



DEPARTMENT OF THE ARMY
ST. LOUIS DISTRICT, CORPS OF ENGINEERS
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21 May 2018

Reply to:

U.S. Army Corps of Engineers
St. Louis District
Environmental Compliance Section (PD-C)
1222 Spruce Street
St. Louis, MO 63103-2833

Dear Sir or Madam:

The St. Louis District of the U.S. Army Corps of Engineers has prepared a Draft Environmental Assessment (EA) and unsigned Finding of No Significant Impact (FONSI) for proposed scour repairs at the Jerry F. Costello Lock and Dam, Kaskaskia River, Randolph County, Illinois. The EA and FONSI are available for public review. The electronic version of these documents are available online at: <http://www.mvs.usace.army.mil/Portals/54/docs/pm/Reports/EA/JFCLockandDamScourRepairEA.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. The FONSI is unsigned and will be signed only after comments received as a result of this public review have been considered.

The St. Louis District of the U.S. Army Corps of Engineers is proposing to repair two scour holes upstream of the Jerry F. Costello Lock and Dam. Collectively, the repair of both scour holes would require excavation of approximately 200 yd³ of bed material followed by the placement of approximately 360 tons of riprap, 280 tons of crushed stone bedding, and 670 yd³ of concrete. Bed materials excavated as part of the proposed repairs would be deposited in a designated disposal location south-east of the lock and dam.

Please provide any comments you may have regarding this project. For questions, comments, or to request a printed copy, please contact: Dr. Alison Anderson of the Environmental Compliance Section, **telephone** 314-331-8458 or **e-mail** at Alison.M.Anderson@usace.army.mil. Written comments may be sent to the address above, ATTN: Environmental and Planning Branch (PD-C, Anderson). Please respond by close of business on 20 June 2018.

Sincerely,

A handwritten signature in blue ink that reads "Teri C. Allen".

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

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

**Jerry F. Costello Lock and Dam Upstream Scour Repair
Kaskaskia River, River Mile 0.8
Randolph County, Illinois**



May 2018

**U.S. Army Corps of Engineers
St. Louis District
Regional Planning & Environmental Division North
1222 Spruce Street
St. Louis, Missouri 63103-2833
Telephone Number: (314) 331-8458**

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Environmental Assessment
Jerry F. Costello Lock and Dam Upstream Scour Repair
Kaskaskia River, River Mile 0.8
Randolph County, Illinois
April 2018

1 INTRODUCTION

This Environmental Assessment (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). This EA evaluates the direct, indirect, and cumulative environmental, cultural, and social effects of the proposed scour hole repairs.

The Jerry F. Costello Lock and Dam (L&D; Figure 1), formerly known as the Kaskaskia Lock and Dam, came online in November 1973. The dam consists of two 60-by-30 feet (ft) structural steel non-submersible Tainter gates, reinforced concrete intermediate and abutment piers, sills and stilling basin (forming the spillway), right and left abutments, walkway bridge, storage yard, and earth enclosure dam across the pre-existing channel. The lock portion consists of an 84-by-600 ft lock chamber, gate bays, a culvert type filling and emptying system complete with culvert Tainter valves, upstream and downstream miter gates with bulkhead slots, upper and lower floating guide walls, and a control house. During the construction of the L&D a disposal and containment area (K-O-2; Figure 1) was established along the left descending bank upstream and downstream of the L&D and is referenced in a 1992 Environmental Assessment evaluating the maintenance of the navigation pool at elevation 368.8 ft (USACE, 1992). Containment levees are used to prevent frequent inundation of the disposal area and the redistribution of dredged materials. The dredge disposal containment area is accessible mainly by boat and is managed, in cooperation with the Kaskaskia River Port District, to directly provide for and support the navigation mission of the Corps.

1.1 AUTHORITY

The Kaskaskia Navigation Project was authorized by Congress on 23 October 1962 under The United States Congress River and Harbor Act of 1962. This authorized a single navigation lock, a navigation channel 9 feet deep and 200 feet wide, and straightening of approximately 36 miles of the Kaskaskia River running from Fayetteville, Illinois to the confluence of the Mississippi River.

1.2 PROJECT LOCATION

The Jerry F. Costello Lock and Dam (L&D) is located near the confluence of the Kaskaskia River and the Mississippi River at Kaskaskia River Mile 0.8 in a relocated portion of the river channel in Randolph County, Illinois (Figure 1). The L&D lies near Modoc, Illinois which is approximately 10 miles north of Chester, Illinois. The confluence of the Kaskaskia River and the Upper Mississippi River is located at Mississippi River Mile 117. The Kaskaskia Lock Operations Area lies both upstream and downstream of the L&D on the right descending bank. Lands within this area lie in the floodplain and are inundated on a

routine basis. The western boundary of the Operations Area is formed by a mainline flood risk reduction levee (Prairie DuRocher and Modoc Levee District) while the eastern boundary is approximately at the centerline of the navigation channel. The area is mostly developed land, but contains a small (2-3 acre) bottomland forest at the furthest upstream end.



Figure 1. Location of the Jerry F. Costello Lock and Dam on Kaskaskia River, near Upper Mississippi River Mile 117 and previously established dredge disposal containment area (K-O-2).

1.3 PURPOSE AND NEED

The purpose of the proposed project is to repair two scour holes upstream of the L&D which have formed due to erosional forces. Specifically, the Kaskaskia River thalweg approaches the L&D along the right descending bank, and transitions in the area immediately upstream of the L&D in order to pass through the dam, which is along the left descending bank. The combination of the flow over the upward sloped approach wall with the downward sloped design bed elevation, along with the flow having to make a channel crossing from the right to left descending bank cause the flow to plunge over the approach wall as it aligns to pass through the dam. This submerged plunging flow, along with an undersized top-size for the stone protection has led to increased scour at this location.

An additional scour location was identified near the first floating guide wall pier. This scour location is approximately 325 ft upstream of the dam and has scoured to an elevation of 333.5 ft, which is through the clay blanket and 1 foot into the sand foundation.

Scour surveys have been performed annually to monitor scour both upstream and downstream of the dam. In May 2017, a series of scour surveys were compared to the expected as-built conditions. Overall, the upstream impervious blanket is mostly intact; however an upstream scour hole has grown in its length, width, and depth. In addition, surveys from June 2015 indicate that scour may have exposed foundation sands that lie beneath the 5 ft thick impervious clay blanket, and scour has progressed approximately 1.1 ft in depth since 2015 into the foundation sands. The area of scour and exposed sand is approximately 13 ft by 30 ft and is located 130 ft upstream of the dam along the right approach wall.

This repair is needed given that based on the hydraulic conditions and inadequate scour protection, there is a high likelihood that the size (depth, length, and width) of the scour will increase and potentially migrate closer to the dam structure. A significant scour hole through the clay blanket could cause: 1) the erosion of the compacted pervious fill underneath the clay blanket which could lead to dam undermining and 2) the shortening of the seepage path from upstream to downstream which could increase the chances of backward erosion piping. Continued erosion of the sands could cause dam undermining and backward erosion piping, both of which could lead to structure failure.

2 ALTERNATIVES CONSIDERED

This section of the EA describes the alternatives considered and summarizes the alternatives in terms of their environmental impacts. An Action alternative (Repair Alternative) was developed by identifying construction measures to address the upstream scour. A No Action Alternative is also considered for all areas under consideration.

2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, no repairs to the upstream scour hole would be made. Without action to stabilize the area, scouring would continue to erode the clay blanket and underlying foundation sands. The quantity and rate of erosion is unknown and would be dependent on the hydrology of both the Kaskaskia and Mississippi Rivers. Continued erosion of the sands could cause dam undermining and backward erosion piping, both of which could lead to structure failure.

2.2 REPAIR ALTERNATIVE

Under the Repair Alternative, the upstream scour hole would be excavated, and then a sequence of riprap placed followed by the pouring of concrete to specific elevations (Figure 2). Specifically, the existing stone protection and clay layer within the scour area would be excavated to elevation (EL) 333 ft, approximately 200 cubic-yards of material, and cleaned in order to prepare for concrete placement. Any materials excavated from the scour area would be boated to the eastern bankline and transported along a temporary haul road approximately 0.40 miles long to a 2.7 acre onsite disposal location (i.e., Kaskaskia Dam and Disposal Area K-O-2) to the south-east of the L&D (Figure 3). Depending on water elevations, a second route for disposal is proposed. This route would require a lockage to reach the downstream side of the L&D and then boat transport to the eastern bankline outlined in Figure 3. A maintained gravel haul road, approximately 0.15 miles long, would then be used to transport dredged material to the previously defined disposal area.



Figure 2. Details of the proposed excavation and fill needed to repair scour hole.

Once the area has been cleared of any debris or stone greater than six inches, new riprap would be placed around the perimeter of the scour area and a rebar cage would be installed in the scour hole. Concrete would then be poured to EL 335 ft. Precast concrete blocks would then be placed and anchored followed by an additional concrete pour to EL 337 ft. Additional precast concrete blocks would be placed followed again by a concrete pour to EL 339 ft. Riprap would then be placed upstream of the EL 339 ft pour. Additional concrete would also be poured around the upstream guide wall pier in the second scour area (Pier Scour; Figure 2). The proposed actions outlined above would involve the excavation of

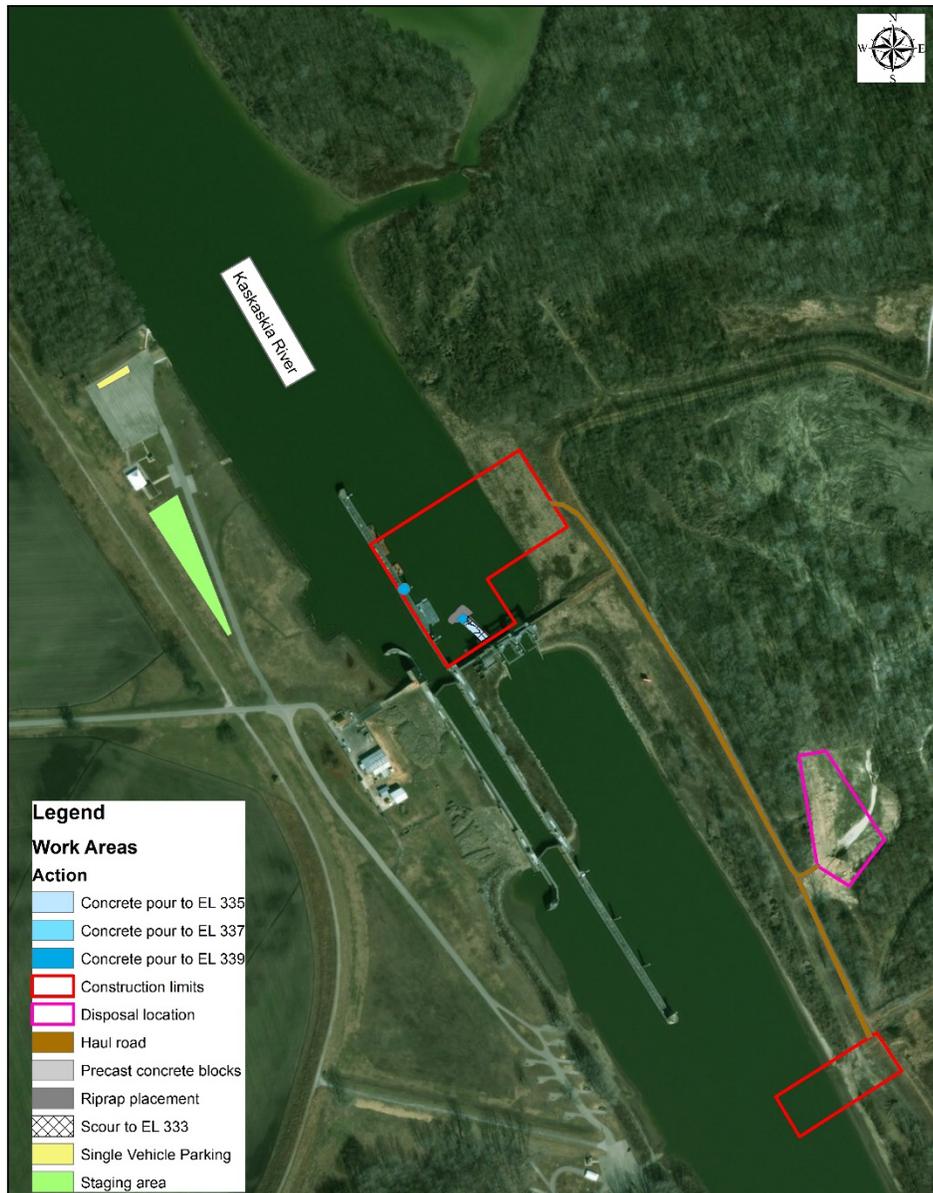


Figure 3. All work areas involved in the proposed plan to repair scour holes.

approximately 0.065 acres, approximately 200 cubic-yards, of bed materials, and the placement of 0.23 acres of fill materials, which includes riprap (360 tons), crushed stone bedding (280 tons), and concrete (670 cubic yards).

In order to perform scour repairs at the proposed scour locations, it would be necessary to close both lock structures and the Tainter gates of the dam. The closure of these structures may be needed to provide the appropriate conditions with minimal river velocities to complete the proposed work. In addition, temporary mooring areas for floating operations would be used to complete the proposed work. Any areas used for staging, storage, or hauling of materials would be returned to their pre-construction conditions. Once mobilized, construction would be expected to take approximately 21 days of 24-hour shifts to complete the proposed work. Based on the hydraulics and the close proximity to the L&D, the repair alternative described was the most effective construction alternative and no other alternatives were considered.

3 AFFECTED ENVIRONMENT

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

3.1 TOPOGRAPHY AND GEOLOGY

The L&D is located on a small peninsula formed by an oxbow type of bend of the Kaskaskia River within the Mississippi flood plains where the plain is approximately 10 miles across. The Illinois bluffs, defining the flood plains on the east, are 1 mile east and 5 miles north of the dam site, and are composed of the Chester series limestone capped by a thick loessial deposit, which resulted from the Wisconsin glacial period. The surface deposits are of Kaskaskia origin, while the lower half of the unconsolidated materials, especially the gravel-boulder zones, are Mississippi River deposits.

3.2 HYDROLOGY AND HYDRAULICS

Flow to the L&D is a combination of local flow from runoff and tributaries and flow released from Carlyle Lake Reservoir at river mile (RM) 94.2. Located at RM 0.8, the L&D experiences a strong influence from the Mississippi River, less than one mile away. It is common for a rising Mississippi River to force open river condition (i.e., Tainter gates fully open) at the L&D due to backwater, even when the L&D is at full pool condition. The project is operated using a hinge point method, with the hinge for the project located at Red Bud, Illinois, at RM 18.6. The pool is regulated within the limits of 363.0 and 368.8 feet-NGVD29 (plus or minus 0.2 foot) at the dam while maintaining 368.0 feet-NGVD29 or higher at Red Bud. This is tentatively accomplished by drawing the pool at the dam down one foot for each 1,000 cfs in excess of 5,000 cfs of pool inflow, thus reaching minimum pool at 10,000 cfs. Refilling is accomplished in reverse order.

3.3 WATER QUALITY

The Kaskaskia River is a 325 miles long tributary of the Mississippi River. The Kaskaskia River drains approximately 5,746 mi² of Illinois and is impounded in two locations resulting in the formation of two reservoirs: Lake Shelbyville in Shelby County and Carlyle Lake in Clinton County. The Jerry F. Costello Lock and Dam is the only lock and dam structure on the Kaskaskia River. Approximately 36 miles of the

Kaskaskia River running from Fayetteville, Illinois, to the confluence of the Mississippi River, at Mississippi River Mile 117, was straightened to accommodate increased navigation.

The proposed project area is within the Lower Kaskaskia HUC12 watershed. Illinois Environmental Protection Agency (IEPA) samples surface waters within HUC12 watersheds on a 4-year rotation to meet Section 305(b) of the Clean Water Act (1976). Illinois EPA reports the resource quality of its waters in terms of the degree to which the beneficial uses of those waters are supported and the reasons (i.e., causes and sources) beneficial uses may not be supported.

According to the IEPA (2016), impaired uses and causes for impairment (within parentheses) for the Kaskaskia River include: fish consumption (mercury); aquatic life (iron, total phosphorus, sedimentation, water temperature, total suspended solids); and public and food processing water supplies (iron).

3.4 RECREATION AND AESTHETICS

The area surrounding the Jerry F. Costello L&D offer opportunities for wildlife observation, fishing, boating, camping, picnicking, and hiking. There is a boat ramp and parking lot upstream of the Jerry F. Costello L&D that can hold approximately 20 vehicles with boat trailers in addition to single vehicle parking. There is an additional boat ramp that allows access to the Kaskaskia River downstream of the L&D. At this location, there are a few trailer accessible parking spots along with approximately 15 camping locations. Recreational use of these facilities tends to be higher in the summer months, and is lighter in the winter months.

The L&D is located in the Kaskaskia River in a rural area of Illinois. The L&D structures, which are man-made, can be viewed by some as aesthetically pleasing, however it can detract from the nature-experience visitors might expect from the area. Overall, the area surrounding the L&D is a mix of agricultural, development, and nature. To the west of the L&D lies the Prairie Du Pont Levee which protects row crop and agricultural structures. Even though the area has been heavily altered by the construction of the L&D, its position on the Kaskaskia River, and in close proximity to the Mississippi River, provides a natural setting that is commonly enjoyed by visitors.

3.5 VEGETATION AND WETLANDS

The land areas adjacent to the Kaskaskia River are comprised of extensive mixed bottomland forests, which consist of pecan, soft maple, bur oak, pin oak, shellbark, and willow, many cultivated and fallow fields, mature bottomland hardwoods, oxbow lakes, and emergent and forested wetlands (Figure 4; USFWS, 2017). The State of Illinois owns approximately 17,000 acres of land adjacent to the navigation pool and therefore has complete control over the use, management, and development of these lands. The majority of these lands make up the Kaskaskia State Fish and Wildlife Management area and are under the management of the Illinois Department of Natural Resources.

The Kaskaskia River Navigation Project, in conjunction with other agencies, have developed vegetation management areas near the L&D. A vegetation management area has been established at the west side of the confluence of the Kaskaskia River and the Mississippi River. The lands within this area lie low in the floodplain and are subject to frequent inundation. This area is heavily forested with the primary species being cottonwood, ash, and maple. The area also contains approximately 3 acres of abandoned agricultural fields, which are returning to forested bottomland through natural succession.

An additional vegetation management area is located immediately upstream of the L&D at Kaskaskia River Mile 1.0 on the left descending bank. The lands within this area are within the floodplain and are subject to frequent inundation. The area is heavily forested with willow, cottonwood, and maple trees. The area also contains approximately 10 acres of abandoned agricultural fields which is becoming reforested through natural succession. This is also intermingled with sloughs and portions of remnant river channels, which have been exaggerated by the raising of the navigation pool and have resulted in increased wet and semi-emergent habitat.

Frequent flooding of the lands adjacent to the L&D facilities has led to the establishment of non-native grasses that require a significant amount of labor to maintain an aesthetically pleasing condition. Parts of these areas are actively being converted to native flood tolerant grasses and forbes. The area is mostly developed land, but contains a small (2-3 acre) bottomland forest at the furthest upstream end.

During construction and later maintenance of the Kaskaskia navigation channel, the Corps cleared or filled 2,000-3,000 acres of bottomland forest and wetlands for the placement of excavated and dredged materials. Most of these disposal areas survive today as old field habitats; however, a few low areas within disposal sites contain permanent or temporary standing water and function as low to moderate quality wetlands. The large scale deposition of dredged material has also altered the flood regime in many places in the surrounding floodplain. Partial isolation of areas from the river system by disposal areas has made some areas drier due to less flooding and others wetter because of poorer drainage. The dredge disposal containment area (K-O-2) is still maintained on a routine basis. At a minimum, heavy equipment is brought into the containment area every 4 years in order to remove woody growth, which reduces capacity and otherwise limits the usefulness of the containment area as wetland habitat.

3.6 AQUATIC HABITATS

The river engineering and construction and operations of the Jerry F. Costello L&D have severely altered the aquatic ecosystem in the Kaskaskia River. The Kaskaskia River Navigation Project, which included the construction of the L&D, straightened approximately 36 miles of the river which cut-off approximately 26 river bends to increase efficiencies in hauling materials via barge. These river bends, now oxbow lakes and disconnected side channels, provide important habitats for fish and wildlife. Many of these oxbow lakes and disconnected side channels are actively managed for waterfowl.

The installation of the L&D and construction of Carlyle and Shelbyville Lakes, makes the Kaskaskia River a highly regulated river system in which base flow periods are periodically disrupted by pulsing flows resulting from flood-control operations. The complications due to the fluctuating flow regime have the potential to alter the ecological integrity of a watershed ecosystem through the disruption of natural river flows, channel fragmentation, and hindering species' reproduction.

The aquatic areas downstream of the L&D experience a strong influence from the Mississippi River, which is less than one mile away. It is common for a rising Mississippi to force open river condition at the L&D due to backwater, even when the lock and dam is at full pool condition. During high water events, the adjacent bottomland hardwoods and oxbow lakes function as natural floodplain habitats which provide refuge for aquatic organisms, distribute nutrients, and trap sediments.

The aquatic areas upstream of the L&D experience some influence from the Mississippi River during high water events. However, the reaches above the L&D are more lake-like. The reduced flow velocity

upstream of the L&D leads to increased sedimentation near the dam structure and increased erosion along the banklines.

3.7 FISH AND WILDLIFE

At the Kaskaskia Navigation Project, the U.S. Army Corps of Engineers in cooperation with the Illinois Department of Natural Resources, have developed stocking and habitat improvement programs to increase fish populations and species diversity within the Kaskaskia River. There are year-round fishing opportunities on the Kaskaskia River including white bass, bluegill, crappie, channel catfish, largemouth bass, freshwater drum, common carp, flathead catfish, and sauger. Sturgeon species, including the federally endangered pallid sturgeon, have been observed immediately below the L&D and at the confluence of the Kaskaskia and Mississippi Rivers.

As part of the wildlife management program, food plots of sunflowers, corn, millet, clover, *Brassica sp.*, and wheat are planted each spring at several locations along the Kaskaskia River for birds (e.g., turkey and quail) and mammals (e.g., whitetail deer and rabbits). There are more than 450 acres of public lands open to hunting and subject to state regulations. Wildlife management areas can be found along the river. The Kaskaskia River is bordered by many oxbow lakes and sub-impoundments. The close proximity to the Mississippi River corridor makes the proposed project area, and surrounding landscapes, an important mid-migration resting area for waterfowl and other migratory birds. The combination of diverse and abundant fish populations and important migratory bird habitats make this area suitable for bird watchers and other outdoor enthusiasts. However, the immediate project area provides little habitat for aquatic species due to the operations of the L&D and frequent commercial barge traffic.

3.8 THREATENED AND ENDANGERED SPECIES

3.8.1 State Listed Species

In accordance with the General Conditions outlined in the Nationwide Permit No. 3 Clean Water Act Water Quality Certification from the State of Illinois, the proposed project should take into consideration impacts to state listed threatened and endangered species.

The Illinois Department of Natural Resource (IDNR) was contacted via the Ecological Compliance Assessment Tool (EcoCAT) website on 02 April 2018, for a list of Illinois State threatened and endangered species that could potentially be located in the project areas (IDNR project number: 1809498; Attachment 1). The Illinois Natural Heritage Database shows that one species, Mississippi Kite (*Ictinia mississippiensis*), may be in the vicinity of the proposed project location.

The Mississippi Kite's breeding range extends widely across the southern states, from the Carolinas to Texas and Oklahoma, in parts of Kansas and Arizona, and northward through the central Mississippi River Valley. The Kite nests in tall trees such as cottonwoods, which are often found in mature bottomland forests close to water. Single individuals or pairs can be seen rather commonly at nesting sites along the Mississippi River from Cairo, IL, to St. Louis, MO, from May through August. In 1999, one reliable nesting site was at the Fort Kaskaskia State Park, and the largest nesting population in Illinois is along the levee road on the Union County Conservation Area. This species' numbers were thought to be declining due to habitat destruction (IOS, 1999). In 2009, this species' state listed status was changed

from endangered to threatened due to its expanding range and its increasing population size within Illinois (IOS, 2009).

3.8.2 Federally Listed Species

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973 (as amended), federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species.

The U.S. Fish and Wildlife Service (USFWS) was contacted via USFWS Information for Planning and Consultation (IPaC) website on 29 March 2018, for a list of Federal threatened, endangered and candidate species (Attachment 2) that could potentially be located in the project areas (Consultation Code: 03E18100-2018-SLI-0340 and Event Code: 03E18100-2018-E-00788).

Table 1. List of federally listed threatened and endangered species potentially occurring within the proposed project area.

Common Name	Scientific Name	Listing Status	Habitat
Indiana Bat	<i>Myotis sodalis</i>	Endangered	Caves and mines (hibernacula); small stream corridors with well-developed riparian woods, upland forests (foraging)
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	Threatened	Caves and mines (hibernacula); small stream corridors with well-developed riparian woods, upland forests (foraging)
Pallid Sturgeon	<i>Scaphirhynchus albus</i>	Endangered	Mississippi River downstream of its confluence with the Missouri River; Ohio River below Dam #53; Missouri River
Interior Least Tern	<i>Sterna antillarum</i>	Endangered	Sparsely vegetated sand and gravel bars on large rivers (nesting)
Small Whorled Pogonia	<i>Isotria medeoloides</i>	Threatened	Old hardwood habitats with acidic soils

Indiana Bat. Indiana Bats hibernate in caves, or mines, only during the winter months. In Missouri, hibernation season is from 1 October to 31 March. During the active season (1 April to 30 September), they roost in forest and woodland habitats. A wide variety of summer habitats are suitable for Indiana Bats such as forested/wooded habitat and non-forested habitats such as emergent wetlands, adjacent edges of agricultural fields, old fields, and pastures. Roosting habitats for this species include live and/or snags at least 5 inches diameter at breast height (DBH) and have exfoliating bark, cracks, crevices, and/or hollows. Tree species used as roosts often include, but are not limited to, shagbark hickory, white oak, cottonwood, and maple trees.

Northern Long-eared Bat. Northern Long-eared Bats hibernate in caves, or mines, only during the winter months. In Missouri, hibernation season is from 1 October to 31 March. During the active season (1 April to 30 September), they roost in forest and woodland habitats. A wide variety of summer habitats are suitable for Northern Long-eared Bats such as forested/wooded habitat and non-forested habitats such as emergent wetlands, adjacent edges of agricultural fields, old fields, and pastures. Roosting habitats for

this species include live and/or snags at least 3 inches DBH and have exfoliating bark, cracks, crevices, and/or hollows. Tree species used as roosts often include, but are not limited to, shagbark hickory, white oak, cottonwood, and maple trees. Northern Long-eared Bats have also been observed roosting in human-made structures such as buildings, barns, bridges, and bat houses.

Pallid Sturgeon. This fish is found in the Mississippi River downstream of its confluence with the Missouri River, which is about 4 miles downriver of the Melvin Price Locks and Dam. The entire stretch of river below the mouth of the Missouri River is considered potential habitat. Pallid sturgeon are most frequently caught over a sand bottom, which is the predominant bottom substrate within the species' range on the Missouri and Mississippi Rivers. Pallid sturgeons have been found in water 1.2 to 7.6 meters deep with velocities of 0.33 to 90 centimeters per second (USFWS, 1993). These data probably better reflect where data have been collected rather than actual habitat preferences. The Fish and Wildlife Service-Carterville Office caught 6 pallid sturgeon at the mouth of the Kaskaskia River during the 2013 – 2016 pallid sturgeon population sampling.

Interior Least Tern. Nesting colonies of the least tern have been recorded in southern Illinois from Jackson and Alexander Counties (Herkert, 1992). The least tern has occasionally been observed in the St. Louis Metro-East area at Horseshoe Lake during spring migration. No known natural nesting habitat of the least tern occurs within the study area or adjacent reach of the Mississippi River. This bird forages for small fish in shallow water areas along the river and in backwater areas, such as side channels and sloughs. Foraging and nesting habitat are located in close proximity to each other. From late April to August, least terns nest on sparsely vegetated alluvial or dredge spoil islands and sand/gravel bars in or adjacent to rivers, lakes, gravel pits and cooling ponds. They nest in colonies with conspecifics and sometimes with the piping plover (*Charadrius melodus*). Nesting locations usually are at the higher elevations and away from the water's edge. Dams, reservoirs, and other changes to river systems have eliminated most historic least tern habitat. Narrow forested river corridors have replaced historical wide channels dotted with sandbars that are preferred by the terns. Furthermore, recreational activities on rivers and sandbars disturb the nesting terns, causing them to abandon their nests.

Small Whorled Pogonia. The small whorled pogonia is a member of the orchid family that grows to about 10 – 14 inches tall with a whorl of five to six leaves towards the top and beneath the flower. Although this flower is widely distributed it is rather rare with less than 20 plants per population. This orchid grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory with sandstone and acidic soils. The primary threat to the small whorled pogonia is the destruction of their habitat due to urban development, forestry practices, and trampling during recreational activities (USFWS, 1992). A single colony site was discovered in 1973 in Randolph County, Illinois, on land owned by The Nature Conservancy. However, in 1991, only one plant was observed.

3.9 BALD AND GOLDEN EAGLE

Bald Eagles (*Haliaeetus leucocephalus*) winter along the major rivers of Illinois and Missouri, and at scattered locations some remain throughout the year to breed. Perching and feeding occurs along the edge of open water, from which eagles obtain fish. The bald eagle was removed from the List of Endangered and Threatened Species in August 2007, but it continues to be protected under the Bald and Golden Eagle Protection Act and by the Migratory Bird Treaty Act. Recommendations to minimize potential project impacts to the bird and nests are provided by the U.S. Fish and Wildlife Service in the agency's National

Bald Eagle Management Guidelines publication (USFWS, 2010). The guidelines recommend: (1) maintaining a specified distance between the activity and the nest (buffer area); (2) maintaining natural areas (preferably forested) between the activity and nest trees (landscape buffers); and (3) avoiding certain activities during the breeding season. Specifically, construction activity is prohibited within 660 feet of an active nest during the nesting season, which in the Midwest is generally from late January through late July. An active bald eagle nest is located approximately 1.5 miles north of the Jerry F. Costello L&D.

3.10 CULTURAL AND TRIBAL RESOURCES

Cultural resources are locations of past human activity, occupation or use and typically include archaeological sites such as prehistoric lithic scatters, villages, procurement area, rock art, shell middens; and historic era sites such as refuse scatters, homesteads, railroads, ranches, logging camps, and any structures or buildings that are over 50 years old. Cultural resources also include Traditional Cultural Properties (TCPs), which are aspects of the landscape that are part of traditional lifeways and practices and are considered important to a community. The National Historic Preservation Act (NHPA) is the major piece of federal legislation that mandates that federal agencies consider how undertakings could affect significant cultural resources.

In addition to the consultation with IL State Historic Preservation Office (SHPO), consultation with Native American Tribal organizations would also be required to ensure compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. The USACE St. Louis District has previously established consultation agreements with 26 Tribal organizations that have ties to, or an interest in, the District's region.

The proposed project area falls within an area rich in cultural resources ranging from archaeological sites and TCP's to early historic sites associated with the region's early importance as a transportation corridor. The lower Kaskaskia River has undergone significant planform and course changes since the 19th century. The construction of the lock and dam between 1967 and 1973 involved extensive earthmoving and channelization of the river. It is highly unlikely there are any intact cultural deposits, either submerged or terrestrial, in the immediate vicinity of the structures.

3.11 SOCIOECONOMICS AND TRANSPORTATION

Traffic on the river varies from barge traffic carrying grain, slag, coiled steel, farming chemicals, and other goods, to small recreational pleasure craft. There are two marinas, one at Evansville (Kaskaskia RM 10) and one at New Athens (Kaskaskia RM 28.5), along with several boat ramps between Carlyle Lake and the Kaskaskia-Mississippi River confluence. The Kaskaskia River channel is navigable up to New Athens, IL (Kaskaskia River Mile 28), with Congressional authorization to periodically dredge the straightened navigation channel to Fayetteville, IL (Kaskaskia RM 35.6). Small recreational watercraft are able to continue upstream. The only commercial traffic in the area is through the lock structure at the L&D. The maximum number of lockages between 1973 and 2009 occurred in 2003 with a total of 4,500 (Figure 5).

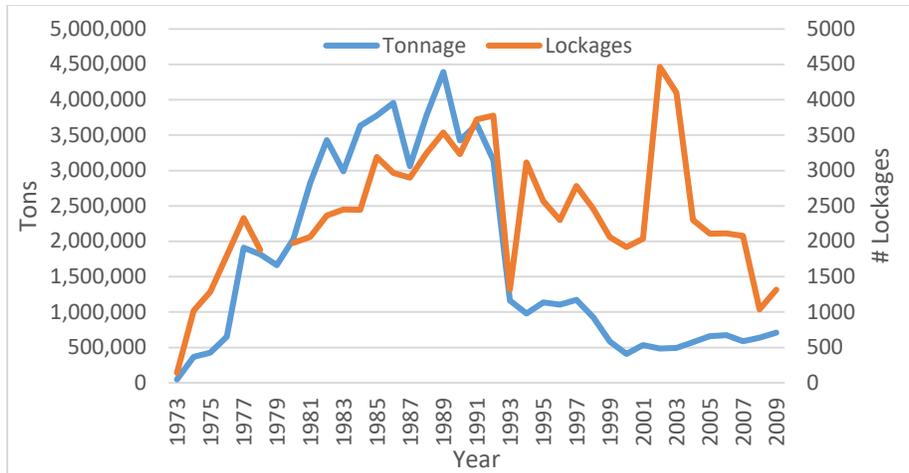


Figure 4. Total number of lockages and tons of materials transported through the Jerry F. Costello L&D between 1973 and 2009.

3.12 HAZARDOUS, TOXIC, AND RADIOACTIVE MATERIALS

Corps regulations (ER 1165-2-132 and ER 200-2-3) and District policy require procedures be established to facilitate early identification and appropriate consideration of potential hazardous, toxic, or radioactive waste (HTRW) in reconnaissance, feasibility, preconstruction engineering and design, land acquisition, construction, operations and maintenance, repairs, replacement, and rehabilitation phases of water resources studies or projects by conducting Environmental Condition of Property (ECP) Assessments. Upon reviewing the proposed project, it was determined that there are no current HTRW concerns within the proposed project area.

3.13 AIR QUALITY AND NOISE

The Clean Air Act of 1963 requires the U.S. Environmental Protection Agency (EPA) to designate National Ambient Air Quality Standards (NAAQS). The EPA has identified standards for 6 pollutants: lead, sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, particulate matter (less than 10 microns and less than 2.5 microns in diameter), along with some heavy metals, nitrates, sulfates, volatile organic and toxic compounds (Table 2). This region of Randolph County, IL, is currently in attainment for all EPA air quality standards (USEPA, 2018).

Table 2. Six pollutants and their standard criteria designated by the U.S. EPA.

Pollutant	Averaging time	Criteria	Form
Carbon monoxide	8 hours	9 ppm	Not to be exceeded more than once per year
	1 hour	35 ppm	
Lead	Rolling 3 month	0.15 µg/m ³	Not to be exceeded
Nitrogen dioxide	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	1 year	53 ppb	Annual Mean
Ozone	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years

Particle Pollution (PM_{2.5})	1 year	12.0 µg/m ³	Annual mean, averaged over 3 years
	24 hours	35 µg/m ³	98th percentile, averaged over 3 years
Sulfur dioxide	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years

L&D related noises can consist of recreational boat motors, vehicle traffic, day use visitors, maintenance equipment (e.g., lawn mowers), towboat motors, and water flowing through dam. In addition, air horn signals are routinely used during lock operations. Due to a variety of activities at the L&D, noise levels can range widely. For example, a typical car can produce 60 – 90 decibels (dB) at a distance of 50 feet, while a pleasure boat may produce noise levels ranging from 65 – 115 dB (USEPA, 1974). Noise from lawnmowers and chainsaws range from 90 – 100 dB (Figure 5).

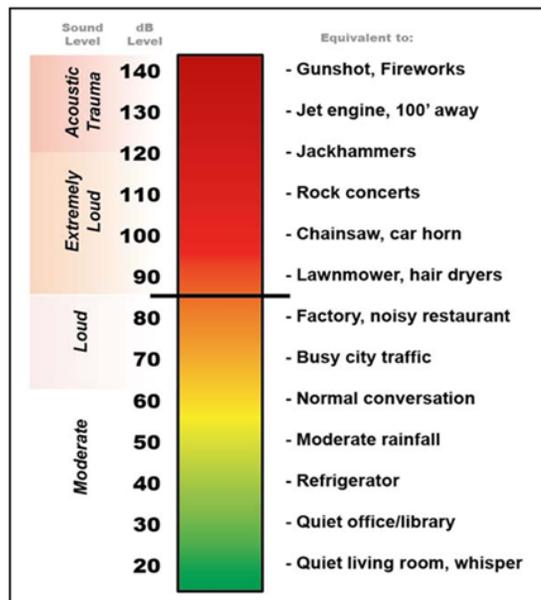


Figure 5. Sound and decibel (dB) levels of a variety of sources that may occur at the Jerry F. Costello L&D.

4 ENVIRONMENTAL CONSEQUENCES

The discussion of impacts (environmental consequences) detail those resources that could be impacted, directly or indirectly, by the no action alternative and the proposed action. Direct impacts are those that would take place at the same time and place (40 CFR §1508.8(a)) as the action under consideration. Indirect impacts are those that are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable (40 CFR §1508.8(b)).

The discussion of cumulative impacts considers the effects on the resource that result from the incremental impact of the action being considered when added to other past, present, and reasonably foreseeable future actions regardless of what agency, Federal or non-Federal, or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taken place over a period of time (40 CFR §1508.7).

4.1 TOPOGRAPHY AND GEOLOGY

4.1.1 No Action Alternative

With the No Action Alternative, the topography and geology of the proposed project area would remain the same as the existing conditions. Scour in the identified areas would continue which would increase the risk of dam undermining and backward erosion piping. The disposal of dredge material in designated disposal containment areas would continue and may increase the elevation in these areas.

4.1.2 Repair Alternative

No substantial impacts to topography or changes in geology are expected under the proposed alternative. The proposed project area would remain consistent with the existing conditions. The disposal of dredge material in designated disposal containment areas may increase the elevation in these areas.

4.2 HYDROLOGY AND HYDRAULICS

4.2.1 No Action Alternative

With the No Action Alternative, hydrology and hydraulics of the proposed project area would remain the same as the existing conditions. Scour in the identified areas would continue, which would increase the risk of dam undermining and backward erosion piping.

4.2.2 Repair Alternative

The placement of rip-rap and the pouring of concrete below the Ordinary High Water (OHW) elevation would bury some of the existing riverbed substrate. Timing of construction would coincide within low flow conditions in order to minimize modifications to dam operations. However, both lock structures and the Tainter gates would be closed during construction to reduce river velocities in the proposed project area. These dam operation modifications would be temporary and standard operations would continue following the completion of the proposed work. The effects on hydrology and hydraulics would be minimal because the proposed action would not result in alterations to the overall flow regime.

4.3 WATER QUALITY

4.3.1 No Action Alternative

With the No Action Alternative, water quality at the project area would remain the same as the existing condition since no construction would occur.

4.3.2 Repair Alternative

There may be minor localized and short-term negative impacts from increases in turbidity caused by the proposed excavation of existing scour area and by the placement of rock and concrete. Stabilization of the scour area would reduce erosion which may improve water quality conditions resulting from turbidity and suspended sediments over the long-term. The construction of the proposed project is estimated to be approximately three weeks in duration. Following completion of the proposed project, no impacts to water quality are anticipated. Due to the temporary nature of the action, impacts to water quality would be less than significant.

4.4 RECREATION AND AESTHETICS

4.4.1 No Action Alternative

Recreation opportunities and aesthetics of the area surrounding the L&D would remain consistent with the existing conditions. Banklines adjacent to the proposed work area would continue to be maintained (i.e., mowed) and the proposed disposal location would continue to be used as a repetitive dredge disposal location. Both boat ramps and the campground in the proposed project area would remain open to the public. Continued undermining of the dam structure could lead to failure of the dam and reduction in water surface elevation. A reduction in the surface elevation would expose unvegetated banklines and further disconnect side channels, which would reduce both recreation opportunities and the aesthetics of the region.

4.4.2 Repair Alternative

There may be minor and short-term negative impacts due to construction staging. Specific single vehicle parking locations at the upstream boat ramp would be available for use for construction personnel parking. The construction of the proposed project is estimated to be approximately two weeks in duration. Following completion of the proposed project, no impacts to boater recreation opportunities are anticipated. Due to the temporary nature of the action, impacts to boat recreation access would be less than significant.

Boating and fishing is prohibited near the dam, where the scour hole is located. Therefore, the construction of the project would have no impacts to fishing opportunities on the Kaskaskia River. Project alternatives would have no effects on campground operations or use of the downstream boat ramp. In addition construction is proposed to occur during low flow periods which may coincide with less recreation in the project area.

Some people may find construction related activities and rock and concrete to be aesthetically unpleasing. However, the rock and concrete would only be placed below the water surface so aesthetics of the area would not be impacted after construction is complete.

4.5 VEGETATION AND WETLANDS

4.5.1 No Action Alternative

Conditions of vegetation in the area surrounding the L&D would remain consistent with the existing conditions. Banklines adjacent to the proposed work area would continue to be maintained (i.e., mowed) and the pre-existing disposal containment area would continue to be used as a repetitive dredge disposal location as part of Kaskaskia and Mississippi Rivers 9-ft Navigation Channel projects. The dredge disposal containment area is routinely cleared of all vegetation and therefore provides little to no habitat for wetland species. However, the disposal area can be inundated with water during flood events.

4.5.2 Repair Alternative

Any vegetation, mostly tuff grass, along the adjacent bankline to the proposed project area would be disturbed during the transport of excavated materials and for construction staging. Any disturbed areas of vegetation would be reseeded once construction was complete. Approximately 0.23 acres of river bed would be covered by riprap and other fill materials to repair the scour holes. The area to be covered by riprap was highly altered during L&D construction and provides little natural habitat for aquatic

organisms. The bank-edge of the construction limits and the haul roads are within areas that are highly disturbed and have no trees remaining and are routinely maintained per the Kaskaskia River Master Plan (Figure 6). The disposal containment area was established during the construction of the L&D and is currently routinely cleared of all vegetation and is used as a repetitive dredge disposal area and provides little to no habitat for wetland species. However, the disposal area would be inundated with water during flood events. Due to the existing degraded conditions and continual disturbances of the disposal containment area, no viable wetlands or bottomland hardwoods currently exist in the proposed project area, and thus no mitigation would be required as part of the proposed actions. Bankline off-loading of the excavated materials would temporarily disturb the vegetation, which is primarily grasses. These areas would be re-seeded following construction so impacts would be temporary. Haul roads identified in the proposed actions are frequently used to access the disposal area. The downstream haul road is a gravel roadway and is frequently maintained.

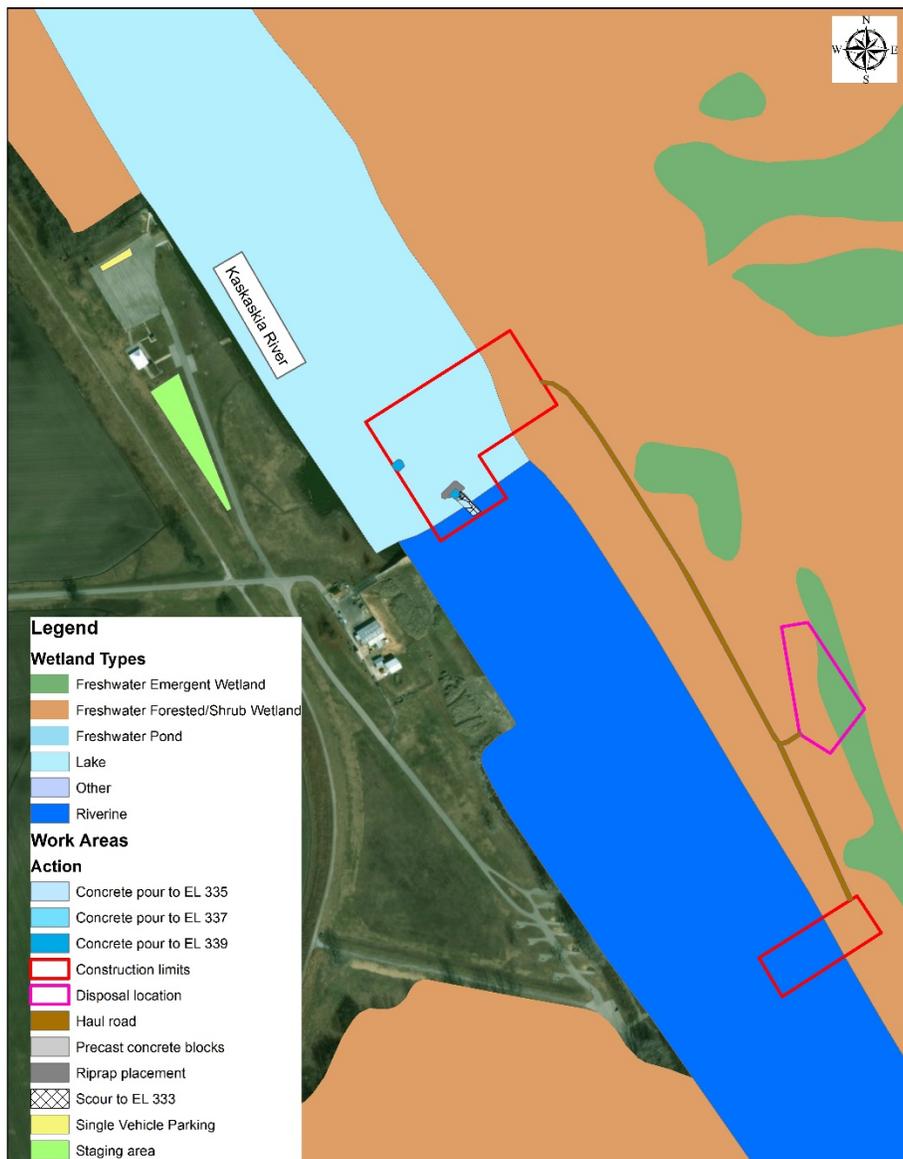


Figure 6. National Wetland Inventory of the proposed project area and the immediate vicinity. Due to the existing degraded conditions and continual disturbances of the disposal containment area, no viable wetlands or bottomland hardwoods currently exist in the proposed project area.

4.6 AQUATIC HABITATS

4.6.1 No Action Alternative

With the No Action Alternative, aquatic habitat within the proposed project vicinity would remain consistent with the existing conditions. The scour area would continue to erode the river bed, which may increase water turbidity. Continued dam undermining may lead to dam failure and a reduction in water surface elevation. Reduced water elevation may further disconnect aquatic organism access to side channel habitats. Unless the L&D were completely removed, there would be no increase in river connectivity to the Upper Mississippi River.

4.6.2 Repair Alternative

Under the Repair Alternative, riprap would permanently cover approximately 0.23 acre of the river bottom at the scour areas. The proposed repair areas are within 500 ft of the dam structure and provide little habitat for aquatic organisms due to variable and high velocity flows through the Tainter gates and lack of substrate diversity.

4.7 FISH AND WILDLIFE

4.7.1 No Action Alternative

Minimal long term negative impacts concerning fish and wildlife would occur as a result of taking no action to address the scour hole. Continued scour would allow continued sediment redistribution in the river. The immediate vicinity of the scour hole provides little to no habitat for fish due to the high flows and river alterations due to dam construction and operations. Noise from commercial barge traffic would continue in the proposed project area. The proposed excavation disposal area would continue to be used as a repetitive dredge disposal area. Wildlife management areas along the Kaskaskia River would continue to maintain habitats for mammals, migratory birds, and waterfowl.

4.7.2 Repair Alternative

L&D operations limit suitable habitats for fish species due to altered hydrology and prevention of fish passage. The placement of rip-rap and the pouring of concrete below the Ordinary High Water (OHW) would bury some of the existing riverbed substrate and associated benthic macroinvertebrate habitats. Most of the impacts under the Repair Alternative would be short-term and construction-related. Construction-related noise and localized turbidity may affect fish in the proposed project area. However, these impacts would be temporary and would not occur once construction was complete. There would be temporary noise-related disturbances to any mammals and birds in the area. Effects to roosting habitat would be limited, since tree removal is not expected in the immediate project vicinity. Wildlife management areas along the Kaskaskia River would continue to maintain habitats for mammals, migratory birds, and waterfowl.

4.8 THREATENED AND ENDANGERED SPECIES

4.8.1 State Listed Species

The USACE St. Louis District Regulatory Branch is in the process of authorizing the activities using existing Department of the Army Nationwide Permit (NWP) No. 3 (Maintenance Activities). In accordance with the General Conditions outlined in the Nationwide Permit No. 3 Clean Water Act Water Quality Certification from the State of Illinois, the proposed project should take into consideration impacts to state listed threatened and endangered species.

4.8.1.1 No Action Alternative

No impact concerning threatened and endangered species would occur as a result of taking no action to address the ongoing scour in the Kaskaskia River at the Jerry F. Costello Lock and Dam.

4.8.1.2 Repair Alternative

Short-term construction related disturbance may occur. During construction vibrational and noise related disturbance may occur. However, these disturbances would be temporary and would no longer occur once the scour hole was repaired. In addition, the increased noise levels could be compared to a slight increase in barge traffic, which commonly occurs at the Jerry F. Costello L&D. Construction is anticipated to take place during low flow periods, which typically occur during August and September. This time period corresponds to the migration of the Mississippi Kite from the U.S. to the subtropical portions of South America. Impacts to the species would be negligible since construction is expected to occur as individuals are leaving the U.S. as part of their fall migration.

4.8.2 Federally Listed Species (Biological Assessment)

In accordance with Section 7(a)(2) of the Endangered Species Act (ESA) of 1973 (as amended), federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species.

4.8.2.1 No Action Alternative

No impact concerning threatened and endangered species would occur as a result of taking no action to address the ongoing scour at the Jerry F. Costello Lock and Dam.

4.8.2.2 Repair Alternative

Indiana Bat. No tree clearing activity would take place as part of the proposed scour hole repair. Therefore, the St. Louis District has determined that the proposed action would have “*no effect*” on the Indiana Bat.

Northern Long-eared Bat. No tree clearing activity would take place as part of the proposed scour hole repair. Therefore, the St. Louis District has determined that the proposed action would have “*no effect*” on the Northern Long-eared Bat.

Pallid Sturgeon. This fish is found in the Mississippi River downstream of its confluence with the Missouri River and has been caught at the mouth of the Kaskaskia River. The entire stretch of Mississippi River below the mouth of the Missouri River is considered potential habitat. Construction for this proposed project is confined to the floodplain and an inhospitable area near the Tainter gates of the dam in the Kaskaskia River. Therefore, the St. Louis District has determined that the proposed action would have “*no effect*” on the Pallid Sturgeon.

Interior Least Tern. The proposed action would not affect any known Least Tern nesting habitat, any habitats along the Mississippi River, or any sand or gravel bars within or adjacent to water bodies. Therefore, the St. Louis District has determined that the proposed action would have “*no effect*” on the Least Tern.

Small Whorled Pogonia. Individuals on this species have historically been located within Randolph County, Illinois historically. The proposed project areas within the floodplain have been routinely cleared of vegetation making these area unsuitable for this species. Due to the lack of older hardwood tree stands that have an open understory in the proposed project area, the St. Louis District has determined that the proposed action would have “*no effect*” on the Small Whorled Pogonia.

4.9 BALD AND GOLDEN EAGLE

4.9.1 No Action Alternative

No impact concerning bald or golden eagles would occur as a result of taking no action to address the ongoing scour at the Jerry F. Costello Lock and Dam.

4.9.2 Repair Alternative

No bald eagle nests are known to occur in the proposed work areas. The nearest known nest is located approximately 1.5 miles upstream of the L&D near Kaskaskia River Mile 2.4. No impacts to bald eagles or their nests are anticipated.

4.10 CULTURAL AND TRIBAL RESOURCES

4.10.1 No Action Alternative

With the No Action Alternative, adverse effects to known historic and cultural resources within the Kaskaskia River are not anticipated.

4.10.2 Repair Alternative

Excavation of the scour and the placement of rock/concrete is highly unlikely to affect any submerged cultural resources. This conclusion is based upon the fact that the river bed has been heavily disturbed during the construction and operations and maintenance of the L&D. Any material excavated would be removed via boat to an existing road and transported to an existing disposal area. This disposal area has previously been used for river material and no additional excavation is involved in its placement. Adverse effects to historic and cultural resources are not anticipated. A letter requesting concurrence with the determination of no adverse impacts was sent to the Illinois State Historic Preservation Office (IL SHPO) on 30 March, 2018. In addition, letters describing the proposed actions were sent, on 4 April 2018, to 26 Tribal organizations that have ties to, or an interest in, the St. Louis District’s region.

4.11 SOCIOECONOMICS AND TRANSPORTATION

4.11.1 No Action Alternative

With the No Action Alternative, socioeconomics and transportation within the proposed project area would remain consistent with the existing conditions. Scour in the identified areas would continue which would increase the risk of dam undermining and backward erosion piping. These risks could impact dam operations potentially reducing, or eliminating, navigation capabilities upstream of the L&D. Decreases in

navigation capabilities has the potential to negatively impact socioeconomic and transportation of commodities in the region.

4.11.2 Repair Alternative

The proposed project would require the use of existing parking spaces at the northern boat ramp. Expected impacts to traffic in the L&D area would likely be an increase in truck traffic for hauling rock and a temporary reduction in available public parking spaces. The rock for the proposed project would be hauled from a commercial facility where truck traffic is a normal occurrence and rock hauling activities would not likely cause additional impacts to traffic conditions in that area. Rock would be delivered to a location at the L&D and then would be loaded on a barge and transported a short distance to the scour repair area. Materials excavated from the river bed would be transported a short distance to the east bankline via barge and then offloaded. The disposal material would then be trucked on pre-existing haul roads to the disposal area (Figure 3) and would have no impact on current transportation patterns or infrastructure.

In order to perform the proposed scour hole repairs, the lock and dam structure will need to remain closed for approximately 21 days. The closure of the lock structure would be coordinated with lock operations to minimize the impacts to barge transportation and the local economics of the region. Coordination with the coal-fired power plant upstream of the L&D has been conducted and an alternative pathway of coal transportation, which incorporates the use of trucks, has been established in the event that additional materials are needed during the 21-day closure. There is potential for intermittent lock usage, depending on construction status, in order to help prevent disruptions in the transport of agricultural commodities.

4.12 HAZARDOUS, TOXIC, AND RADIOACTIVE MATERIALS

4.12.1 No Action Alternative

No impact concerning hazardous, toxic, or radioactive materials would occur as a result of taking no action to address the ongoing scour at the Jerry F. Costello Lock and Dam.

4.12.2 Repair Alternative

Rocks (riprap) utilized for the proposed scour repair would consist of quarry run limestone composed of newly quarried 650 pound and 400 pound topsize riprap. The materials would come from a USACE certified commercial stone quarry in the proposed project vicinity. The quarry must be able to produce stone which meets USACE specifications and would be free of organic and inorganic contaminants, in order to avoid adverse impacts to human health and the environment. Since no earthen borrow material is being used on this site, the likelihood of hazardous substances adversely affecting the project areas due to the proposed construction activities is very low. The St. Louis District Environmental Quality Section would be contacted immediately if suspected HTRW material was encountered at any point during construction.

4.13 AIR QUALITY AND NOISE

4.13.1 No Action Alternative

No effects to air quality or noise would result from the No Action Alternative.

4.13.2 Repair Alternative

During construction, there may be a temporary and localized reduction in air quality due to emissions from heavy machinery operating. However, once the proposed project is complete, no effects to air quality would occur. Since Randolph County, IL, is currently in attainment for all criteria pollutants, *de minimis* rates (e.g., ozone at 100 tons/year and carbon monoxide at 100 tons/year) are not applicable and a General Conformity analysis was not conducted (40 CFR §93.102). In addition, the proposed actions are considered as actions which would result in no emissions increases or an increase in emissions that is clearly *de minimis*. These actions include the repair and maintenance of administrative sites, roads, trails, and facilities. Therefore, effects of construction on air quality would be insignificant.

Construction of the proposed project may cause a temporary increase in noise in the project vicinity. Construction would require heavy equipment to operate in the area, such as boats, barges, and excavators, and these machines would generate noise during construction. This effect would only occur during the estimated three week construction period, and so is anticipated to be temporary and minor. Effects of the increased noise would be comparable to an increase in barge traffic and therefore is not anticipated to impact the quality of life in the surrounding area. Once the proposed project is complete, no increased effects due to noise would occur.

5 ENVIRONMENTAL JUSTICE

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

Randolph County, Illinois, has a population of approximately 33,934 with 11.1% of individuals below the poverty line and approximately 13% of individuals identifying as a non-white race (U.S. Census, 2016). The nearest populated area to the proposed project area is Modoc, Illinois, which has a population of approximately 123 individuals with 0.0% of individuals below the poverty line and approximately 0.0% identifying as a non-white race (U.S. Census, 2016). Therefore, the proposed action would not disproportionately affect minority or low-income populations nor have any adverse human health impacts. No interaction with other projects would result in any such disproportionate impacts. No cumulative impacts to Environmental Justice would be expected from interaction of the proposed action with other past, present, and reasonably foreseeable projects. Tribal governments that are also environmental justice communities in the project area have been engaged.

6 CLIMATE CHANGE

The USACE, Institute of Water Resources (IWR) published a document titled “Recent US Climate Change and Hydrology Literature Applicable to the U.S. Army Corps of Engineers Missions of the Upper Mississippi Region 07 in 2015”. The synopsis included in that document generally describes territory within the St. Paul, Chicago, Rock Island, and St. Louis USACE districts. The synopsis evaluated,

observed and projected trends in temperature, precipitation, and stream flow as well as the general consensus in the literature reviewed of the trending parameters.

The USACE IWR (2015) found a general consensus for a moderate to large upward trend in observed average temperature, minimum temperatures, average precipitation, extreme precipitation, and streamflow in the Upper Mississippi Region. There is a reasonable consensus that maximum air temperatures have decreased slightly in the recent past in the region. However, projected extreme precipitation is expected to have only a small increase with moderate consensus in the literature reviewed and forecasts of future hydrology and stream-flow are anticipated to be variable, with low overall consensus in the literature reviewed. Therefore, it was assumed that these watersheds are not anticipated to incur significant precipitation changes due to climate change within the anticipated 50 year period of analysis.

7 CUMULATIVE AND ADVERSE IMPACTS

This chapter identifies possible cumulative effects of the considered alternatives when combined with past trends and other ongoing or expected future plans and projects.

7.1 CUMULATIVE EFFECTS OVERVIEW

Cumulative effects result from the proposed action when added to other past, present, and reasonably foreseeable projects or actions. Cumulative effects are not caused by a single project, but include the effects of a particular project in conjunction with other projects (past, present, and future) on the particular resource. Cumulative effects are studied to enable the public, decision-makers, and project proponents to consider the “big picture” effects of a project on the community and the environment. In a broad sense, all impacts on affected resources are probably cumulative; however, the role of the analyst is to narrow the focus of the cumulative effects analysis to important issues of national, regional, or local significance (CEQ 1997).

The Council on Environmental Quality (CEQ) issued a manual entitled *Considering Cumulative Effects Under the National Environmental Policy Act* (1997). This manual presents an 11-step procedure for addressing cumulative impact analysis (Table 3). The cumulative effects analysis for the Jerry F. Costello Lock and Dam Upstream Scour Repair project followed these 11 steps (Table 3). The following subsections are organized by the three main components – scoping, describing the affected environment, and determining the environmental consequences.

Table 3. CEQ’s 11-step approach for assessing cumulative effects.

Component	Steps
Scoping	1. Identify resources
	2. Define the study area for each resource
	3. Define time frame for analysis
	4. Identify other actions affecting the resources
Describing the Affected Environment	5. Characterize resource in terms of its response to change and capacity to withstand stress
	6. Characterize stresses in relation to thresholds
	7. Define baseline conditions
Determining the Environmental Consequences	8. Identify cause-and-effect relationships

	9. Determine magnitude and significance of cumulative effects
	10. Assess the need for mitigation of significant cumulative effects
	11. Monitor and adapt management accordingly

7.2 SCOPING FOR CUMULATIVE EFFECTS

7.2.1 Bounding Cumulative Effect Analysis

Cumulative effect analysis requires expanding the geographic boundaries and extending the time frame to encompass additional effects on the resources, ecosystem, and human communities of concern.

7.2.1.1 Identifying Geographic Boundaries

The geographic boundaries for each resource was determined by the distribution of the resource itself, and the area within that distribution where the resource could be affected by the project in combination with other past, present, and reasonably foreseeable actions. The maintenance of the Kaskaskia River navigation pool governs the hydrology of the area. The segment of the Kaskaskia River between the L&D and Carlyle Lake is a physical boundary for several of the resources outlined in this Environmental Assessment (Table 4). For other resources evaluated, the Upper and Lower Kaskaskia River watersheds (HUC 07140201 & HUC 0710204, respectively) serves as a natural geographic boundary. However, the total ranges for state and federally-listed threatened and endangered species were used as a geographic boundary. Finally, Randolph County, Illinois, was also used as a geographic boundary for select resources.

Table 4. Geographic boundaries for the cumulative effects analysis for resources outlined in this Environmental Assessment.

Resource	Geographic Boundary
Vegetation & Wetlands	Kaskaskia Watershed
Aquatic Habitat	Kaskaskia Pool
Geology & Land use	Randolph County
Wildlife & Fisheries	Kaskaskia Watershed
IL Species of Concern	Total range
Threatened & Endangered Species	Total range
Water Quality	Kaskaskia Watershed
HTRW	Kaskaskia Pool
Historic & Cultural Resources	Randolph County
Socioeconomics & Transportation	Randolph County
Recreation & Aesthetics	Randolph County
Air Quality & Noise Levels	Randolph County

7.2.1.2 Identifying Timeframe

The timeframe for the cumulative effects analysis for each resource begins when past actions began to change the status of the resource from its original condition, setting the long-term trend currently evident and likely to continue into the reasonably foreseeable future. For all resources, the timeframe began in approximately 1950 when the Kaskaskia River watershed began to be altered by the construction of reservoirs and the L&D, and ends in 2068 (end of 50 year period of analysis for project).

7.2.2 Identifying Past, Present, and Reasonably Foreseeable Future Actions

Chapter 3 of this Environmental Assessment describes the condition of each resource in terms of their existing conditions and provides historical context for how the resource got to its current state. Information from discussions with resource managers, and online searches were used to assess the existing conditions of the identified resources. In order to identify present and reasonably foreseeable actions, information from resources managers and online resources were compiled. “Reasonably foreseeable actions” were defined as actions or projects with a reasonable expectation of actually happening, as opposed to potential developments expected only on a basis of speculation. The following criteria were applied to determine reasonably foreseeable actions:

- Actions on an agency’s list of proposed actions
- Actions where scoping has started
- Actions already permitted
- Actions where budgets have been requested

Based on these criteria, the following actions were identified as being reasonably foreseeable and were included in this cumulative effects analysis:

- **Master Plan for the Kaskaskia River Navigation Project (2016):** The 2016 Master Plan update incorporated a Watershed approach among the three Corps projects located on the Kaskaskia River: Lake Shelbyville, Carlyle Lake, and the Kaskaskia River Project. The Mast Plan identifies all known plans for channel maintenance, aquatic and terrestrial habitat restoration, recreational improvements, and land management framework from 2016 – 2019. Proposed items include: electric service for boats stopping for safe harbor at the lock, new campsites, extensions of sampling pads, electric service to campsites, a picnic shelter, floodproof vault comfort stations, a boat storage shed, the restoration of a prairie, and construction of interpretive trails and overlook areas. Maintenance dredging and dredge disposal would continue as part of the navigation project.
- **Kaskaskia River Basin Feasibility Study:** This study examines the Federal interest in implementing solutions to critical problems identified in a comprehensive watershed plan, which is aimed at restoring the Kaskaskia River Basin. The study authority allows for the development of a comprehensive plan that would address restoration, flood risk management, navigation, and water supply in the basin. This study is currently in an inactive status.
- **Kaskaskia Regional Port District Expansion:** The Kaskaskia Regional Port District (the “Port District”) provides shipping facilities and ports on the Kaskaskia River and promotes navigation and economic development on the waterway. The Port District helps maintain the navigation channel and terminals, through dredging, at Fayetteville, IL. They also help maintain the dredge disposal area discussed in this Environmental Assessment. They are expanding their second terminal for additional docking facilities.

Even though some of these activities allow for impacts to aquatic and terrestrial habitats, others allow for the restoration and improvements of wetlands, prairies, and aquatic habitats. The State of Illinois owns approximately 17,000 acres of land adjacent to the navigation pool and therefore has control of the use and development of these lands. The Corps also purchased 433 acres in fee title, 2,465 acres for operational easements, and 3,496 acres in flowage easements. The future development of any facilities on

these lands would require permits from the State of Illinois, the USACE St. Louis District, and the Kaskaskia Regional Port District.

7.3 CUMULATIVE EFFECTS BY RESOURCE

The remainder of this chapter describes the results of the cumulative effects analysis for each of the resources outlined in this Environmental Assessment (Chapters 3 & 4). The potential cumulative effects of addressing the existing scour hole on each resources was identified (Table 5). If a resource was not identified to have a cumulative effect, then this resource was not discussed in detail within this section.

The cumulative effects analysis discusses future conditions as follows:

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

Table 5. Checklist for identifying potential cumulative effects of repairing the scour holes.

Resource	Without Project	With Project	Past Actions	Other Present Actions	Other Future Actions	Project's Incremental Cumulative Impact
Vegetation & Wetlands	M	♦	H	♦	+	♦
Aquatic Habitat	M	S ¹	H	♦	+	♦
Geology & Land use	♦	♦	H	♦	♦	♦
Wildlife & Fisheries	M	S ¹	H	♦	+	♦
IL Species of Concern	♦	♦	M	♦	♦	♦
Threatened & Endangered Species	♦	♦	M	♦	♦	♦
Water Quality	S	S ¹	M	♦	♦	♦
HTRW	♦	♦	♦	♦	♦	♦
Historic & Cultural Resources	♦	♦	H	♦	♦	♦
Socioeconomics & Transportation	H	S ¹	+	+	+	+
Recreation & Aesthetics	S	S ¹	+	+	+	+
Air Quality & Noise Levels	♦	S ¹	S	♦	♦	♦

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

7.3.1 Socioeconomics & Transportation

Past actions have greatly improved the transportation of commodity items throughout the Kaskaskia Watershed, thus increasing the local economies. The construction of the Jerry F. Costello L&D and the establishment of Lake Shelbyville and Carlyle Lake have altered the hydrology of the Kaskaskia River to allow safe and reliable navigation in the lower Kaskaskia River. Reliable navigation has aided the use of coal fired power plants and the transport of agricultural resources (e.g., crops and fertilizer). The predominance of agriculture within the watershed is likely to remain into the foreseeable future. The Port

District has also expanded their operations by constructing an additional terminal in order to accommodate a recent increase in barge traffic.

Without Project: The gradual increase and migration of the scour holes toward the Tainter gates could lead to the failure of the L&D. The failure of the L&D would lead to a reduction or elimination of barge transportation in the lower Kaskaskia River, ultimately affecting the local economies.

Considered Action Alternative: No negative cumulative impacts would be expected from the considered action alternative, combined with other present actions by others, and reasonably foreseeable actions. The proposed project should have positive long-term benefits to the socioeconomics and transportation within the Kaskaskia watershed.

7.3.2 Recreation & Aesthetics

Past and present actions have altered recreational opportunities and the aesthetics of the Kaskaskia watershed. The construction of the L&D and the establishment of Lake Shelbyville and Carlyle Lake have altered the hydrology of the Kaskaskia River, transforming it from a natural river system to a series of reservoirs and a lake-like river system. These alterations have increased bankline erosion in some regions, decreasing the overall aesthetics. However, the increase in water elevation for navigation has increased the boating and fishing opportunities on the river. In addition, state and federal agencies purchased large areas of land, bordering the navigation pool, which support navigation, therefore increasing public opportunities for hunting, fishing, hiking, and bird watching. State and federally owned lands adjacent to these water bodies ultimately restricts urban development, further adding to the aesthetics of the predominately agricultural watershed.

Without Project: The gradual increase and migration of the scour holes toward the Tainter gates could lead to the failure of the L&D. The failure of the L&D would lead to a reduction of water elevation. This could have negative impacts on boating and other recreational activities on the Kaskaskia River. Reduced water elevation could also disconnect backwater habitats, further reducing recreation opportunities. In addition, the reduction could result in miles of exposed banklines.

Considered Action Alternative: No negative cumulative impacts would be expected from the considered action alternative, combined with other present actions by others, and reasonably foreseeable actions. The proposed project should have positive long-term benefits to recreation opportunities and the aesthetics within the Kaskaskia watershed.

8 COORDINATION

Notification of this Draft Environmental Assessment and unsigned Finding of No Significant Impact was sent to officials, agencies, organizations, and individuals for public review and comment (Table 6). Additionally, an electronic copy is available during the public review period on the USACE St. Louis District's website at:

<http://www.mvs.usace.army.mil/Portals/54/docs/pm/Reports/EA/JFCLockandDamScourRepairEA.pdf>

Please note that the Finding of No Significant Impact is unsigned and will only be signed into effect after careful consideration of the comments received as a result of this public review. In addition, to ensure compliance with the National Environmental Policy Act, Endangered Species Act, and other applicable

environmental laws and regulations, coordination with these entities and individuals will continue, as required, throughout the execution of the scour repairs.

Table 6. A letter regarding the availability of a draft Environmental Assessment and unsigned FONSI for the proposed scour hole repairs was sent to the following entities:

<p>Matt Mangan Acting Field Supervisor U.S. Fish and Wildlife Service Marion Illinois Suboffice 8588 Route 148 Marion, IL 62959</p>	<p>Adam Rawe Resource Planner Impact Assessment Section Illinois Department of Natural Resources 1 Natural Resources Way Springfield, IL 62702</p>
<p>Sierra Club Illinois Chapter 70 E Lake Street, Suite 1500 Chicago, IL 60601</p>	<p>The Nature Conservancy Chicago Office 8 South Michigan Avenue Suite 900 Chicago, Illinois 60603</p>
<p>Traci McCauley Natural Resources Illinois Department of Agriculture 801 Sangamon Ave. P.O. Box 19281 Ag Bldg – FL 001 Springfield, IL 62794</p>	<p>Rachel Leibowitz Illinois State Historic Preservation Office Illinois Department of Natural Resources 1 Natural Resources Way Springfield, IL 62702</p>
<p>William R. Haine State Senator 56th District 311C Capitol Building Springfield, IL 62706</p>	<p>Daniel V. Beiser State Representative House District 111 269-S Stratton Office Building Springfield, IL 62706</p>
<p>Richard Durbin U.S. Senator IL 711 Hart Senate Building Washington, D.C. 20510</p>	<p>Tammy Duckworth U.S. Senator IL 524 Hart Senate Office Building Washington, D.C. 20510</p>
<p>Mike Bost U.S. House of Representatives 12th Congressional District of Illinois 1440 Longworth House Office Building Washington, DC 20515</p>	<p>Ivan Dozier State Conservationist NRCS Illinois State Office 2118 W. Park Court Champaign, IL 61821</p>
<p>Ronald Moore Izaak Walton League of America-Illinois Division 55 Ridgcrest Drive Decatur, IL 62521-5425</p>	<p>Heartlands Conservancy 406 East Main Mascoutah, Illinois 62258</p>
<p>Federal Emergency Management Agency 536 South Clark Street, 6th Floor Chicago, IL 60605 312-408-5500</p>	<p>Illinois Environmental Protection Agency 1021 N Grand Ave E Springfield, IL 62702</p>

<p>Alan Walts Office of Enforcement and Compliance Assurance U.S. EPA-Region 5 77 W. Jackson Blvd. Chicago, IL 60604</p>	<p>Kaskaskia Regional Port District 336 N. Main St. Red Bud, IL 62278</p>
<p>Randolph County Herald Tribune 2204 State St. PO Box 269 Chester, IL 62233</p>	

9 ENVIRONMENTAL COMPLIANCE

Guidance	Degree of Compliance
Federal Statutes	
Archaeological and Historic Preservation Act, as Amended, 16 U.S.C. 469, et seq.	PC ¹
Bald and Golden Eagle Protection Act, 42 USC 4151-4157	FC
Clean Air Act, as Amended, 42 U.S.C. 7401-7542	FC
Clean Water Act, as Amended 33 U.S.C. 1251-1375	PC ²
Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC 9601-9675	PC ²
Endangered Species Act, as Amended, 16 U.S.C. 1531-1543	PC ²
Farmland Protection Policy Act, 7 U.S.C. 4201-4208	PC ²
Federal Water Project Recreation Act, as Amended. 16 U.S.C. 4601, et seq.	FC
Fish and Wildlife Coordination Act, as Amended, 16 U.S.C. 661-666c	PC ²
Land and Water Conservation Fund Act, as Amended, 16 U.S.C. 4601, et seq.	FC
National Environmental Policy Act, as Amended, 42 U.S.C. 4321- 4347	PC ³
National Historic Preservation Act, as Amended, 54 U.S.C 300101, et seq.	PC ¹
Noise Control Act, 42 USC 4901, et seq.	FC
Migratory Bird Treaty Act of 1918, 16 USC 703, et seq.	PC ²
Resource Conservation and Recovery Act, 42 USC 6901-6987	PC ²
Executive Orders	
Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (EO 12898)	FC
Floodplain Management, E.O. 11988 as amended by E.O. 12148	FC
Protection of Wetlands, E.O 11990 as amended by E.O. 12608	FC
Protection and Enhancement of the Cultural Environment, E.O. 11593	PC ¹
Consultation and Coordination with Indian Tribal Governments, 06 Nov 2000, E.O. 13175	PC ¹
Protection of Migratory Birds (EO 13186)	FC

FC = Full Compliance, PC = Partial Compliance.

1. Full compliance will be attained after all required archaeological investigations, reports and coordination have been completed.
2. Full compliance will be attained upon completion of any permitting requirements or coordination with other agencies.
3. Full compliance will be attained upon signing of the NEPA decision document.

Applicable permits:

Nationwide Permit No. 3 – Maintenance of previously authorized structures. This Nationwide Permit authorizes the repair, rehabilitation, or replacement of any previously authorized, currently serviceable structure or fill, or any currently serviceable structure or fill authorized by 33 CFR 330.3, provided that the structure or fill is not to be put to uses differing from those uses specified or contemplated for it in the original permit or most recently authorized modification. This NWP also authorizes the removal of

previously authorized fill. All excavated materials must be deposited and retained in an area that has no waters of the United States unless otherwise specifically approved by the district engineer under separate authorization. In the state of Illinois, this NWP includes Section 401 of the Clean Water Act Certification. This Certification requires the use of Best Management Practices (BMPs) to protect water quality, preserve natural hydrology, and minimize the overall impacts to aquatic resources during and after construction (see Sections 4.2 and 4.4) and the assessment of any potential impacts to State threatened and endangered species (see Section 4.6).

10 LIST OF PREPARERS

- Alison Anderson, Ph.D., Environmental Coordinator
- Kevin Slattery, HTRW
- Mark Smith, Ph.D., Cultural and Tribal Coordinator
- Charles Frerker, Regulatory
- Adam Ramseyer, Project Manger
- Doug Reilly, Civil Engineer

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FINDING OF NO SIGNIFICANT IMPACT

Jerry F. Costello Lock and Dam Upstream Scour Repair
Kaskaskia River, River Mile 0.8
Randolph County, Illinois

1. In accordance with the National Environmental Policy Act, I have reviewed and evaluated the documents relevant to the scour hole repairs located at the Jerry F. Costello Lock and Dam. The work involves the excavation and land disposal of approximately 200 cubic yards of bed material, and the placement of 0.23 acres of fill material: 360 tons of riprap, 280 tons of crushed stone, and 670 cubic yards of concrete.

The project area consists of the Kaskaskia River at the Jerry F. Costello Lock and Dam, and existing operations areas adjacent to the Lock and Dam. The disposal containment area used for this project was established during the construction of the Lock and Dam in order to support the maintenance of the 9-ft Navigation Channels on both the Kaskaskia and Mississippi Rivers. Use of this area is expected to continue as described in the Kaskaskia River Master Plan.

2. As part of this evaluation, I have considered the following project alternatives:
 - a. Repair Alternative (Tentatively Selected Plan) - USACE would repair the scour holes upstream of the Jerry F. Costello Lock and Dam using a combination of rip-rap, concrete blocks, and poured concrete.
 - b. No Action Alternative- Under this alternative, no federal action would take place and the scour hole would not be repaired.
3. The possible consequences of the two alternatives have been studied for physical, environmental, cultural, social, economic, aesthetic, and recreational effects. Significant factors evaluated as part of my review include:
 - a. Socioeconomic, transportation, and recreation resources would accrue benefits as a result of the project.
 - b. No adverse impacts to federally threatened or endangered species are anticipated.
 - c. The proposed scour hole repair would have no adverse impact upon archaeological remains or historic properties.
 - d. No significant impacts to natural resources are anticipated, including fish and wildlife resources and wetlands. The proposed repairs would have no adverse impacts to the physical environment (e.g., noise, air and water quality) nor would the project adversely impact low-income or minority populations.
 - e. The scour hole repairs would require the placement of fill material below ordinary high water which is permitted under Nationwide Permit No. 3 for the maintenance of previously authorized structures.

- f. The “No Action” alternative was evaluated and would be unacceptable to recommend as it does not meet the project purpose of repairing scour holes and repair of these features would allow the Lock and Dam to properly function and avoid dam undermining and potential failure.
4. 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) was achieved through coordination with the Illinois State Historic Preservation Office. The Fish and Wildlife Service reviewed 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 the Environmental Assessment.
5. Based on my analysis and evaluation of the alternative courses of action presented in the Environmental Assessment, I have determined that the implementation of the Tentatively Selected Plan would not have significant effects on the quality of the environment. Therefore, an Environmental Impact Statement will not be prepared prior to proceeding with this action.

(Date)

Bryan K. Sizemore
Colonel, U.S. Army
District Commander

ATTACHMENT 1: STATE AGENCY CORRESPONDENCE

**ATTACHMENT 2: FISH AND WILDLIFE SERVICE
CORRESPONDENCE**

**ATTACHMENT 3: ILLINOIS STATE HISTORIC
PRESERVATION OFFICE & TRIBAL CORRESPONDENCE**
