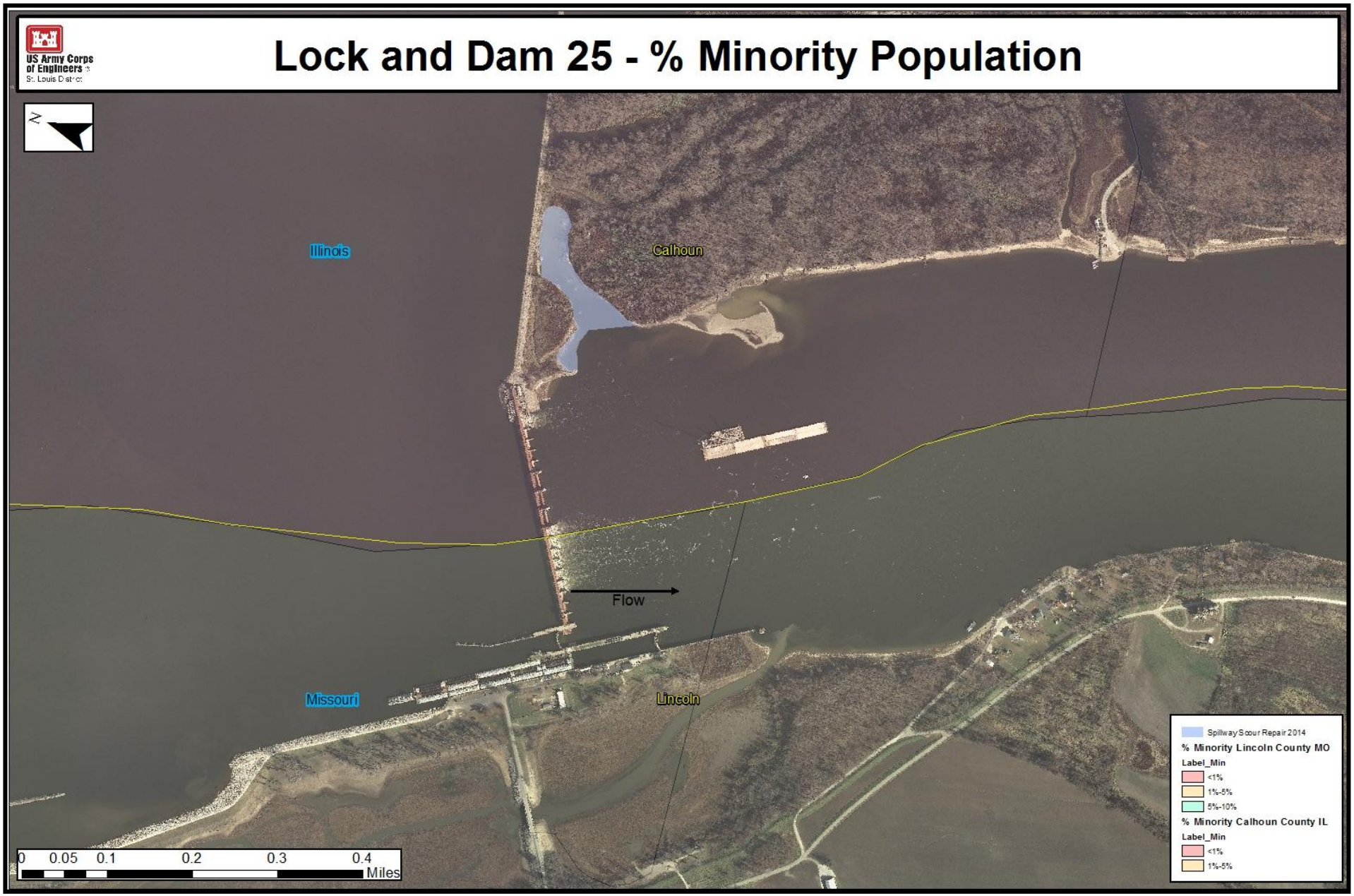

Figure 6. Percent of minority population in the vicinity of the L&D 25 overflow dike scour IRRM project.

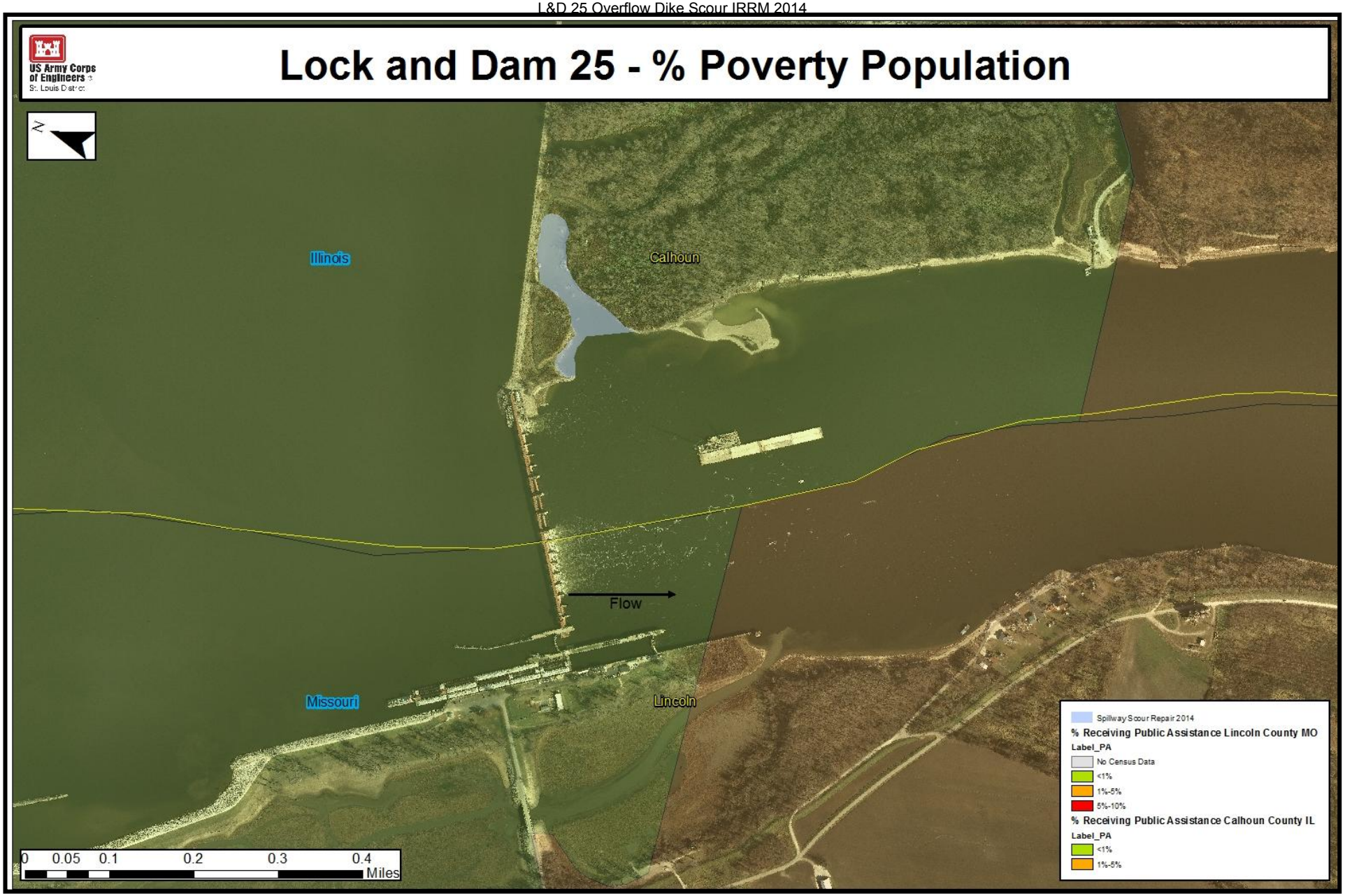

Figure 7. Percent of poverty population in the vicinity of the L&D 25 overflow dike scour IRRM project.

3.11. CULTURAL RESOURCES AND TRIBAL COORDINATION

Congress has, historically, passed legislation for the preservation of cultural resources beginning with the Antiquities Act of 1906. Generically defined, cultural resources are objects or sites representing human occupation of the land. A cultural resource may be an historic old building, a prehistoric site, a battlefield, a statue, or any other object or location. The legislative history for historic preservation expresses the intent of Congress to ensure that the nation's rich heritage is preserved and that Federal agencies consider the effects or their actions upon cultural resources. The National Historic Preservation Act of 1966 (NHPA, or the Act), as amended, specifically requires every Federal agency to consider the effects of an undertaking or project upon cultural resources and outlines a process to ensure the same. However, the statute does not mandate the preservation of all cultural properties. Rather, the statute provides for protection of "historic properties or resources," which are legally defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on the National Register [of Historic Places], including artifacts, records, and material remains related to such a property or resource" (Section 301 of NHPA). In addition, the Act states that "properties of traditional religious and cultural importance" to Native American tribes or Native Hawaiian organizations may be eligible for inclusion on the National Register (Section 101(d)(6)(A) of the Act). The intent of the Act is to preserve those historic properties that represent significant events, people, achievements, or have the ability to provide information about prehistory. Additional legislation, executive orders, and regulations have refined and clarified the goals and procedures of historic preservation.

The overflow dike area today is situated just north of Maple (Maxey) Island. Comparison with an 1881 map of the river indicates that the island has been created since the construction of the overflow dike (Figure 8). There have been no surveys to identify cultural resources on Maple Island as its recent origin would preclude the presence of historic properties. The area of the scour hole was part of the river in 1881 and has served as a overflow outlet for the overflow dike since its construction.

Based upon elevations and soundings, the scour hole, which has a depth to elevation 405 above mean sea level, extends approximately 10 feet below the river bottom indicated in the 1881 survey map. There are unlikely to be any historic properties in the work area.

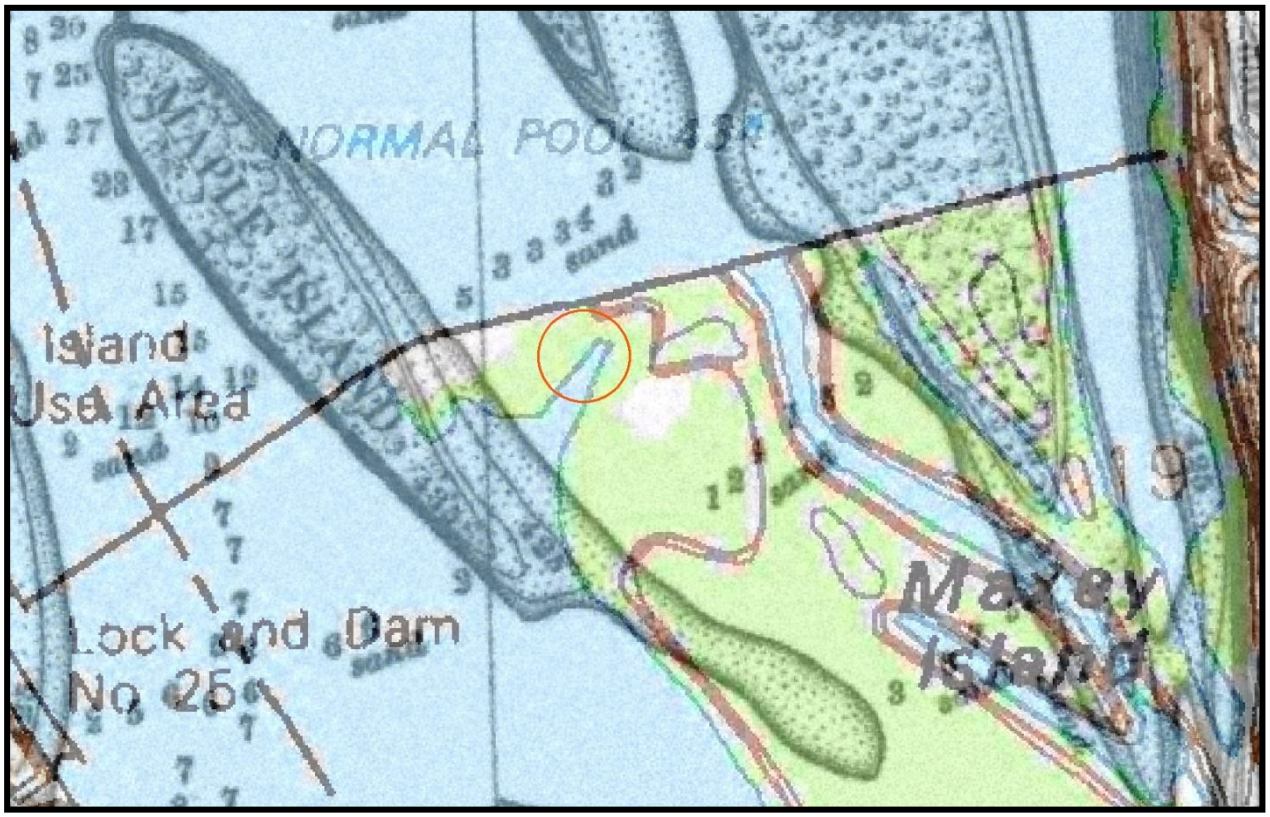

Figure 8. The L&D 25 overflow dike. Location of scour hole is indicated by red circle. The base map is an 1881 Mississippi River survey map, which is overlain by a modern topographic map (Foley, IL). The majority of Maple (Maxey) Island was created by sediments deposited after the spillway was constructed.

3.12. Biological Resources

3.12.1. Terrestrial Habitat and Wildlife

The terrestrial habitat near the L&D 25 area is typical of the region and includes agricultural land, hardwood forests, old fields, maintained grassland, and early successional forest.

On the protected side of the levee in Missouri, there is a typical mix of modern large river floodplain habitat. Agriculture dominates the landscape with limited interspersions of brushy fencerows and ditches. Areas too wet to farm support stands of bottomland hardwoods and buttonbush swamps. Some areas support crops and/or natural wetland vegetation as part of waterfowl management and hunting operations.

On the river side of the levee, bottomland hardwoods dominate the available habitat. Cottonwood, sycamore, and silver maple are the most common species. Pin oak and

persimmon are found sporadically. Several savannah type woodlands occur nearby. These areas typically have scattered mature pin oaks and cottonwoods with an understory of reed canary grass and occasional buttonbush. Lowland buttonbush swamps and oxbow sloughs occur in remnant swales and other low lying areas.

The areas immediately around the levees and dam are maintained grassland. Old field habitat is interspersed in small patches, mainly near old home sites and on recently fallow farm fields.

The Illinois side of the project area is quite different than Missouri. Steep bluffs rise from the banks of the river creating rolling uplands covered with hardwoods. Heavy mast species such as oak and hickory are common here. Most of the floodplain on the Illinois side is upstream of the dam and is submerged by the navigation pool.

A variety of terrestrial wildlife species occupy the project area on a permanent and seasonal basis. Whitetail deer, coyote, red fox, turkeys, squirrels, rabbits, raccoons, opossums, beaver, and muskrat are common throughout the year. A number of turtles and frogs utilize the wetlands and marshes. Migratory waterfowl are very common in the area from late fall to early spring. Many migratory birds utilize the river corridor as a migration pathway in the spring and fall.

3.12.2. AQUATIC HABITAT AND WILDLIFE

The Mississippi River is the largest river in North America and its watershed drains most of the central United States from the Rocky Mountains to the Appalachians. Lock and Dam 25 lies within the Lower Impounded Reach of the Upper Mississippi River System, just up-river from the confluence with the Illinois River.

Sandy Slough is a wide, seasonally influenced backwater that separates Bradley Island and Sandy Island from the floodplain in Missouri. Sandy Slough, also called Sandy Chute, once carried downstream flow from the Mississippi River. However, it was cut off on its upstream end when the LD25Sandy Slough dike was constructed in the 1930s. Sandy Slough remains connected to the Mississippi River on its downstream end. The depth of water in Sandy Slough is determined by the river stage in Pool 26. Sometimes the slough is filled with substantial amounts of water and other times it is mostly drained.

Pool 25 supports persistent fish and mussel populations. Ecological Specialists, Inc. (ESI) has mussel beds mapped along the left and right descending banks upstream from L&D 25 (ESI 2014) (Figure 9).

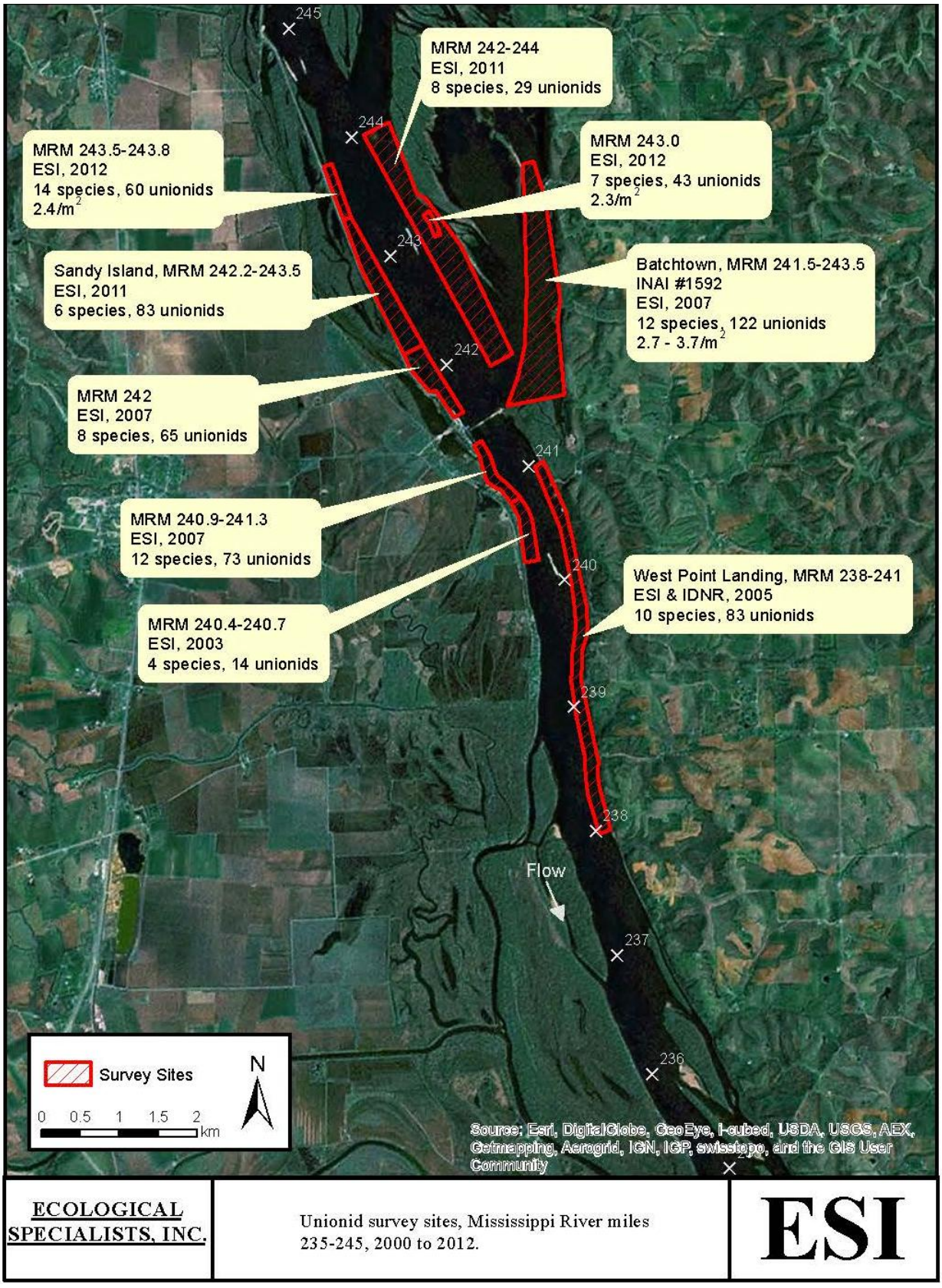

Figure 9. Known mussel beds in the vicinity of the L&D 25 overflow dike scour IRRM project.

The tailwaters below the dam are more typical of a natural river system. Flows are steady and strong and water is usually within the normal banks. Aquatic species accustomed to swift, steady current can be found here. The 2014 ESI report indicated that there are mussel beds downstream of the dam (ESI 2014). However, it is likely that the current is too swift and the water is too deep to support a large population of mussels immediately downstream from the L&D (Figure 9).

Fishes present in the area of L&D 25 are typical for this reach of the Mississippi River (Pflieger 1997). Dominant species include bluegill (*Lepomis macrochirus*), black crappie (*Pomoxis nigromaculatus*), white crappie (*Pomoxis annularis*), channel catfish (*Ictalurus punctatus*), blue catfish (*Ictalurus furcatus*), flathead catfish (*Pylodictis olivaris*), common carp (*Cyprinus carpio*), and freshwater drum (*Aplodinotus grunniens*). In addition, lake sturgeon (*Acipenser fulvescens*) is likely to occur near the lock and dam. Deep holes in the vicinity of L&D 25 may provide fish with overwintering habitat.

During most times of the year, L&D 25 acts as an impediment to upstream fish passage. During periods of high flow, the dam will go to open river conditions where the gates are completely lifted out of the water and the river flows with less restraint. During this time, fish can pass through the dam.

Sandy Slough's natural hydroperiod makes it valuable habitat. During high-water events, the slough fills with water and provides good backwater habitat. It can serve as a rest area and as a potential spawning and rearing location for fish. During drier times of the year, the three mile portion of Sandy Slough above the L&D 25 bridge supports moist soil conditions and is bisected by a sinuous and braided creek channel. Dense emergent marsh vegetation appears and provides good nursery and escape habitat for young fish. The lack of deepwater prevents Sandy Slough from providing sufficient wintering habitat for fish.

3.12.3. WETLANDS

Wetlands are defined as "Those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR Part 328.3b).

Because of its position in the regional ecosystem, substantial wetland resources exist in the vicinity of L&D 25. These include emergent wetlands, buttonbush swamps, forested wetlands, bottomland hardwood forests, emergent riparian fringes, and farmed wetlands. Bottomland hardwood forests consist primarily of medium to large silver maple, cottonwood, and

sycamore. Maple Island is designated as wetland habitat. The proposed project area is open water habitat. The proposed primary stockpile area is currently exposed mud with very little vegetation (Figure 10).

Figure 10. Aerial photo of the proposed primary stockpile area, taken on 5 November 2014, at a L&D 25 tailwater elevation reading of 423.03 feet.

3.12.4. Wildlife Refuges, Conservation Areas, and Management Areas

Several private, state, and federally managed areas exist in the vicinity of L&D 25. Sandy Island Conservation Area and the Upper Mississippi Conservation Area are managed by the Missouri Department of Conservation (MDC). The B.K. Leach Conservation Area is also managed by MDC and is located just north of Sandy Island. Batchtown State Fish and Waterfowl Management Area is managed by the Illinois Department of Natural Resources (ILDNR) and the U.S. Fish and Wildlife Service (USFWS) and is located northeast of L&D 25. The USFWS Service also has nearby refuges at Clarence Cannon Wildlife Refuge, Two Rivers Wildlife Refuge and Mark Twain National Wildlife Refuge (Batchtown Division). The U.S. Army Corps of Engineers owns numerous parcels along the river, most of which are leased to other agencies and are maintained as wildlife habitat. The Nature Conservancy owns and manages an eagle sanctuary on a parcel of wooded land approximately 300 yards west of the lock and dam facilities. Four Illinois Natural Area Inventory (INAI) sites occur in the vicinity of L&D 25. These include Batchtown Mussel Bed, Cap Au Gris, West Point Landing Geographical Area, and the Mississippi River- Cap Au Gris site.

The Batchtown Division of the Mark Twain National Wildlife Refuge and Management Area (Batchtown) is located just above the lock and dam, at MRM 242 to 248, and harbors a diverse mussel bed.

3.12.5. BALD EAGLE

On August 9, 2007, the bald eagle (*Haliaeetus leucocephalus*) was removed from the federal list of threatened and endangered species. Even though they are federally delisted, bald eagles are still protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

The bald eagle is identified as breeding and/or wintering along the Mississippi River. Winter use is highest where the river is ice-free and adequate perch sites are available. These areas are important, providing stable feeding sites during high caloric demand periods. Large concentrations of eagles often are associated with open water areas bordered by suitable perch trees. Trees within 100 feet of the shore are preferred (USFWS 2000).

3.13. THREATENED AND ENDANGERED SPECIES

In compliance with Section 7(c) of the Endangered Species Act of 1973, as amended, the St. Louis District biologist consulted the U.S. Fish and Wildlife listing of federally threatened or endangered species, currently classified or proposed for classification, that may occur in Calhoun County, Illinois, and Lincoln County, Missouri at (http://www.fws.gov/midwest/endangered/) on 17 November 2014. According to the web site, four federally listed species and one proposed species may be present in the counties (Table2). There is no federally designated critical habitat in the proposed project area. The Biological Assessment (BA) below addresses the federally listed species specific to this proposed project.

An account of Illinois state listed species was obtained from the Illinois Department of Natural Resources' Ecological Compliance Assessment Tool (EcoCAT) for the proposed project area at (http://dnr.illinois.gov/EcoPublic/) on 14 November 2014. Two state species were identified as potentially occurring in the vicinity of the proposed project (Table 2).

Threatened or Endangered species known to occur in Lincoln County, Missouri were obtained from the Missouri Natural Heritage Program website at (http://mdc.mo.gov/your-property/greener-communities/heritage-program/results/county/Lincoln) on 20 November 2014. Two state listed species were identified as known to occur in Lincoln County (Table 2).

Table 2. Federal and state threatened, endangered, and candidate species potentially occurring in Calhoun County, Illinois, and Lincoln County, Missouri.

Common Name	Scientific Name	Status	County	Habitat
Indiana bat	*Myotis sodalis*	FE	Calhoun, Lincoln	Hibernacula = Caves and mines; Maternity and foraging habitat = small stream corridors with well developed riparian woods; upland forests
Northern long-eared bat	*Myotis septentrionalis*	P-FE	Calhoun, Lincoln	Hibernates in caves and mines - swarming in surrounding wooded areas in autumn. Roosts and forages in upland forests during spring and summer.
Decurrent false aster	*Boltonia decurrens*	FT	Calhoun, Lincoln	Disturbed alluvial soils
Eastern prairie fringed orchid	*Platanthera leucophaea*	FT	Calhoun	Mesic to wet prairies
Running buffalo clover	*Trifolium stoloniferum*	FT	Lincoln	Disturbed bottomland meadows
Butterfly mussel	*Ellipsaria lineolata*	IL-ST	Calhoun	Large rivers in sand or gravel.
Lake Sturgeon	*Acipenser fulvescens*	IL-ST M-SE	Calhoun Lincoln	Large rivers over firm sand, gravel or rocky bottom

American Bittern	*Botaurus lentiginosus*	M-SE	Lincoln	Occur in marshes, wet meadows and sloughs with emergent vegetation and permanent water 8-13 inches deep.
King Rail	*Rallus elegans*	M-SE	Lincoln	Inhabit wetlands dominated by sedges, preferably associated with riverine floodplain systems. Require shallow water or saturated soil.

FE – Federally endangered, FT – Federally threatened, SE – State endangered, ST – State threatened, M- Missouri, I- Illinois, P - Proposed

4. ANTICIPATED ENVIRONMENTAL IMPACTS

4.1. PHYSICAL SETTING

The scour downstream of the overflow dike would be addressed by filling the area with sand, reestablishing the bankline, and armoring the newly placed dredge material. A preferential flow path would be established on the armored surface to prevent future scour and flanking of this IRRM. The physical setting would be restored to pre-scour conditions. It is anticipated that sediment may be deposited in the interstitial spaces among the rocks, and that vegetation would become established.

4.2. AESTHETICS

Aesthetic impacts due to construction activities in the vicinity of the site would be temporary. Stockpile areas for rock would be established on near the toe of the overflow dike and would be removed once work is complete. No long term aesthetic impacts are anticipated

4.3. AIR QUALITY

Emissions from equipment, as well as dust would be generated during project construction. However, no adverse long-term air quality impacts are anticipated to occur in the region as a result of the proposed action.

4.4. Noise

The noise level would increase during project construction, which is estimated to occur over a period of 60 days. The overall long-term noise level would not increase. Noise may unsettle organisms in the area, especially during dredging and rock placement.

4.5. Water Quality

Temporary increases in turbidity may occur during filling of the scour hole and placement of the rock revetment. Placement of fill material and operation of floating-plant equipment may contribute to temporary turbidity. Turbidity levels are expected to return to pre-construction levels after construction is complete. No long-term impacts to water quality are anticipated. No violations of any State of Illinois or State of Missouri water quality standards are anticipated.

4.6. Commercial Navigation

The proposed project should have no impact on commercial navigation. In this area of the river, the navigation channel is located along the opposite bank. A notice to the commercial navigation industry should be issued as a precaution.

4.7. Recreation

The proposed project is located at the toe of the overflow dike, which is off limits to the public. Therefore, no impacts to recreation are anticipated as a result of the scour IRRM.

4.8. Socio-Economic Resources

The proposed project is an IRRM to existing infrastructure below ordinary high water. No significant impacts to the growth of the community or region would be realized as a direct result of the tentatively selected plan. However, the existence of a cost-effective, efficient transportation system provided by the Upper Mississippi River locks and dams has historically provided stimulus for growth of river communities and the entire Midwest region. The proposed project would act to maintain a safe, reliable, efficient, and sustainable navigation system.

4.9. Environmental Justice

The proposed project would not disproportionately affect low income or minority populations.

4.10. Hazardous and Toxic Wastes (HTRW)

A Phase I environmental site assessment was performed in general conformance with the scope and limitations of the American Society for Testing and Materials (ASTM) standards E-1527-05 and E1528-06 and the Standards and Practices for All Appropriate Inquiries (AAI), 40 CFR Part

312 for the L&D 25 overflow dike scour IRRM project. This Phase I assessment did not reveal any evidence of hazardous, toxic or radioactive wastes and found the likelihood of encountering such materials in connection with this project highly unlikely. A Phase II ESA is not necessary for the proposed project. However, a Site Health and Safety Plan, and a Quality Control Plan should be required, discussed and implemented to avoid any environmental hazards. If any evidence of recognized environmental conditions are discovered during construction activities, operations should cease until the Environmental Quality section of the St. Louis District Corps of Engineers is able to assess the project area.

4.11. Cultural Resources and Tribal Coordination

As indicated in Section 3.11, there have been no cultural resources surveys within the proposed project's area of effect. The impact in the area of the scouring will consist of filling the hole with dredge material obtained from the river bottom. Based upon the nature of the impacts and the location of the project area, it has been determined that there will be no significant impacts to historic properties.

Previous consultation with affiliated Native American Tribes regarding work in the Mississippi River resulted in an understanding that the tribes did not want to be notified or consulted on actions such as the removal of dredge materials from the river, the placement of dredge material back in the river, and the performance of non-ground disturbing tasks. Therefore, no consultation will be required for the Lock and Dam 25 overflow dike project. Should any human remains or other culturally sensitive items be discovered during this project, work will be halted immediately and consultation will be initiated.

4.12. Biological Resources

4.12.1. Terrestrial Habitat and Wildlife

The proposed project is a IRRM to existing infrastructure below ordinary high water. No trees or vegetation will be removed from terrestrial habitat. Wildlife such as whitetail deer, coyote, red fox, turkeys, squirrels, rabbits, raccoons, opossums, beaver, muskrat, turtles, frogs, and migratory waterfowl may relocate from the immediate project vicinity during construction activities. Impacts are deemed minor and short-term.

4.12.2. Aquatic Habitat and Wildlife

Because construction would occur within the waters of the Mississippi River, direct impacts to aquatic habitat would be unavoidable. Permanent rock would be placed in the river and retrieval would be impractical and costly. The IRRM would not impair the aquatic ecosystem's capability to sustain life, or reduce the suitability of the Mississippi River for populations of

aquatic organisms. The benthic invertebrate community within the footprint of the IRRM would be lost. Fishes are anticipated to relocate from the IRRM area due to construction activities. The rock IRRM structure could result in the formation of distinctive habitat (rock riffles) during in certain river levels. There are no known mussel beds located within the project footprint. Dredging activities will avoid known mussel beds.

4.12.3. WETLANDS

Approximately 5.3 acres of open water will be filled in by sand and/or stone and tied into the adjacent bankline. It is anticipated that this area will convert to terrestrial wetlands over time, or may exist as submerged wetlands, depending on river level and flow patterns. An additional 2.5 acres of mudflat will be used as a temporary stockpile area for stone. The area will be restored to its origninal condition at the completion of the project.

4.12.4. WILDLIFE REFUGES, CONSERVATION AREAS, AND MANAGEMENT AREAS

The Sandy Island Conservation Area (MO), Upper Mississippi Conservation Area (MO), B.K. Leach Conservation Area (MO), Clarence Cannon Wildlife Refuge (MO), Batchtown State Fish and Waterfowl Management Area (IL), Two Rivers Wildlife Refuge (IL), and the Mark Twain National Wildlife Refuge (IL) are all located upstream of the project area. Additionally, four Illinois Natural Area Inventory (INAI) sites occur in the vicinity of L&D 25. These include Batchtown Mussel Bed, Cap Au Gris, West Point Landing Geographical Area, and the Mississippi River- Cap Au Gris site, all of which are outside of the project boundaries. There are no anticipated impacts to any parks, national and historic monuments, national seashores, wild and scenic rivers, wilderness areas, research sites, etc.

4.12.5. BALD EAGLE

Bald eagles are occasionally present in winter feeding in the tailwater area and perching in the larger roost trees when there is ice on the river. Neither the staging area nor the construction footprint (aquatic habitat) will occur in suitable habitat for bald eagles. Bald eagles could be temporarily disturbed from noise and increased construction traffic as they feed in the tailwater area and perch or roost in large riparian trees. This would be a minor temporary impact.

Two bald eagle nests are located north and west of the lock and dam approximately 1700 feet from the project area. These nests are not visible from the project area. The proposed IRRMs do not include any riparian or inland tree clearing for any project feature including the stockpiling areas. No construction would occur when the river is iced over and eagles would be concentrated in the tailwater.

4.13. THREATENED AND ENDANGERED SPECIES BIOLOGICAL ASSESSMENT

This Biological Assessment (BA) assesses potential impacts to the four federally listed species and one species proposed for federal listing that may be present in the project area at Lock and Dam 25.

INDIANA BAT (*MYOTIS SODALIS*)

The federally endangered Indiana bat has been noted as occurring in several Illinois and Missouri counties. Potential habitat for this species occurs statewide, therefore, Indiana bats are considered to potentially occur in any area with forested habitat. 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. 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 species or size of tree does not appear to influence whether Indiana bats utilize a tree for roosting, provided the appropriate bark structure is present. However, the use of a particular tree does appear to be influenced by weather conditions, such as temperature and precipitation.

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.

Disturbance and vandalism, improper cave gates and structures, natural hazards such as flooding or freezing, microclimate changes, land use changes in maternity range, and chemical contamination are the leading causes of population decline in the Indiana bat (USFWS 2000, 2004).

Neither the stockpile areas nor the construction footprint (deepwater aquatic habitat) will occur in suitable habitat for Indiana bats. This project does not include any riparian or upland tree clearing for any project feature including stockpile areas. There are no caves or abandoned mines in the immediate project vicinity. In the unlikely event that the project

extends into the spring, the St. Louis District has determined that the proposed project “may affect but is not likely to adversely affect" the Indiana bat.

NORTHERN LONG-EARED BAT (*MYOTIS SEPTENTRIONALIS*)

The northern long-eared bat is a proposed for listing as a federally endangered species throughout its range (Federal Register 2 October 2013). 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 and within the King’s Lake Drainage District.

In the unlikely event that the project extends into the spring, the St. Louis District has determined that the proposed project “may affect but is not likely to adversely affect" the northern long-eared bat.

DECURRENT FALSE ASTER (*BOLTONIA DECURRENS*)

The decurrent false aster is listed as threatened and is presently known from scattered localities on the floodplains of the Illinois River, and Mississippi River from its confluence with the Missouri River south to Madison County, Illinois. Decurrent false aster grows in wetlands, on the borders of marshes and lakes, and on the margins of bottomland oxbows and sloughs. Historically, this plant was found in wet prairies, marshes, and along the shores of some rivers and lakes. Decurrent false aster favors recently disturbed areas, and flooding may play a role in maintaining this habitat type. Current habitats include riverbanks, old fields, roadsides, mudflats and lake shores.

The St. Louis District has determined the proposed project will have “no effect” on decurrent false aster since no populations are known to exist in the proposed project area.

EASTERN PRAIRIE FRINGED ORCHID (*PLATANTHERA LEUCOPHAEA*)

The eastern prairie fringed orchid was added to the U.S. List of Endangered and Threatened Species on September 28, 1989. It occurs in a wide variety of habitats, from mesic prairie to wetlands such as sedge meadows, marsh edges, even bogs. It requires full sun for optimum

growth and flowering and a grassy habitat with little or no woody encroachment. Flowering begins from late June to early July, and lasts for 7 to 10 days. Blossoms often rise just above the height of the surrounding grasses and sedges. The more exposed flower clusters are more likely to be visited by the hawkmoth pollinators, though they are also at greater risk of being eaten by deer. Seed capsules mature over the growing season and are dispersed by the wind from late August through September.

Early decline was due to the loss of habitat, mainly conversion of natural habitats to cropland and pasture. Current decline is mainly due to the loss of habitat from the drainage and development of wetlands. Other reasons for the current decline include succession to woody vegetation, competition from non-native species and over-collection.

The St. Louis District has determined the proposed project will have "no effect" on eastern prairie fringed orchid since the project will not impact prairie or terrestrial wetland areas.

RUNNING BUFFALO CLOVER (*TRIFOLIUM STOLONIFERUM*)

Running buffalo clover was listed as federally endangered in 1987. It is known to occur in 101 populations in three geographical regions: Appalachian (West Virginia and southeastern Ohio), Bluegrass (southwestern Ohio, central Kentucky and Indiana), and the Ozarks (Missouri). The majority of populations occur within the Appalachian and Bluegrass regions, with the largest population in West Virginia and the most populations in Kentucky.

Running buffalo clover occurs in mesic habitats of partial to filtered sunlight, where there is a prolonged pattern of moderate periodic disturbance, such as mowing, trampling, or grazing. It is most often found in regions underlain with limestone or other calcareous bedrock. The primary threat to running buffalo clover is habitat alteration. Factors that contribute to this threat include natural forest succession, and subsequent canopy closure, competition by invasive plant species, permanent habitat loss through development or road construction, and may include the elimination of bison and other large herbivores.

The St. Louis District has determined the proposed project will have "no effect" on running buffalo clover since no populations or mesic habitat exist in the proposed project area.

BUTTERFLY MUSSEL (ELLIPSARIA LINEOLATA)

The butterfly mussel is listed as threatened by the state of Illinois. It usually inhabits areas of large rivers with swift currents in sand or gravel substrates. However, it appears that the butterfly has adapted to life in reservoirs in some southern states, where it is found in water depths up to 6 m (20 ft) (Parmalee and Bogan 1998). Known fish hosts for the glochidia of the

butterfly mussel include freshwater drum (*Aplodinotus grunniens*), green sunfish (*Lepomis cyanellus*), and sauger (*Stizostedion canadense*). Although the butterfly prefers waters in large rivers, repeated dredging and channelization activities destroy mussel habitat and may kill or remove the mussels themselves. In addition, impoundment structures tend to promote siltation, which is known to smother and kill mussels. Reasons for population decline include commercial harvest for buttons, dam construction, channelization projects, and continued non-point source pollution from agriculture and urban areas.

Known mussel populations are identified in Figure 9, as well as in the construction contracts; and no dredging, filling, fleeting, or other potentially damaging activities are permitted in these areas.

LAKE STURGEON (ACIPENSER FULVESCENS)

The lake sturgeon is listed as threatened by the state of Illinois, and endangered by the state of Missouri. Lake sturgeon are found in the Missouri and Mississippi river basins and spend most of their time in the main channels of these large muddy rivers. These bottom-dwelling fish prefer strong current and live in areas having firm substrate. Lake sturgeon mature slowly and can live up to 150 years, reaching eight feet in length and a weight of 300 pounds. Like most other long lived species, it takes sturgeon a long time to reach sexual maturity. It takes 15 to 20 years (25 - 40 lbs. in size) before a lake sturgeon can spawn for the first time. A female lake sturgeon only spawns once every 3 to 5 years. Because of this fact, sturgeon are very susceptible to over harvest. Sturgeon are extremely migratory fish and it's not unusual for them to travel hundreds of miles each year. Each spring, rising water levels and water temperature trigger sturgeon spawning migrations. Spawning for Missouri's sturgeons usually occurs when water temperatures are from 55 to 65°F with the peak of spawning occurring during the first week or two of May. Male sturgeon fertilize the adhesive eggs of the female as they are broadcast over gravelly areas. Sturgeon feed on the bottom using their highly protrusible mouth to suck up their food. Their diet consists primarily of larval aquatic insects, crayfish, snails, small clams, and small fish. As lake sturgeon grow larger, their dependency on small fish for food increases. Many factors have contributed to the decline of this species including habitat alterations by humans to the Missouri and Mississippi rivers, over harvest, pollution, and hybridization. However, habitat loss and past, unregulated commercial fishing are the primary reasons for their decline.

Fishes are anticipated to relocate from the immediate IRRM area due to construction activities.

AMERICAN BITTERN (*BOTAURUS LENTIGINOSUS*)

The American bittern is listed as endangered by the state of Missouri. It is usually solitary and well-hidden as it walks stealthily among cattails or bulrushes in bogs, marshes and wet meadows. It is most active at dusk. Like other members of the heron family, the American bittern feeds in marshes and shallow ponds, dining on amphibians, fish, insects, and reptiles.

This bittern winters in the southern United States and Central America. It summers throughout Canada and much of the US. This bird nests in isolated places with the female building the nest and the male guarding it. Two or three eggs are incubated by the female for 29 days, and the chicks leave after 6–7 weeks.

In general, the American bittern would not likely be affected because construction will be taking place in the river and no land or marsh areas will be cleared.

KING RAIL (*RALLUS ELEGANS*)

The king rail is listed as endangered by the state of Missouri. The king rail's breeding range has shrunk dramatically in the last 60 years. Once found regularly from the upper Midwest southward through eastern Texas, then eastward through the coastal plain, and up into New England, today, the king rail is largely restricted to the coastal plain from Texas through the lower Mississippi River Valley and all of Florida. This bird also occurs close to the Atlantic coastline north to New Jersey.

King rails are best supported by extensive wetlands with shallow water and a mosaic of plant species, such as grasses, cattails, sedges, and millet. These marsh birds prefer fresh water, but will also use brackish and tidal wetlands. King rails tend to breed in the center of marshes, but their chicks depend on drier areas for foraging.

Most often, king rails forage by walking through shallow water or over moist, thickly vegetated ground. Like other large rails, king rails are omnivorous. In the summer, their diet depends heavily on aquatic animals and insects, including crayfish, crabs, small fish, frogs, grasshoppers, and beetles. During fall and winter, they consume more aquatic plant seeds, especially millet and rice. King rails have also been known to eat small mammals and acorns.

In the southern United States, king rails form apparently monogamous pairs as early in the spring as February. Once formed, the pair defends territories from other rails. Constructed by both sexes, the grassy nest is hidden in dense grasses and sedges, and elevated above damp ground or shallow water. Young king rails begin to fly in about nine weeks, and families appear to break up before migration.

In general, the king rail would not likely be affected because construction will be taking place in the river and no land or marsh areas will be cleared.

4.14. Environmental Effects of Proposed Action

Table 3 summarizes the anticipated environmental effects of the proposed Lock and Dam 25 overflow dike scour IRRM project.

Table 3. Environmental effects of proposed action.

Environmental Factor or Resource	Alternatives	
	1-No Action	2- Repair Scour Hole
Physical Setting	O	O
Aesthetics	O	O
Air Quality	O	ST
Noise	O	ST
Water Quality	O	ST
Commercial Navigation	A	B
Recreation	O	O
Socio-Economic Resources	O	O
Environmental Justice	O	O
Hazardous and Toxic Wastes (HTRW)	O	O
Cultural and Tribal Resources	O	O
Terrestrial Habitat and Wildlife	O	O
Aquatic Habitat and Wildlife	O	ST, a
Wetlands	O	ST
Wildlife Refuges, Conservation Areas, and Management Areas	O	O
Bald Eagle	O	O
Threatened and Endangered Species	O	O

O = no anticipated impact, SA = significant adverse impact, A = adverse impact, a = small adverse impact, SB = significant beneficial impact, B = beneficial impact, b = small beneficial impact, ST = short term impact.

5. CUMULATIVE IMPACTS

Cumulative impacts include those impacts on the environment which result from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions. The cumulative effects analysis (CEA) for past, present and reasonably foreseeable actions on the UMR was presented in the Corps' *Final Integrated Feasibility Report and Programmatic Environmental Impact Statement for the UMR-IWW System Navigation Study*, dated September 2004, and is hereby incorporated by reference. As such, cumulative effects are only briefly discussed here. Generally, the CEA identifies that river regulation, sedimentation and floodplain development have contributed to the gradual decline in the UMR ecosystem health and quality, and continue to be primary stressors on that system. Environmental management and restoration efforts have not prevented system-wide habitat degradation in the past and increased efforts to improve aquatic habitats, vegetation succession and forest health are required to sustain ecosystem values. The CEA identified that true sustainability can only be met through the integration of upland and mainstem resource objectives and management actions, with integrated planning being a prerequisite to optimizing national benefits through efficient and effective adaptive river management. Implementation of ecosystem restoration features will contribute to offsetting adverse cumulative effects, including the ongoing effects associated with operation and maintenance of the navigation project.

6. PERMITS

The Corps of Engineers has determined that the activities will have no affect on endangered species, and are authorized under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 by an existing Department of the Army nationwide permit for Maintenance activities, as described in the 21 February 2012, Federal Register, Reissuance of Nationwide Permits; Notice (77 FR 10270), Appendix A (B) (3). This permit verification is valid until 18 March 2017 (on file in office).

The Illinois Environmental Protection Agency Division of Water Pollution Control (IEPA/WPC) has conditionally issued general Section 401 Water Quality Certification for this nationwide permit (No. 3 – Maintenance), subject to the special conditions and three general conditions. These conditions are part of the Corps authorization (on file in office).

The Illinois Department of Natural Resources (IDNR) Office of Water Resources (OWR) completed its review of the proposed work on 24 November 2014. The project has been determined to be repair of the overflow section of the dam under the IDNR OWR Dam Safety Program rules. Repair work does not require approval under those rules. IDNR OWR also

reviewed the restoration of the river bank section under their Floodway Construction rules. They suggest the work is exempt from the permit requirements as 'repair, to preserve design function, of artificially improved channels'.

7. RELATIONSHIP OF PLAN TO ENVIRONMENTAL REQUIREMENTS

Table 4 summarizes the project's compliance status with respect to applicable statutes.

Table 4. Federal policy compliance status.

Federal Policy	Compliance Status
National Environmental Policy Act, 42 USC 4321-4347	Partial[1]
Water Resources Development Acts of 1986, 1990, 2000 and 2007	Full
Migratory Bird Treaty Act of 1918, 16 USC 703-712	Full
Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601-9675	Full
Resource Conservation and Recovery Act, 42 USC 6901-6987	Full
Farmland Protection Policy Act, 7 USC 4201-4208	Full
Endangered Species Act, 16 USC 1531-1543	Partial[2]
Food Security Act of 1985, 7 USC varies	N/A
Land and Water Conservation Fund Act, 16 USC 460d-461	N/A
National Historic Preservation Act, 16 USC 470 et seq.	Partial[2]
Noise Control Act, 42 USC 7591-7642	Full
Clean Air Act, 42 USC 7401-7542	Full
Protection and Enhancement of the Cultural Environment (EO 11593)	Full
Floodplain Management (EO 11988 as amended by EO 12148)	Full
Protection of Wetlands (EO 11990 as amended by EO 12608)	Full
Protection and Enhancement of Environmental Quality (EO 11991)	Full
Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898)	Full
Protection of Migratory Birds (EO 13186)	Full
Bald and Golden Eagle Protection Act, 42 USC 4151-4157	Full
Clean Water Act, 33 USC 1251-1375	Full
Rivers and Harbors Act, 33 USC 401-413	Full
Fish and Wildlife Coordination Act, 16 USC 661-666c	Partial[2]

1 Full compliance after submission for public comment and signing of FONSI

2 Required permits, coordination will be sought during document review

8. COORDINATION, PUBLIC VIEWS, AND RESPONSES

This Draft Environmental Assessment and Unsigned Finding of No Significant Impact were sent to the following officials, agencies, organizations, and individuals for a 30 day review and comment period. Additionally, these documents were posted to the St. Louis District website at http://www.mvs.usace.army.mil/Portals/54/docs/pm/Reports/EA/L&D 25 Spillway Scour Repair Draft EA and Unsigned FONSI 2014 Combined Documents.pdf to provide access for all interested parties. All associated letters, comments, and responses will be filed with the final version of this document.

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To assure compliance with the National Environmental Policy Act, Endangered Species Act and other applicable environmental laws and regulations, coordination with these agencies would continue as required throughout the planning and construction phases of the proposed project.

9. ENVIRONMENTAL ASSESSMENT PREPARERS

Teri Allen, Ph.D., Aquatic Ecologist
Experience: 10 years private sector; 13 years Environmental Branch, USACE-MVS
Role: EA Coordinator, Environmental Impact Analysis, NEPA and Environmental Compliance

James E. Barnes, District Archaeologist
Experience: 8 years private sector; 19 years Center of Expertise, Curation and Maintenance of Archaeological Collections
Role: National Historic Preservation Act Analysis and Compliance

Richard D. Archeski, Environmental Engineer
Experience: 11 years USFWS, 11 years US Army, 13 years USACE-MVS Environmental Engineer
Role: HTRW Conduct Phase I

Alan Edmondson, Regulatory Specialist
Experience: 14 years USACE-MVS
Role: Regulatory Project Manager, Section 10 Rivers and Harbors Act and Section 404 Clean Water Act Analysis

Roberta Hayworth, Cultural Anthropologist
Experience: 17 years Mandatory Center of Expertise for the Curation and Management of Archaeological Collections
Role: District Tribal Liaison, Tribal consultation

10. REFERENCES

Ecological Specialists, Incorporated. 2014. Final Report Freshwater Mussel Habitat Construction / Creation Literature Review for the St. Louis District Portions of the Mississippi and Illinois Rivers and Similar Habitats. Ecological Specialists, Inc., O'Fallon, MO.

Parmalee, P.W., and A.E. Bogan. 1998. The Freshwater Mussels of Tennessee. The University of Tennessee Press, Knoxville, TN.

Pflieger, W.L. 1997. The Fishes of Missouri. Missouri Department of Conservation, Jefferson City, MO.

FINDING OF NO SIGNIFICANT IMPACT

Lock and Dam 25 Overflow Dike Scour Interim Risk Reduction Measure
Mississippi River, Mile 241.5
Calhoun County, Illinois
Lincoln County, Missouri

I. I have reviewed and evaluated the documents concerning the proposed Lock and Dam 25 Overflow Dike Scour Interim Risk Reduction Measure (IRRM) Project located in Calhoun County, Illinois, and Lincoln County, Missouri.

II. As part of this evaluation, I have considered:

a. Existing Resources and Future without Project Alternative (No Action).

b. Impact to Existing Resources with Alternative 2 - Repair the Overflow Dike Scour

III. The possible consequences of these alternatives have been studied for physical, environmental, cultural, social and economic effects, and engineering feasibility. Significant factors evaluated as part of my review included:

a. The IRRM involves dredging sand into the scour hole (via suction dredge or other mechanical means), reestablishing the river bankline with stone revetment, and armoring the surface of the newly placed dredge material with a layer of bedding stone and topped with larger stone. The surface of the riprap will form a shallow channel to provide a preferential path for water to flow back into the main channel during overtopping events. The edges of the stone riprap will tie into the existing ground on all edges of the scour hole. All stone will be delivered by barge and bankline stone will be placed by barge. Bedding and surface protection stone may be stockpiled to the north-northwest of the scour hole. Land based equipment will be used to place the bedding and surface protection stone.

b. The project would not impact physical setting of the area; aesthetic resources; recreational resources; socio-economic resources; terrestrial habitat and wildlife; or wildlife refuges, conservation areas, and management areas.

c. There would be no long-term adverse impacts to the physical environment (e.g., noise, air quality, water quality); aquatic habitat and wildlife; or wetlands.

d. The project would benefit commercial and recreational navigation by a providing a safe, reliable, efficient, and sustainable navigation system.

e. The project would not impact agricultural lands. Prime farmland would not be removed from production.

f. The proposed project would not disproportionately affect low income or minority populations; no cultural resource issues, or hazardous and toxic waste issues are expected; and no significant cumulative impacts are anticipated.

g. Federal and/or state listed endangered, threatened, or proposed species will not be adversely impacted.

h. The "No Action" alternative would be unacceptable to recommend as it does not meet the project purpose of providing a safe, reliable, efficient, and sustainable navigation system. It was therefore not investigated in detail.

IV. Compliance with Clean Water Act Section 404, and Rivers and Harbors Act Section 10 is achieved under Nationwide Permit 3 for Maintenance Activities. Compliance with Section 106 of the National Historic Preservation Act (NHPA) will be achieved with the State Historic Preservation Officer's concurrence during public review that this project is not likely to impact any historic sites. The Fish and Wildlife Service will review the document during public review to ensure compliance with the Endangered Species Act and Fish and Wildlife Coordination Act. Compliance with the National Environmental Policy Act will be achieved with the signing of this document. The project is in compliance with all other applicable laws and regulations as documented in Table 4 of the Environmental Assessment.

V. Based on the disclosure of the Tentatively Selected Plan impacts contained within the Environmental Assessment, no significant impacts to the environment are anticipated. The proposed action has been coordinated with the appropriate resource agencies, and there are no significant unresolved issues. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with the Lock and Dam 25 Overflow Dike Scour IRRM Project located in Calhoun County, Illinois, and Lincoln County, Missouri.

_____ _____

Date

Anthony P. Mitchell
Colonel, U.S. Army
District Commander