Supplemental Environmental Assessment

Appendix D: Fish and Wildlife Coordination Act Report

Arkansas River Navigation Study
Arkansas and Oklahoma

September 2024

Prepared By:

Regional Planning and Environmental Center
Environmental Branch
U.S. Army Corps of Engineers
Little Rock and Tulsa Districts

United States Department of the Interior

FISH AND WILDLIFE SERVICE
110 S. Amity Road, Suite 300
Conway, Arkansas 72032
Tel.: 501/513-4470 Fax: 501/513-4480

IN REPLY REFER TO:

July 12, 2024

Colonel Damon Knarr
U.S. Army Corps of Engineers
Little Rock District
P.O. Box 867
Little Rock, AR 72203-0867

Dear Colonel Knarr:

The following comments and recommendations represent the position of the U.S. Fish and Wildlife Service (USFWS) under the authority of the Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. 661-667e). For over twenty years, the USFWS has coordinated with the Little Rock District of the U.S. Army Corps of Engineers (USACE) to develop a plan to deepen the authorized navigation channel along the McClellan-Kerr Arkansas River Navigation System (MKARNS) from a draft depth of nine feet to twelve feet. This included the 2005 publication of the USACE Environmental Impact Statement (EIS) and Feasibility Report (FR) which contained a USFWS-authored Coordination Act Report (CAR).

The USACE recently received appropriations for the funding of updated planning documents and a portion of requested construction funds for this project. This resulted in the publication of the recent Draft Supplemental Environmental Assessment (SEA) and Draft Finding of No Significant Impact (FONSI) as well as a request for an updated CAR. The USFWS is a cooperating agency in the development of the updated plan and coordinated over the last year to provide informal comments. To expedite this process, the USFWS agreed to participate in the development and final editing of a USACE-authored CAR supplement. The following CAR supplement constitutes the USFWS's final report as required by section 2(b) of the FWCA. The Arkansas Game and Fish Commission (AGFC) and Oklahoma Department of Wildlife Conservation (ODWC) also participated in the review and editing of the USACE-authored supplemental CAR draft and will provide separate responses per the FWCA in addition to the input provided within this document.

The need for early and frequent coordination with the USFWS and states during all phases of this and other projects is a key to success. The phased approach and uncertainty regarding the specificity and timing of project features identified within the SEA increases this need. This coordination clarifies avoidance and minimization measures and may reduce the need for compensatory mitigation. Early coordination is consistent with the "Agreement Between the US. Fish and Wildlife Service and the U.S. Army Corps of Engineers for Conducting Fish and Wildlife Coordination Act Activities." This agreement, signed in 2003, was developed to ensure that the USFWS is involved in USACE projects as an active planning team member to find solutions to water resource development problems that avoid, minimize, or mitigate the impacts

to fish and wildlife. Any technical questions related to this response may be directed to Jason Phillips at 870-503-1101 or jason_phillips@fws.gov.

Sincerely,

Jason Hight, Field Supervisor
Arkansas Ecological Services Office

Cc: Kevin Stubbs, Biologist, USFWS Oklahoma Field Office
Damon Taylor, Refuge Manager, SNWR
Marian Schwarz, Water Resources Engineer, USFWS Region 2 Refuges
Kirsty Bramlett, Supervisory Hydrologist, USFWS Region 2 Division of Water Resources
Patrick Fitzmorris, Project Leader, USFWS, DBWRNWR
Jennifer Sheehan, Chief, Environmental Coordination Division, AGFC
Jeff Quinn, River and Stream Program Supervisor, AGFC
Chelsea Gilliland, Large River Biologist, AGFC
Brett Thompson, Wildlife Biologist, ODWC
Chris Whisenhunt, Senior Biologist, ODWC
Paxton Smith, Wildlife Biologist, ODWC

McClellan-Kerr Arkansas River Navigation System

Supplemental Coordination Act Report

Supplemental
Fish and Wildlife Coordination Act Report
on the
McClellan-Kerr Arkansas River Navigation System

Prepared by:

U.S. Army Corps of Engineers
Regional Planning and Environmental Center
Little Rock and Tulsa Districts

and

U.S. Fish and Wildlife Service
Southeast Region

in coordination with

Arkansas Game and Fish Commission

Oklahoma Department of Wildlife Conservation

July 2024

EXECUTIVE SUMMARY

This document has been prepared by the U.S. Army Corps of Engineers (USACE) in coordination with the U.S. Fish and Wildlife Service (USFWS), the Arkansas Game and Fish Commission (AGFC), and the Oklahoma Department of Wildlife Conservation (ODWC) to summarize the final report on the fish and wildlife resources likely to be impacted by proposed actions related to the McClellan-Kerr Arkansas River Navigation Study. This document is intended to supplement and update the 2005 Coordination Act Report where appropriate. Therefore, references are made to the original 2005 CAR which is available as an appendix (Appendix A).

The USACE Little Rock and Tulsa Districts are charged with the operation and maintenance of the McClellan-Kerr Arkansas River Navigation System (MKARNS) for commercial navigation. The following features are considered: River Flow Management, Navigation Channel Deepening, Navigation Channel Maintenance.

The final report 1) identifies the effects of actions proposed to maintain and improve navigation on the MKARNS on fish and wildlife resources within the project area, 2) discusses measures to appropriately identify, avoid, and minimize environmental impacts, and 3) provides recommendations to appropriately compensate for unavoidable impacts to fish and wildlife resources and to maintain the value of the fish and wildlife resources associated with the navigation system.

The project area consists of the entire 445-mile-long MKARNS in Arkansas and Oklahoma, which contains a diversity of high-quality fish and wildlife resources.

NAVIGATION CHANNEL DEEPENING

The purpose of the proposed Navigation Channel Deepening feature is to remove the disparity between the navigation channel depths of the MKARNS (9 feet) and the Lower Mississippi (12 feet), and thereby increase the volume and efficiency of commercial navigation operations. The proposed action is anticipated to have direct and indirect effects to important fish and wildlife resources. Impacts would include the loss of terrestrial habitat due to the disposal of dredged material in upland sites; loss of aquatic habitat due to disposal of dredged material in aquatic sites and construction and raising of river training structures; removal and alteration of gravel bars, which support a variety of aquatic species, due to dredging activity; and adverse effects on freshwater mussel patches and beds (i.e. mussel concentrations) due to dredged activity and disposal of dredged material.

Habitat Evaluation Procedures (HEP) were used to conduct assessments at terrestrial and aquatic dredged material disposal sites and selected mitigation sites. A total of 1,574 average annual habitat units (AAHUs) are anticipated to offset the net loss of unavoidable impacts to bottomland hardwood forests, dike field and backwater habitats, and gravel bars. More details are available in Chapter 10 and Appendix E.

FEDERALLY LISTED SPECIES

Several federally listed species occur in the project area. Formal consultation under Section 7 of the Endangered Species Act (ESA) is in progress for the following species: Alligator snapping turtle (*Macrochelys temminckii*, Proposed Threatened), American burying beetle (*Nicrophorus americanus*, Threatened), eastern black rail (*Laterallus jamaicensis jamaicensis*, Threatened), fat pocketbook (*Potamilus capax*, Endangered), gray bat (*Myotis grisescens*, Endangered), harperella (*Ptilimnium nodosum*, Endangered), Indiana bat (*Myotis sodalis*, Endangered), ivory-billed woodpecker (*Campephilus principalis*, Endangered), Missouri bladderpod (*Physaria filiformis*, Threatened), monarch butterfly (*Danaus plexippus*, Candidate), Neosho mucket (*Lampsilis rafinesqueana*, Endangered), northern long-eared bat (*Myotis septentrionalis*, Endangered), Ozark big-eared bat (*Corynorhinus townsendii ingens*, Endangered), pallid sturgeon (*Scaphirhynchus albus*, Endangered), pink mucket (*Lampsilis abrupta*, Endangered), piping plover (*Charadrius melodus*, Threatened), pondberry (*Lindera melissifolia*, Endangered), rabbitsfoot (*Quadrula cylindrica cylindrica*, Threatened), red-cockaded woodpecker (*Dryobates borealis*, Endangered), rufa red knot (*Calidris canutus rufa*, Threatened), tricolored bat (*Perimyotis subflavus*, Proposed Endangered), and whooping crane (*Grus americana*, Endangered (OK)/Experimental Population, non-essential (AR)).

The study allows the USACE to carry out both Section 7(a)1 and 7(a)2 responsibilities, as mandated by the ESA. Section 7(a)1 of the ESA requires that all federal agencies use the appropriate authorities to carry out programs for the specific purpose of conserving threatened and endangered species. Section 7(a)2 responsibilities are addressed in the USFWS biological opinion.

POSITION OF THE USFWS

The funding and construction of the MKARNS 12-foot draft channel will be done in phases. Current funding only covers the development of updated planning documents and the construction of a portion of the proposed river training structures. The details of the updated plan, while differing from the original 2005 plan in the number and locations of training structures and dredging sites due to changes in the river over the intervening decades, will require ongoing updates as the USACE evaluates the response of the river to the construction of the features in the initial phase. The phased approach to funding and construction of the MKARNS channel enlargement makes a definitive assessment of fish and wildlife effects and recommendations for avoidance and minimization and measures for compensatory mitigation difficult. Therefore, ongoing coordination with the USFWS and state conservation agencies is essential as project features are funded and designed. This will allow the development of project designs that avoid sensitive habitats and minimize effects to other sensitive resources, thus

reducing the need for compensatory mitigation. Early coordination will also allow time for conservation agencies to recommend appropriate compensatory mitigation for unavoidable losses.

The USACE planning documents indicate an assumption that aquatic and terrestrial resources present along the MKARNS have not significantly changed since the finalization of the 2005 EIS/FR. Several studies indicate a loss of permanent and seasonal aquatic habitats between 1984 and 2015 in some reaches of the MKARNS. The Sequoyah National Wildlife Refuge (SNWR) has documented changes in terrestrial habitats due to flooding, drought, invasive species, and succession. The USACE contends that these losses or changes, while concerning, are of low priority given the broad scale gains and losses that have likely occurred throughout the system. This assumption may hold true in the broad scale over the entirety of the MKARNS, but local scale changes may have taken place in areas that are deemed important fish and wildlife habitats. This includes publicly managed habitats such as the SNWR, state managed lands, and other habitats that are used by rare and/or federally listed species or other important managed species. The desire to avoid and minimize habitat losses in these important areas and provide adequate compensatory mitigation when losses are unavoidable necessitates ongoing coordination with the USFWS and state agencies as project features are implemented.

Shallow backwater habitats are one of the significant aquatic resources at risk from water training structures and dredge disposal. Unavoidable losses will be assessed, and compensatory mitigation calculated, using a certified USACE “marsh” model, which for the purposes of this study, is synonymous with shallow backwater habitats. These habitats are important as spawning and nursery sites for a variety of fishes. The AGFC and ODWC place special importance on these habitats due to their value for the management of the popular sport fishery within the MKARNS. These backwater habitats also support rare species such as the alligator snapping turtle, which is proposed for federal listing as threatened. It is important that the USACE coordinate closely with the USFWS and states to avoid and minimize the losses of these habitats and design acceptable compensatory mitigation for unavoidable losses. Analysis of effects to the alligator snapping turtle, other species proposed for listing, or other currently listed species, is currently underway via consultation under Section 7 of the Endangered Species Act (ESA). The USFWS Oklahoma Field Office is the lead contact for ESA consultation.

River reaches dominated by gravel substrates are a relatively rare resource within the MKARNS and serve as spawning habitat for some fishes and as habitat for unique fishes and freshwater mussels. Gravel bars in the upper reaches of the MKARNS may support federally listed freshwater mussels including the rabbitsfoot. The 2005 EIS/FR estimated that 165 acres of gravel substrate would be affected by proposed dredging. In the SEA, the USACE retains this estimated impact area and assumes it to be conservative due to the reduced amount of proposed dredging. The USACE used an

existing, certified model for paddlefish (*Polyodon spathula*) to estimate the amount of compensatory mitigation required for unavoidable losses of this important habitat. The model determined that a replacement ratio of 1:1 would be adequate to offset losses. This mirrors the assumed replacement ratio from the 2005 EIS/FR. It is important to note that the actual amount of gravel substrate habitat present within the MKARNS may have changed in recent decades due to the passage of time and several large flood events. The habitat within each proposed dredge area should be assessed prior to finalization of plans to determine the extent of gravel present and, if recommended by the USFWS, determine if federally listed species are present. Each proposed dredge reach should also be assessed to determine where suitable compensatory mitigation may be appropriate. Gravel bar habitat can only be sustained in areas exhibiting suitable flow conditions that prevent the coverage of gravel substrate by sand or silt sediments. Areas with such conditions will likely already have gravel substrate present or may be associated with existing or newly constructed river training structures. As with mitigation planning for other habitat types, close coordination with the USFWS and states prior to, during, and after dredging is critical to maximize success. Monitoring of gravel relocation sites to ensure sustainability should be an integral part of every compensatory mitigation plan for gravel bars.

In addition, the USACE should anticipate additional losses if the infrastructure at these sites fails. An example of a failure resulting in additional habitat losses is found at one of the historical upland disposal sites along the lower reaches of the MKARNS on land managed by the Dale Bumpers White River National Wildlife Refuge (DBWRNWR). For decades, the refuge issued special use permits to allow the construction and use of a ring levee for containment of dredge spoil slurry. At some point, the structure designed to allow water drainage failed and allowed sand and silt to flow out of the ring levee into a nearby stream. This inhibited the drainage of surrounding bottomland hardwoods and resulted in the death of several hundred acres of trees. To date, the USACE has refused the refuge's request to fix the damaged structure and rehabilitate the nearby stream to restore drainage. As a result, DBWRNWR no longer issues special use permits for the upland disposal of dredge spoil. For any upland dredge disposal sites planned for the MKARNS 12-foot channel project, the USACE should commit to and plan for the maintenance and repair of all containment structures and the rehabilitation of any habitat losses resulting from failures. This is especially true for structures built on or near sensitive lands such as National Wildlife Refuges, state management areas, and/or areas set aside as compensatory mitigation for the original MKARNS project.

An important area of disagreement between the USFWS/states and the USACE is the issue of compensatory mitigation for the loss of upland habitats. In the 2005 EIS/FR, the USACE committed to compensatory mitigation for unavoidable losses of these habitats. In the latest planning documents for the MKARNS 12-foot channel project, the USACE indicated that their policy only allows them to attempt to avoid and minimize losses. Their policy does not allow upland compensatory mitigation and they lack a funding mechanism. Only upland areas deemed "significant" may warrant compensatory

mitigation. A definition for “significant” habitats was not provided, although responses to informal comments indicated that it would take a lot of evidence to meet the standard. The USFWS and states contend that any upland habitat losses that occur on lands publicly managed for wildlife meet the definition of “significant.” This is especially true if those lands were set aside as mitigation for previous losses due to the original MKARNS project. Over 1,700 acres of upland habitats are anticipated to have temporary impacts and over 800 acres would have permanent impacts. Approximately 200 acres of forested habitat would be permanently lost. Some of these habitats may support federally listed species. Most of these acres are on lands managed by the USFWS in SNWR or by the ODWC. There may be other uplands that we also deem “significant” due to the presence of rare habitats or rare species. Early and frequent coordination with the USFWS and states is critical to avoid and minimize losses of important upland habitats and to determine compensation for unavoidable losses of significant habitats.

Opportunities will exist for the beneficial use of spoil materials within the MKARNS. In the past, this material has been used for the creation of sandbar islands for the formerly listed interior least tern (*Sternula antillarum athalassos*). The maintenance of high-quality nesting islands along the large rivers in the Mississippi River Valley was critical to the recovery of this species, and the USACE committed to continuing this beneficial use of dredge materials. There may be other opportunities for beneficial uses of material to create other in-channel habitats, side channels, and other off-channel habitats. Consultation with the USFWS and states prior to planning for specific dredging sites will ensure that use of dredge spoils is optimized for the benefit of interior least terns and other species when possible.

In the 2005 EIS/FR, the USACE indicated they would work with the states to mitigate for the losses of significant state resources such as dense mussel beds. The states consider these to be publicly owned, state-managed resources worthy of compensatory mitigation. In updated planning documents, the USACE indicated that they have no mechanism to compensate for the loss of non-federally listed species. The USFWS recommends that you continue to investigate avenues to identify, avoid, and compensate for losses of these significant state resources. Historical surveys indicated the presence of very dense mussel beds within the Post Canal near the lower end of the MKARNS. The ODWC suspects the presence of state-listed mussels in the Verdigris River just upstream of the MKARNS, and the USFWS suspects that the federally threatened rabbitsfoot may occur in gravel bars within the upper portions of the project area. Close coordination with the USFWS and states is recommended to avoid these resources where possible and develop mitigation options if significant resources are identified.

The need for early and frequent coordination with the USFWS and states prior to the detailed design and implementation of any new river training structures, terrestrial or aquatic dredge disposal sites, or dredge reaches, is a recurring theme within the

recommendations. This is necessitated by the phased approach and uncertainty regarding the specificity and timing of all project features identified within the SEA. It is very important that coordination take place early and the USFWS and states have a role in not just reviewing plans but as an integral part of the early design team. This will make avoidance and minimization of fish and wildlife resources much more achievable and reduce the need for compensatory mitigation.

Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1. Introduction

This Supplemental Fish and Wildlife Coordination Act Report (CAR) has been developed to supplement the Final CAR prepared by the U.S. Fish and Wildlife Service (USFWS) in June 2005 for the Arkansas River Navigation Study (ARNS), Arkansas and Oklahoma (ARNS), McClellan-Kerr Arkansas River Navigation System (MKARNS) dated August 2005 (2005 FR/EIS). This Supplemental CAR provides updated information on fish and wildlife resources associated with the MKARNS (Figure 1) for use during the design and implementation of the MKARNS 12-foot Navigation Channel Deepening Project. References to the 2005 CAR (Appendix A of this document) will be made where practicable to reduce repetition.

This report will accompany a Supplemental Environmental Assessment prepared for this project by the U.S. Army Corps of Engineers (USACE), Southwestern Division, Regional Environmental and Planning Center (RPEC) to 1) provide a concise summary of the history and status of the originally-authorized ARNS Project; 2) document current changes and refinements made to the MKARNS 12-Foot Channel design, including mitigation, and; 3) evaluate the potential environmental effects of the updated construction and design plans that may have changed since the FEIS was completed.

The Final Feasibility Report and Environmental Impact Statement for the ARNS dated August 2005 (2005 FR/EIS) and the Report of the Director of Civil Works (Director's Report) signed on 27 September 2005 recommended modifications and improvements for navigation and channel maintenance. The Recommended Plan consisted of three broad components:

- Component 1 would change the existing MKARNS dredge material disposal plan for the existing 9-foot channel with new dredge material disposal sites;
- Component 2 would replace the existing flow management plan for the MKARNS with an Operations Only component to improve navigation and hydropower; and
- Component 3 would deepen the navigation channel throughout the MKARNS from 9 feet to 12 feet.

The recommended plan was authorized by Congress in the 2004 Water Resources Development Act (WRDA) (Sec 136, Public Law 108-137). Implementation of the first two components began after authorization and continues throughout the MKARNS.

For more information on the history of the project, refer to Appendix A of this document.

The USACE received Operations and Maintenance funds in the mid-2000s to begin work on the third component (deepening the navigation channel). These funds were used to construct some rock revetments and dike notching identified for the 12-foot channel component, thus marking the start of construction. Updating the dredge material management plan in response to the creation of new disposal sites (Component 1) is also part of the MKARNS 12-foot Channel Deepening Project. Flow management plan changes were implemented following the authorization of the ARNS

recommended plan and are therefore not included in the scope of the MKARNS 12-foot Channel project.

Changes in river conditions and new hydrologic survey data and information has warranted changes in the design of the 2005 approved 12-foot MKARNS Channel Deepening Project. Additional appropriations received in the FY22 Infrastructure Investment and Jobs Act (IIJA)are being used to update hydrologic modeling and project designs, as well as updating National Environmental Policy Act (NEPA) compliance, economics, costs, and continue construction of the 12-foot navigation channel.

This Supplemental CAR has been prepared under the authority of and in accordance with the Fish and Wildlife Coordination Act (FWCA; 48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and fulfills the reporting requirement set forth in Section 2(b) of the FWCA.

2. Description of Authorized Project

The MKARNS system is approximately 445 miles in length and consists of a series of 18 locks and dams (Figure 1). The USACE Tulsa and Little Rock Districts cooperatively control flows in the Verdigris River in Kansas, and Arkansas River in Oklahoma and Arkansas.

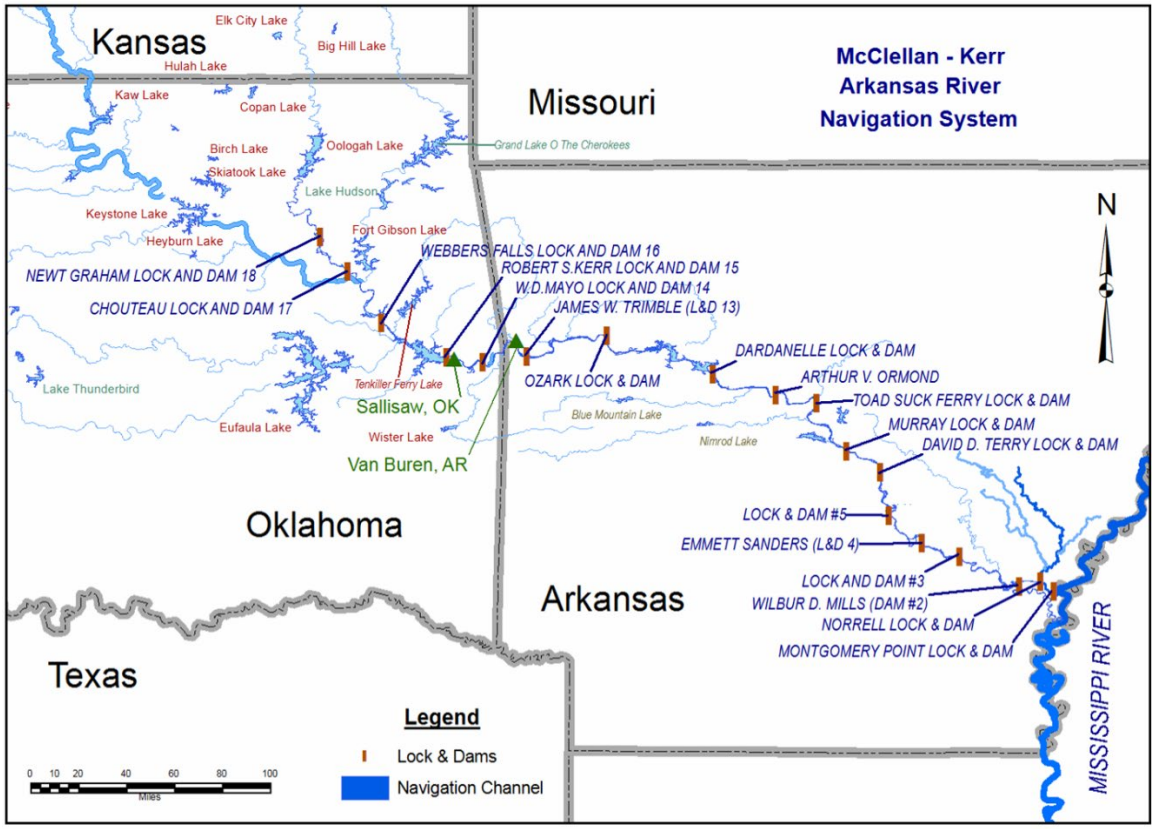

Figure 1 McClellan-Kerr Arkansas River Navigation System.

River flow and water storage on the MKARNS is predominantly regulated through 11 reservoirs in Oklahoma. Details on these reservoirs can be found on page 10 of Appendix A.

The authorized project includes the MKARNS from the Port of Catoosa near Tulsa, Oklahoma, downstream to the confluence of the Mississippi River in Southeastern Arkansas.

- A 50-mile reach of the Verdigris River from the Port of Catoosa to Muskogee (navigation miles 445-394).
- Lower Arkansas River, which comprises 375 miles of the MKARNS (navigation miles 394 to 19).
- The Arkansas Post Canal, a 9-mile canal connecting the Arkansas River to the lower White River (navigation miles 19 to 10).
- The lower 10 miles of the White River (navigation miles 10 to 0).

Channel widths and depths vary throughout the system. While the navigation channel is currently maintained to a minimum 9 feet, the majority of the system is already at a depth of ≥ 12 feet. To further clarify, the "navigation channel" refers to the draft, also known as keel depth. A 12-foot navigation channel may require river depths of 13-15 feet as a safety buffer to allow for wave action, water level fluctuations, and sedimentation while preventing the need for more frequent maintenance dredging.

Details on the project area, including descriptions of ecoregions, geology and soils, vegetation, aquatic and terrestrial biota, wetlands, and other natural resouces can be found in the 2005 CAR (Appendix A) and MKARNS Map Book for visuals of the full study area (Appendix C).

3. MKARNS 12-Foot Channel Project Description

The MKARNS 12-Foot Channel Deepening Project consists of three separate components. The first will include the construction or modification of 112 training structures. These training structures will allow the river to self-scour naturally over time, minimizing the total amount of mechanical dredging necessary.

The second component of the proposed project will include the mechanical dredging of approximately 3700 acres for any area that is unable to self-scour.

The final component addresses the disposal locations for the dredged material. This project will include the use of both existing and new upland and in-water disposal locations that will be used for the deposition of dredge materials. These areas include the following:

- 37 new upland sites in Oklahoma and 2 new upland sites in Arkansas
- 170 existing in-water sites in Arkansas
- 30 beneficial-use dredge sites identified for sandbar islands.

The new upland disposal sites selected are a mix of open fields, agricultural lands, and forested areas.

4. MKARNS 12-Foot Channel Design Changes from 2005

Since the 2005 FR/FEIS, changed river conditions and new surveying data and information have warranted changes in the MKARNS 12-Foot Channel design. No significant changes to the plans themselves have been made; instead, the original design has been further refined and locations of design features narrowed down. The design plans are continuously evolving as new survey data is collected and analyzed. Additional NEPA documentation will be completed as needed moving forward to evaluate future changes. The 2005 ARNS included a range of operational and flow management factors in addition to deepening the navigation channel; however, this supplemental CAR focuses on the channel deepening feature exclusively. For more detail on the approved 2005 proposed project, refer to the 2005 FR/FEIS and CAR. The MKARNS 12-Foot Channel design outlined in the 2005 FR/FEIS remains the proposed action, however some locations of design features have changed as follows.

4.1 Proposed River Training Structures

Approximately 85-90 percent of the Arkansas River is currently at ≥ 12-foot navigation depth. Sustaining that depth and alignment for hundreds of miles requires construction of river training structures inside and outside of that 10-15 percent footprint that is not currently at twelve feet.

Structures within the MKARNS system are either dikes or revetments. By evaluating historical dredging records and new data, multidimensional models were created to determine river training structure needs, top elevations, lengths, and alignments, and resulting rock quantity estimates. A total of 112 structures will be constructed or modified throughout the MKARNS system (six revetments and 106 dikes). Twenty-three new structures will be constructed (18 in AR; 5 in OK), and 89 existing structures will be modified (84 in AR; five in OK) (Table 1). Maps depicting the location of each proposed river training structure are available in Appendix C. While 112 structures are planned as new or modified construction, this number may change in the future. As structures are implemented in phases, their effect on river conditions will be modified and the need and location of additional new or modified structures in the following phases will be revised accordingly. Moving forward, the USACE Project Development Team (PDT) will work closely with resource agencies including USFWS, AGFC, and ODWC to minimize impacts to aquatic resources resulting from training structure construction.

Table 1. Existing and proposed river training structures for the MKARNS 12-Foot Project. Visuals are available in Appendix C.

Name	Pool #	River Mile	Structure Type	State
D57.8L	2	36	Dike	AR
LH58.85L	2	38	Dike	AR
D58.92L	2	38	Dike	AR
LH59.00L	2	38	Dike	AR
D59.08L	2	38	Dike	AR
LH59.17L	2	38	Dike	AR
LH59.28L	2	38	Dike	AR
LH59.39L	2	38	Dike	AR
D59.50L	2	38	Dike	AR
LH59.60L	2	38	Dike	AR
LH62.97R	2	44	Dike	AR
D63.5R	2	44	Dike	AR
D63.7R	2	44	Dike	AR
D63.9R	2	44	Dike	AR
D64.1R	2	44	Dike	AR
D64.3R	2	44	Dike	AR
D64.5R	2	44	Dike	AR
D68.8R	2	46	Dike	AR
D68.6L	2	46	Dike	AR
D68.8L	2	46	Dike	AR
D70.78R	2	49	Dike	AR
D70.91R	2	49	Dike	AR
D71.03R	2	49	Dike	AR
D71.17R	2	49	Dike	AR
D71.37R	2	49	Dike	AR
D63.04R	2	44	Dike	AR
D63.15R	2	44	Dike	AR
R60.01L	2	38	Dike	AR
D59.60L	2	38	Dike	AR
R69.8R	2	46	Revetment	AR
R72.0L	2	49	Revetment	AR
D87.1L	3	65.4	Dike	AR
D86.8L	3	65.4	Dike	AR
D86.5L	3	65.4	Dike	AR
LH149.1L	5	102	Dike	AR
LH149.0L	5	102	Dike	AR
LH148.7L	5	102	Dike	AR
LH148.4L	5	102	Dike	AR
LH148.3L	5	102	Dike	AR
LH148.1L	5	102	Dike	AR

Name	Pool #	River Mile	Structure Type	State
NMD145.19L	7	146	Dike	AR
NMD145.55L	7	146	Dike	AR
D193.0L	7	147	Dike	AR
D192.6L	7	147	Dike	AR
D191.7L	7	146	Dike	AR
D191.4L	7	146	Dike	AR
D191.2L	7	146	Dike	AR
D188.7R	7	143	Dike	AR
D188.6R	7	143	Dike	AR
D188.4R	7	143	Dike	AR
D188.0R	7	143	Dike	AR
LH188.0R	7	143	Dike	AR
D211.2R	8	166	Dike	AR
D211.0R	8	166	Dike	AR
LH209.7L	8	164.5	Dike	AR
D209.4L	8	164.5	Dike	AR
D218.1L	8	169.5	Dike	AR
D217.4L	8	169.5	Dike	AR
D217.6L	8	169.5	Dike	AR
D217.7L	8	169.5	Dike	AR
D217.5L	8	169.5	Dike	AR
D217.3L	8	169.5	Dike	AR
R209.9L	8	164.5	Revetment	AR
R224.5R	8	175.6	Revetment	AR
NMR165.1R	8	164.5	Revetment	AR
NMR170.0R	8	169.5	Revetment	AR
D230.0R	9	182	Dike	AR
D229.7R	9	182	Dike	AR
D230.4R	9	182	Dike	AR
D288.4R	10	236	Dike	AR
D292.9L	10	240	Dike	AR
R293.7L	10	240	Dike	AR
D294.1R	10	242	Dike	AR
D294.3R	10	242	Dike	AR
D294.4R	10	242	Dike	AR
DNM223.0L	10	222	Dike	AR
DNM230.05R	10	230	Dike	AR
DNM237.7R	10	237.5	Dike	AR
D293.1L	10	240	Dike	AR
D293.7R	10	242	Dike	AR
DNM246.38R	10	246	Dike	AR
DNM237.5R	10	237.5	Dike	AR

Name	Pool #	River Mile	Structure Type	State
DNM238.2R	10	237.5	Dike	AR
D293.4L	10	240	Dike	AR
DNM249.25L	10	250	Dike	AR
DNM249.5L	10	250	Dike	AR
DNM249.75L	10	250	Dike	AR
D293.9R	10	242	Dike	AR
D333.9R	12	280	Dike	AR
D333.8R	12	280	Dike	AR
D327.6L	12	275	Dike	AR
D327.7R	12	275	Dike	AR
DNM284.1R	12	284	Dike	AR
DNM283.95R	12	284	Dike	AR
D337.0R	12	284	Dike	AR
DNM283.76R	12	284	Dike	AR
D336.9R	12	284	Dike	AR
DNM274.75R	12	275	Dike	AR
DNM274.60R	12	27	Dike	AR
D334.0R	12	280	Dike	AR
R334.3R	12	280	Revetment	AR
R337.5L	12	284	Revetment	AR
SBC-3-L	15	3.5 - 4.9	Dike	AR
SBC-2-L	15	3.5 - 4.9	Dike	AR
SBC-1-L	15	3.5 - 4.9	Dike	AR
D351.7L	15	352.7 - 356.3	Dike	OK
D350.5L	15	352.7 - 356.3	Dike	OK
D394.5R	16		Dike	OK
D394.4R	16		Dike	OK
D394.3R	16		Dike	OK
D394.2R	16		Dike	OK
D394.1R	16		Dike	OK

4.2 Proposed Dredge Locations

To reach a depth of 12 feet, mechanical and hydraulic dredging will be used to remove material throughout the river length where and when necessary. Mechanical and hydraulic dredging operations will take place in all areas where river training structures are unsuccessful or unable to maintain the required depth without dredging. The action does not include dredging outside the currently authorized navigation widths of 250 feet on the Arkansas River, 300 feet on the White River, 150 feet on the Verdigris River, and 225 feet on the Sans Bois. This includes tapering for the lock approaches. Dredging will be accomplished by two different mechanisms:

- Hydraulic dredging--Removal of loosely compacted materials by cutterheads,

dustpans, hoppers, hydraulic pipeline plain suction, and sidecasters.

- Mechanical dredging--Removal of loose or hard, compacted materials by clamshell, dipper, or ladder dredges (explosives may be required in a few locations to break up solid rock substrates).

While the 12-foot channel action has not changed, some dredging locations have changed since 2005 due to flooding events that changed the river condition (Table 2). An example of how river depth changed is shown in Figure 2. For a visual of dredge locations throughout the MKARNS system, see the MKARNS Map Book in Appendix C.

Table 2. Proposed dredge sites for the MKARNS 12-Foot Project. See Appendix C for mapped locations.

Location	2004 Proposed Dredge Sites	2023 Proposed Dredge Sites
Oklahoma	45	45
Arkansas	28	51
Total	**73**	**96**

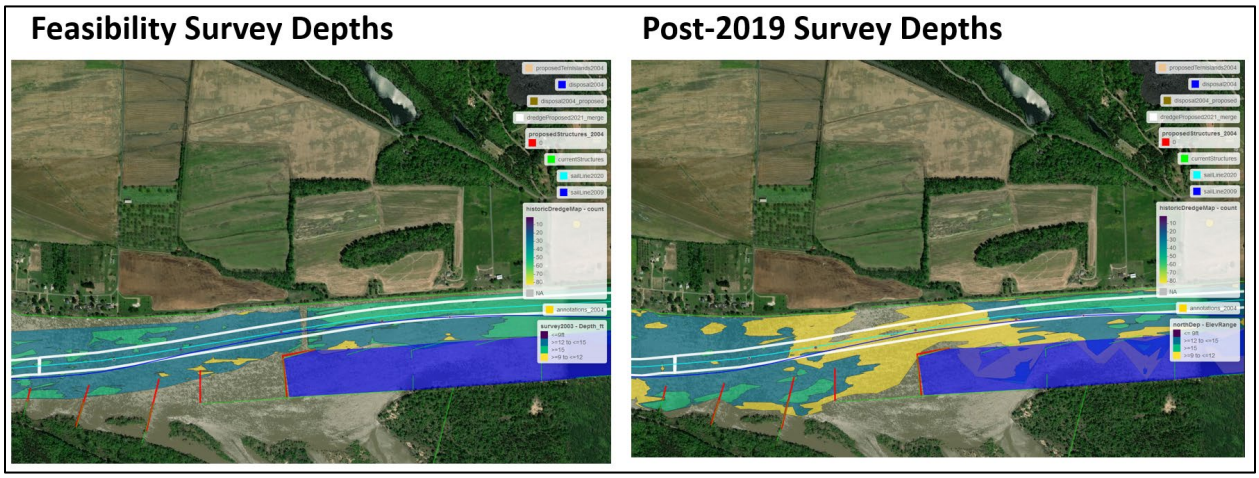

Figure 2. Arkansas River depth at Pool 7 during Feasibility vs post-2019 flood event.

While the MKARNS system will continue to change, the current dredging acreage anticipated at each proposed dredge site is listed in Table 3, with a total anticipated quantity of 5,791,099 M cubic yards (cy) across Arkansas and Oklahoma, a 46 percent (%) reduction from proposed quantities in the 2005 FR/EIS.

Table 3. Dredging quantities at each dredge location. Maps depicting location are in Appendix C.

Pool #	Volume CY[3]	Navigation Mile + Description	Area (Acres)
Arkansas Dredge Sites			
-1	18323	1 - Montgomery Point LD	8.06
0	122592	10 - Downstream Lock 1	28.36
0	217417	8	65.16
0	35974	4	9.15
0	0	5.4	6.69
0	0	4.7	5.36
1	102045	13 - Canal - Downstream Lock 2 - Upstream Lock 1	65.70
2	39740	50.2 Downstream Hardin LD 3	6.46
2	29931	49	9.75
2	61939	47-46	11.20
2	65471	45-43	11.03
2	28376	38-36	18.25
2	118101	24.5	15.43
2	519314	19 - Canal Entrance - Upstream Lock 2	165.09
3	121771	66 - Downstream Sanders LD 4	45.30
3	54555	62	15.36
4	15332	86.3 Downstream Maynard LD 5	7.11
4	7160	80-79	19.28
5	4580	108.1 Downstream Terry LD 6	4.46
5	78625	102	13.88
6	2299	125.3 - Downstream Murray LD7	8.17
7	15744	155.9 - Downstream Toad Suck LD8	4.11
7	199029	151 -149	66.24
7	253963	147-144	90.95
7	338242	143-140	81.87
8	17245	176.9 - Downstream Ormond LD9	4.89
8	59307	175.5	7.37
8	230334	169.5	38.28
8	14703	166	6.16
8	50559	165	20.43
8	0	167.9	8.95
8	0	165.9	1.73
9	49835	205.5 - Downstream Dardanelle LD10	22.28
9	15455	187	29.90
9	5293	185	22.49
9	25190	182	19.02
10	11528	256.8 - Downstream Ozark LD12	3.38
10	238267	249.8	40.46
10	61873	246	18.30

Pool #	Volume CY[3]	Navigation Mile + Description	Area (Acres)
10	75549	240.7	55.73
10	123473	237.5	33.33
10	5294	236	9.36
10	34112	230	19.84
10	187096	222	63.46
10	45651	225	12.35
12	33396	292.8 - Downstream Trimble LD13	22.84
12	54308	284	27.35
12	14537	280	25.88
12	63281	278	19.00
12	19529	275	9.00
12	199725	272	52.43
Oklahoma Dredge Sites			
13	162660	311.3-312.6	61.01
13	193532	314.2-315.4	43.78
13	220574	315.4-317.4	98.70
13	254918	317.4 - Lock 14	74.33
13	85931	Poteau 1.2-end	14.05
13	27572	Poteau 0.0-0.4	7.41
13	0	319.0-319.5	12.76
14	117639	334.0 - Lock 15	63.49
15	80837	337.7-338.8	85.84
15	16205	AC 0.0 - 0.3	15.97
15	162875	342.3-344.5	98.22
15	105312	346.5-347.4	38.52
15	317400	347.8-349.4	72.52
15	59646	355.4-356.4	43.18
15	58287	361.2-363.3	81.62
15	140373	363.9 - Lock 16	124.69
15	153326	Sallisaw Cr.	14.07
15	42839	Short Mtn	10.44
16	187090	Lock 16 - 367.6	33.51
16	182722	374.0-375.3	65.55
16	24403	379.1-379.9	52.24
16	122494	380.3-381.8	69.62
16	260569	382.9-384.4	85.10
16	223249	389.2-391.5	111.68
16	287630	391.5-393.4	92.92
16	176627	394.0-395.2	54.20
16	61859	395.2-398.0	102.89
16	282069	398.0-400.3	103.57
16	175789	400.3 - Lock 17	51.41

Pool #	Volume CY[3]	Navigation Mile + Description	Area (Acres)
16	51634	Boudinot	4.51
16	0	392.5-393	38.01
17	194572	Lock 17 - 403.3	60.48
17	35526	407.4-407.9	20.55
17	28636	414.1-414.5	10.30
17	56328	416.3-416.7	15.86
17	119214	418.4-420.0	53.43
17	140000	420.0-Lock 18	50.53
18	19530	Lock18-422.3	11.32
18	35880	427.5-427.9	12.54
18	58955	428.9-429.7	20.48
18	35549	433.4-434.5	38.53
18	50932	436.0-436.8	17.13
18	45838	440.0-441.6	61.12
18	55669	441.6-443.3	65.77
18	151029	443.3-end	74.93
Total Acreage			**3715.37**

4.3 Proposed Upland Disposal

Upland disposal is the placement of a dredged material into a secure area where sediment is physically contained. These sites are diked structures that have been built for the disposal of dredged material where in-water placement and beneficial use are not feasible or environmentally unacceptable. The size, shape, design and level of complexity of these facilities will vary widely depending on dredging quantities, methods of disposal, sediment contamination levels, state and local requirements and site characteristics.

For the MKARNS, the disposal sites are located on land as close as possible to areas along the navigation channel that are expected to require dredging. This will allow the dredged materials to be effectively piped directly from the barges and minimize pumping distances or the need for multiple booster pumps.

There are 39 upland disposal sites proposed for construction (Table 4). These sites have been identified to avoid natural or managed habitats to the greatest extent practicable. However, for those locations where adverse impacts cannot be avoided, compensatory mitigation will be implemented to alleviate impacts to forested and emergent wetlands. Additionally, there are pre-existing upland sites in AR and OK that may be utilized, depending on their proximity to dredge locations. These have not been included, as they have already undergone the NEPA process.

Table 4. Proposed upland disposal sites for the MKARNS 12-Foot Project.

Site Number	Permanently Disturbed Area (Acres)	Temporarily Disturbed Area (Acres)
Oklahoma		
0	8.15	76.16
1	13.71	14.57
2	37.40	110.73
6	37.35	134.80
7	31.81	16.51
10	21.47	44.51
11	55.03	12.10
12	16.25	65.27
13	11.19	144.24
14	9.85	62.91
15	13.55	129.28
16	8.01	51.16
18	29.99	78.55
20	11.27	49.83
21	11.58	30.30
22	12.62	74.04
24	9.45	10.54
27	24.74	27.92
28	43.04	56.63
29	23.82	72.14
30	7.64	24.59
32	17.06	29.95
34	15.09	13.72
35	6.38	32.13
37	5.54	34.56
38	7.81	18.53
39	6.26	32.51
40	25.53	146.04
41	12.04	94.62
ALT-4	16.51	15.29
18A	19.45	74.25
1a	22.11	115.18
31a	2.55	25.27
33A	6.47	69.14
36A	5.38	34.73
4A	4.45	4.45

Site Number	Permanently Disturbed Area (Acres)	Temporarily Disturbed Area (Acres)
ALT-20	12.89	86.19
Oklahoma Total	**666.45**	**1,699.51**
Arkansas		
13 R	70	48
16 L	72	7.5
Arkansas Total	**142**	**55.5**

Land cover classifications were conducted to determine how many acres of each land cover type will be permanently impacted at each new upland disposal site location using the National Land Cover Database (Figure 3). Permanent impacts will result in losses of open water, barren land, forested land, grassland, cropland, and wetlands (Table 5). Final acreages of habitat impacts will be determined once engineering designs are finalized. Prior to construction, field data will be collected at each site and analyzed via HEP analysis as described in Appendix E to this document to accurately determine mitigation needs.

Upland disposal sites constructed under the MKARNS 12-foot Channel project will follow all applicable engineering and environmental laws, regulations, policies, and USACE guidance to ensure structural stability and long-term maintenance. Engineer Regulation (ER) 1105-2-100 requires that USACE engages in dredged material management planning to “ensure that maintenance dredging activities are performed in an environmentally acceptable manner, use sound engineering techniques, are economically warranted, and that sufficient confined disposal facilities are available for at least the next 20 years.” Engineer Manual (EM) 1110-2-5025, “Dredging and Dredged Material Management,” outlines USACE dredging and dredged material management processes, including the “planning, designing, constructing, operating, and managing environmentally acceptable open-water and confined dredged material placement areas for long-term disposal needs.” Furthermore, all project actions and resulting impacts are subject to NEPA, FWCA, ESA and USACE policies related to environmental considerations and mitigation. USACE will investigate the cause of any unforeseen impacts to determine if further remedial action is necessary as required under NEPA and other applicable laws.

For detailed information on the proposed upland disposal site locations, see Appendix C.

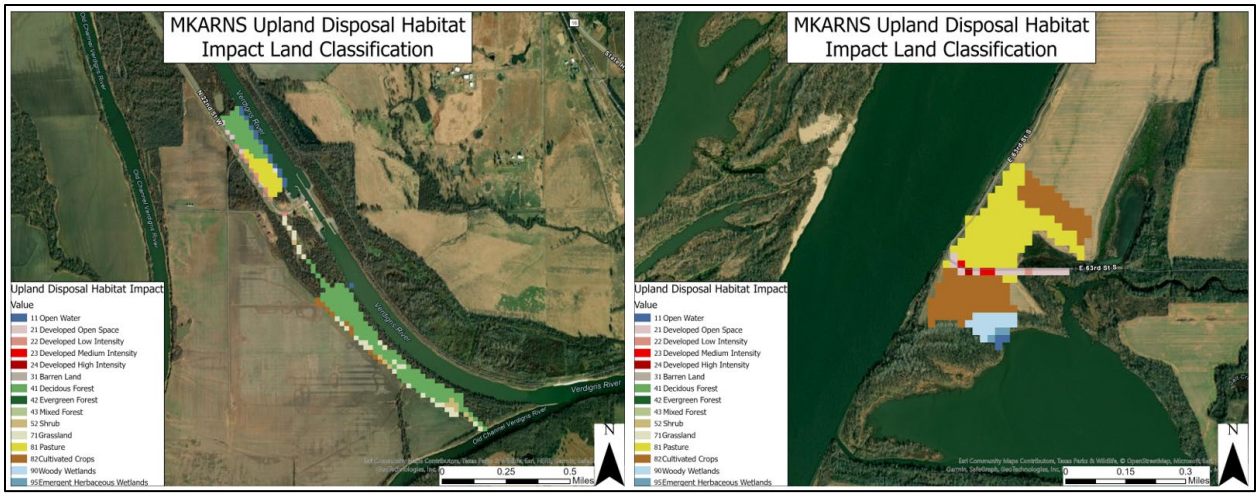

Figure 3. Examples of land cover classification for upland disposal sites. Classification used National Land Cover Database data.

Table 5. Land cover type and acreage potentially permanently impacted by upland disposal sites.

Land Cover Type	Acres Impacted
OKLAHOMA	
Open Water	31.13
Developed Open Space	12
Developed Low Intensity	12.45
Developed Medium Intensity	3.11
Developed High Intensity	0.66
Barren Land	4.45
Deciduous Forest	188.36
Evergreen Forest	0.67
Mixed Forest	1.11
Shrub	3.78
Grassland	24.9
Pasture	108.08
Cultivated Crops	183.91
Woody Wetlands	73.83
Emergent Herbaceous Wetlands	11.34
ARKANSAS	

Land Cover Type	Acres Impacted
Developed Open Space	8
Developed Low Intensity	1.78
Developed Medium Intensity	1.11
Developed High Intensity	0.22
Cultivated Crops	188.58
TOTAL	**859.52**

4.4 In-water Disposal Sites

Open water placement on the MKARNS involves the discharge of dredged material directly into the river. Hydraulically dredged material may be discharged by pipeline into the site while mechanically dredged material may be placed in bottom-dump barges or scows and towed to the disposal sites. Discharged dredged material settles through the water column and deposits on the bottom at the disposal site. The dredged material may remain in a mound at the site or disperse depending on the material's physical properties and the hydrodynamics of the disposal site.

All in-water disposal sites are located within Arkansas. This excludes sites that will be used for the creation of sandbar islands.

New sites have been selected based on proximity to the updated dredging locations. The quantity and area of the disposal sites are listed in Table 6, and maps of the locations can be found in Appendix C. While planned locations are identified, USACE is committed to working with resource agencies to refine in-water placement locations to avoid and minimize adverse impacts to turbidity and sedimentation to the greatest extent practical.

Table 6. Existing and proposed in-water disposal sites. All in-water disposal sites are proposed in the State of Arkansas.

	Quantity	Total Area (Acres)
Existing Disposal Sites	129	11,328.26
Proposed New Disposal Sites	41	1,280.01
Total	**170**	**12,608.27**

4.5 Beneficial Use of Dredge Material

Sandbar islands may be constructed near dredging locations, contingent on suitable site conditions. Thirty sites were identified in the 2005 FR/EIS and may remain viable if dredging is required near the sites. These locations are depicted in the maps in Appendix C and have not changed from those planned in the 2005 FR/EIS. Islands created with dredged material can provide quality stopover habitat during migration for

piping plover and red knots, which are both federally listed and protected species. Additionally, the USACE is committed to maintaining and monitoring these sandbar islands in support of interior least tern recovery, as this cooperation is in part a factor for the species downlisting under the ESA.

Periodic nourishment of islands is often needed every 3 to 7 years to maintain their size and appropriate seral stage and will be supported by maintenance dredging needs.

USACE is committed to collaborating with resource agencies to find the most beneficial means to utilize dredge material for habitat benefit. Future engagements will help to inform new or improved sandbar islands, as well as the potential use of dredge material to restore side channels to create sandbar islands.

5. Input and Coordination with State Fish and Wildlife Agencies

The USACE coordinated with state and federal agencies on the original 2005 document, and for this supplemental CAR. The FWCA applies to both the USFWS and the states and any coordination done between the USACE and the USFWS has been extended to the state wildlife agencies. Upon completion of this supplemental CAR, the USFWS, as well as the AGFC and ODWC will submit letters to be included in the supplemental documents. Coordination with the USFWS and the states for this supplemental CAR occurred as follows:

- June 2023: Informal coordination with AGFC during in-person meetings
- September 5, 2023: Contacted USFWS AR Field Office to discuss preferred formatting for the CAR
- November 3, 2023: Submitted Part 1 of draft CAR to USFWS to initiate review (Chapters 1-3)
- February 9, 2024: Submitted final draft CAR to USFWS
- February 15, 2024: MKARNS 12-ft Channel Supplemental EA Agency Kick-Off Meeting
- February 29, 2024, to present: Bi-weekly meetings hosted with resource agencies
- May 7, 2024: In-person meeting hosted in Little Rock with the AGFC and USFWS
- May 15, 2024: In-person meeting hosted in Tulsa with ODWC
- May 22, 2024: In-person meeting hosted in Tulsa with USFWS
- May 28, 2024: USACE received revisions on the Draft CAR from USFWS (AR, OK, and Water Resources Division) and AGFC
- June 3, 2024: USACE provided revised CAR back to agencies for final review
- June 12, 2024: USACE received final agency comments on draft CAR
- June 13, 2024: USACE provided Final CAR to USFWS and state agencies

6. Relevant Prior FWCA Reports

In accordance with the FWCA, the USFWS previously developed a CAR, and Planning Aid Letter for the 2005 ARNS study. The USFWS identified fish and wildlife resources, problems, and needs for the 2005 ARNS. (Appendix A of this document and Appendix C of the 2005 FR/FEIS)

7. Fish and Wildlife Resource Concerns and Planning Objectives

The overall planning objective for the USFWS is to conserve important fish and wildlife resources for the benefit of the American people, while facilitating balanced development. This goal is supported by the FWCA and other authorities. The FWCA establishes fish and wildlife conservation as a coequal purpose of water resource development projects, and states that fish and wildlife resources shall receive equal consideration with other features of water resource development programs.

Existing fish and wildlife resources are discussed in the Fish and Wildlife Resources Section (Chapter 9) of this document.

Previously mentioned fish and wildlife concerns are in Appendix A of this document.

8. Evaluation Method

Compensatory mitigation is required for unavoidable impacts to the environment that are caused by the recommended plan. USACE Civil Works policy, including ER 1105-5-412 and in the CECW-CP policy memorandum Policy Guidance on Certification on Ecosystem Output Models, dated August 13, 2008, requires that only habitat models already certified by the USACE Ecosystem Planning Center of Excellence (PCX) be used to determine mitigation, or that models proposed for use undergo the model certification process outlined by the USACE.

8.1 Ecological Model Selection

The 2005 FR/EIS and SEA used Habitat Evaluation Procedures (HEP) to quantify habitat values for the existing conditions and for the future with and without project scenarios. HEP was developed by the USFWS to quantify the impacts of habitat changes resulting from land or water development projects (USFWS 1980). HEP is based on suitability models that provide a quantitative description of the habitat requirements for a species or group of species. HEP models use measurements of appropriate variables to rate the habitat on a scale from 0.0 (unsuitable) to 1.0 (optimal).

Habitat quality is estimated using species models developed specifically for each habitat type. Each model consists of a 1) list of variables considered important in characterizing fish and wildlife habitats, 2) a Suitability Index graph for each variable, which defines the assumed relationship between habitat quality and different variable values, and 3) a mathematical formula that combines the Suitability Index for each variable into a single

value for habitat quality. The single value is referred to as the Habitat Suitability Index (HSI).

The Suitability Index graph is a graphic representation of how fish and wildlife habitat quality or “suitability” of a given habitat type is predicted to change as values of the given variable change. It also allows the model user to numerically describe, through the Suitability Index, the habitat quality of an area for any variable value. The Suitability Index ranges from 0.1 to 1.0, with 1.0 representing optimal condition for the variable in question.

After developing a Suitability Index, a mathematical formula is constructed that combines all Suitability Indices into a single HSI value. Because the Suitability Indices range from 0.1 to 1.0 the HSI also ranges from 0.1 to 1.0 and is a numerical representation of the overall or “composite” habitat quality of the evaluated habitat. The HSI formula defines the aggregation of Suitability Indices in a manner that is unique to each species depending on construction of the formula.

8.2 Habitat Suitability Index Models

8.2.1 Models

The 2005 FR/EIS utilized habitat models developed to evaluate the environmental impacts of the proposed dredging and flow changes on the MKARNS. These environmental impacts result from the disposal of dredge material on terrestrial habitats along the MKARNS and ecological benefits resulting from the proposed mitigation. The model methodology is based on the Habitat Evaluation Procedure (HEP). Appendix C-5 of the 2005 EIS – “Terrestrial Habitat Evaluation Procedures” provides a detailed explanation of how habitat suitability index models for bottomland hardwood forests, upland forests, grasslands, and marsh/wetland habitats were developed and used to evaluate habitat impacts from the development of 37 proposed upland dredge disposal sites in Oklahoma.

The USACE utilizes the mitigation planning process described in ER 1105-2-100 to determine compensation for non-negligible impacts to significant aquatic, terrestrial, and human resources to the maximum extent practicable and to ensure the recommended project will not have more than negligible impacts on those resources. Pursuant to that policy, the USACE does not consider upland forests and grasslands to be significant resources, thus they contend that mitigation for those resources is not allowable. The USFWS disagrees with this generalization of upland forests and grasslands as “insignificant”. On the contrary, any losses of upland forests or grasslands that fall within lands managed as National Wildlife Refuges or State management areas should be considered as significant resources worthy of compensation when avoidance is not possible. This is especially true for lands set aside as mitigation for the original MKARNS project. Other public or private lands may also contain rare habitats or habitats that support rare or federally listed species. The USFWS also considers these habitats to be significant. Early consultation with the USFWS and states to identify and

avoid these habitats or develop appropriate compensation for unavoidable losses is critical.

To evaluate habitat impacts and required mitigation for the MKARNS 12-foot Channel Project, the USACE used the Bottomland Hardwood Forest and Marsh models employed in the 2005 EIS to evaluate habitat impacts and required mitigation to bottomland hardwood forests and emergent wetlands (primarily shallow backwater habitats) from the proposed construction of 39 new upland disposal sites (OK – 37; AR – 2).

As discussed previously, USACE Civil Works policy requires that only standard habitat models already certified by the USACE Ecosystem Planning Center of Excellence (PCX) be used to determine mitigation, or that models proposed for use undergo the model certification process outlined by the USACE. As the habitat models developed and utilized for the 2005 EIS were not certified, USACE staff convened a team of biologists from the USFWS, the ODWC, and the AGFC, to review the Bottomland Hardwood Forest and Marsh models used for the 2005 EIS to determine their continued applicability for evaluating newly proposed upland disposal sites in Arkansas and Oklahoma. A meeting was held in Ft. Smith, Arkansas on May 3, 2023, to review the terrestrial model metrics. The team agreed that the existing models were still applicable, with two minor modifications to increase the scores for willows and lotus in the Marsh model. After this meeting and minor model revisions, the Bottomland Hardwood Forest and Marsh models were submitted to the USACE Ecosystem Restoration Planning Center of Expertise (Eco-PCX) on July 3, 2023, for model certification.

Single Use Approval for the use of the Bottomland Hardwood Forest and Marsh MKARNS HSI models was received on August 11, 2023, and is effective thru August 10, 2030. To evaluate gravel bed impacts, the Paddlefish Habitat Evaluation Procedures (HEP) model was used as a surrogate due to its reliance on the presence of this habitat to support reproductive life history activities. The Paddlefish model workbook from the PCX library of approved models was used without modification, thus no review/approval of model documentation was required. These models were used to assess and quantify habitat and appropriate mitigation to offset the impacts.

Habitat specific HSI scores were generated for using the habitat- specific spreadsheet calculators. The HSI scores were then multiplied by acreages to calculate the Habitat Units (HUs). These HUs represent a numerical combination of quality (i.e., Habitat Suitability Index) and quantity (acres) existing at any given point in time. HUs represent a single point in time; however, the impacts of any of the proposed actions would occur over the entire planning horizon (50 years).

To account for the value of change over time, when HSI scores are not available for each year of analysis, the cumulative HUs are calculated using a formula that requires

$$\int_0^T HU\ dt = (T_2 - T_1)\left[\left(\frac{A_1H_1 + A_2H_2}{3}\right) + \left(\frac{A_2H_1 + A_1H_2}{6}\right)\right]$$

only the target year (TY) and the area estimates (USFWS 1980). The following formula was used:

Where:

T1= first target year of time interval T2 = last target year of time interval 6
A1 = area of available habitat at beginning of time interval A2= area of available habitat as the end of time interval
H1 = Habitat Suitability Index at the beginning of time interval H2 = Habitat Suitability Index at the end of time interval
3 and 6 = constants derived from integration of HSI x Area for the interval between any two target years

This formula was developed to precisely calculate cumulative HUs when either HSI or area or both change over a time interval, which is common when dealing with the unevenness found in nature. HU gains or losses are annualized by summing the cumulative HUs calculated using the above equation across all target years in the period of analysis and dividing the total (cumulative HUs [CHU]) by the number of years in the planning horizon (i.e., 50 years). This calculation results in the Average Annual Habitat Units (AAHUs).

For additional details on Habitat Suitability Index Models used, see chapter 2 of the Mitigation, Monitoring, and Adaptive Management Plan (Appendix E).

8.2.1.1 *Bottomland Hardwood Forest Habitat Suitability Index*

The bottomland hardwood forest model utilizes two major components to evaluate the quality of this habitat type:

1. Biota component of a forest community, and
2. Landscape component of a forest community.

Within each component, five variables (V) were measured for evaluation purposes:

<u>Biota Component of Forest Community</u>

V1: CANHMAST – mean proportion of tree canopy comprised of hard mast species.

V2: CANTREE - mean percentage of overstory canopy resulting from trees.

V3: DBHTREE - mean diameter of a tree at breast height.

V4: NUMTREESP - count of tree species identified in the sampling area.

V5: VEGSTRATA - count of vegetation strata encountered using the following categories: herbaceous, shrub, midstory tree canopy, overstory tree canopy,

vines, duff/twigs/leaf litter, coarse woody debris, snags, and microrelief.

Landscape Component of Forest Community

V6: ADJLANDUSE - land use type for the area adjacent to the sampling points.

V7: CORE - proportion of the sampling area that is represented by the core cover type.

V8: DISTOPW - average distance to open water measured in meters.

V9: NEIGHBOR - distance to the nearest neighbor of similar cover type measured in meters.

V10: PATCHSIZE - size of the sampling area polygon for each cover type measured in acres.

Model Assumptions

Biota of Forest Community

For the Biota of the Forest Community (FBIOTA) life requisite, the Tree Canopy (CANTREE) is an important indication of cover type. The Hard Mast Canopy Cover (CANHMAST) metric was added to capture the diversity and food source conditions. The dbh metric (DBHTREE) was included to capture the age of the stand which also affects the mast production (i.e., succession/sustainability and food availability). The number of tree species (NUMTREESP) metric captures the diversity of the stand. The vegetation strata (VEGSTRATA) metric was included to capture the architecture of the community – herbaceous layer up through the multi-tiered canopies. Both diversity and structure must be present and optimal to achieve a score of 1.0. Shortcomings of one element can be offset (compensated for) by the other. One element can be entirely absent, but suitability can still be achieved with regards to the remaining element. The resulting FBIOTA equation is:

$$FBIOTA = \frac{\frac{\sqrt{V_{CANTREE} \times V_{CANHMAST}} + V_{NUMTREESP}}{2} + \frac{V_{DBHTREE} + V_{VEGSTRATA}}{2}}{2}$$

Landscape component of the Forest Community

The Landscape of the Forest Community (FLANDSCAPE) life requisite evaluates the size of the forest community patch (PATCHSIZE). In addition, the edge (EDGE) and core size (CORE) are weighted against the patch size. Other weighting factors include adjacent land use (ADJLANDUSE), and where the nearest “like” neighbor is (NEIGHBOR), and how far away the nearest open water habitat is located (DISTOPW). Both patch characteristics and outside influences on the system must be optimal to achieve a score of 1.0. Shortcomings of one element cannot be offset (compensated

for) by the other element. Rather, each element can weigh down the overall score. If one element is absent (or significantly detrimental), suitability is entirely lost. The resulting FLANDSCAPE equation is:

$$FLANDSCAPE = \sqrt{V_{PATCH} \times \sqrt{V_{CORE} \times V_{EDGE}}} \times \left(\frac{V_{ADJLANDUSE} + V_{DISTOPW} + V_{NEIGHBOR}}{3}\right)$$

The MKARNS 12-foot deepening project continues to be refined in both specific dredging location and quantities and corresponding upland placement location and sizes. Several assumptions were made to account for unknowns in the final location and size of anticipated impacts that conservatively overestimate existing or future without project (FWOP) habitat value, as well as overall impacts. The actual impacts are anticipated to be less than those presented in the modeling efforts. The impacts and associated mitigation plan likely represent a worst-case scenario with final mitigation plans subject to refinement as more detailed designs are completed.

Impact acreage was determined by assuming the project will have adverse effects to all habitat located within the upland disposal site permanent impact footprint. Habitats impacted from temporary construction areas (i.e., laydown areas, temporary roads, etc.) would be allowed to reestablish after completion of upland disposal sites, thus mitigation for these temporary impacts was not necessary as long as those impacts are to insignificant habitats (i.e., disturbed pastures) and short-term (i.e., less than 1 year to recovery).

The following list depicts habitat modeling metric assumption for the 3 separate habitat condition scenarios. The FWOP, Future With Project (FWP), and FWP on mitigation lands habitat conditions. Assumptions made for each metric, and conditions that were expected to persist in the future are listed below:

<u>Biota Component of Forest Community</u>

V1: CANHMAST – For FWOP, assumed best case scenario for all forested areas. For FWP, assumed total loss of forested areas. For FWP on mitigation lands, assumed no mast production until 25 years after plantings to allow for trees to mature.

V2; CANTREE - For FWOP, assumed best case scenario for all forested areas. For FWP, assumed total loss of forested areas, For FWP on mitigation lands, assumed no minimum canopy cover until 25 years after plantings.

V3: DBHTREE - For FWOP, assumed best case scenario for all forested areas. For FWP, assumed total loss of forested areas, For FWP on mitigation lands, assumed minimal dbh growth until 25 years after plantings.

V4: NUMTREESP - For FWOP, assumed nearly best-case scenario for all forested areas based on info in 2005 EIS. For FWP, assumed total loss of forested areas, For FWP on mitigation lands, assumed no trees meeting dbh criteria until 25 years after plantings.

V5: VEGSTRATA - For FWOP, assumed similar conditions for all forested areas based on info in 2005 EIS. For FWP, assumed total loss of forested areas, For FWP on mitigation lands, assumed habitat strata, particularly mid and overstory, isn't formed until 25 years after plantings.

Landscape Component of Forest Community

V6: ADJLANDUSE – all conditions assume pasturelands are nearest neighbor although ag/croplands may be more likely in several areas.

V7: CORE – FWOP assumed 20 acres based on 2005 EIS information although actual field conditions and habitat fragmentation, are likely to exhibit smaller core areas. FWP assumed complete loss of CORE. FWP on mitigation lands assumed no increase in habitat until 25 years after plantings.

V8: DISTOPW – all conditions assumed water was within 200 meters due to the habitat type's dependency on water.

V9: NEIGHBOR - all conditions assumed nearest neighbor was within 600 meters due to the patchy nature of bottomland hardwood forest along the riverbanks.

V10: PATCHSIZE – average patch size impacted was assumed to be 100 acres for all conditions as a worst-case scenario for impacts and targeted size of mitigation lands.

Bottomland HSI

The resulting HSI for the bottomland hardwood forest is the mean of the FBIOTA and FLANDSCAPE life requisite suitability indices:

$$Forest\ HSI = \frac{FBIOTA + FLANDSCAPE}{2}$$

8.2.1.2 *Bottomland Hardwood Forest Modeling*

Existing/Future-Without Project Conditions

Bottomland Hardwood Forest (BLHF) brackets the Arkansas River throughout the study area excluding river front communities and infrastructure. However, the width the of BLHF corridor on either side can vary dramatically due to adjacent land uses. Pasture and agriculture use generally dominates the landscape based on cursory aerial imagery surveys. Table 7 shows BLHF habitat model outputs assuming BLHF habitat conditions

described in 2005 EIS have persisted into the future producing 45 AAHUs across 74 acres that may be impacted from the construction of upland placement of dredged material.

Target years (TY) of 0, 1, 5, 25, and 50 were utilized to annualize habitat changes over time. Years 0, 1, and 50 were based on the start of a project, one year after construction begins, and 50-year planning horizon of projects. Year 5 was selected to early forest development, or lack thereof, while Year 25 was selected due to it's the likely earliest period where substantial forest development in terms of mast production and canopy cover can be expected.

Table 7. Future-Without Project Conditions

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
BLHF	0	74	0.61	45.14		
	1	74	0.61	45.14	45.14	
	5	74	0.61	45.14	180.56	
	25	74	0.61	45.14	902.80	
	50	74	0.61	45.14	1128.50	**45**

Future-With Project Conditions

Table 8 below assumes a complete loss of the 74 acres of BLHF resulting from upland disposal site construction and associated activities of dredged material being placed there. This is expected to be the worst-case scenario. The project design continues to be refined and get smaller in footprint. The results indicate a loss of 45 AAHUs between the FWOP and FWP conditions. Thus, compensatory mitigation for BLHF is required.

Table 8. Future-With Project Conditions: Upland Disposal Sites Utilized

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
BLHF	0	0	0.00	0.00		
	1	0	0.00	0.00	0.00	
	5	0	0.00	0.00	0.00	
	25	0	0.00	0.00	0.00	
	50	0	0.00	0.00	0.00	**0**

Bottomland Hardwood Forest Mitigation

Ideally, a single large tract of land with minimal habitat presence, such as pasture or agriculture/crop lands, would identify with suitable hydrological connectivity to support BLHF. Table 9 and Table 10 demonstrate the need for 135 acres of land to be planted and managed for BLHF in order to produce the needed 45 AAHUs of BLHF to offset the loss of 74 acres of BLHF. The larger acreage needed is driven by the long maturation time of forest growth with habitat output. BLHF habitat output is not anticipated to occur for 25 years post planting.

Table 9. Future-Without Project Conditions: Agriculture/Barren/Non-Forested Area

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
BLHF	0	135	0.02	2.70		
	1	135	0.02	2.70	2.70	
	5	135	0.02	2.70	10.80	
	25	135	0.02	2.70	54.00	
	50	135	0.02	2.70	67.50	**3**

Table 10 shows habitat modeling that assumes small, bare root trees planted in high densities would, after 25 years, begin to produce mast, considerable canopy cover, and multiple layers of habitat from overstory, mid-story, and shrub and herbaceous ground cover.

Table 10. Future-With Project Conditions: Planting Bare Root Trees for BLHF

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
BLHF	0	135	0.02	2.70		
	1	135	0.02	2.70	2.70	
	5	135	0.02	2.70	10.80	
	25	135	0.48	64.80	675.00	
	50	135	0.52	70.20	1,687.50	**48**

8.2.2 Aquatic Models

To update the 2005 aquatic habitat modeling efforts into USACE-certified models, the ECO-PCX certified marsh models were utilized. While it is referred to as the “marsh

model," marsh, wetland, shallow backwater habitat, and emergent wetlands were considered synonymous descriptions of the targeted habitat. Data collected and agency expertise noted in the previous 2005 EIS modeling efforts as well as current aerial imagery were used to inform model metrics. It is important to note that all assumptions and strategies employed in this process are conservative and favor overestimating adverse impacts and the mitigation efforts required. Impacts to natural resources are anticipated to lessen as designs are further refined, therefore this mitigation plan likely presents a worst-case scenario. As final design and construction efforts are underway, the mitigation plan would be executed commensurate with actual impacts.

8.2.2.1 *Marsh Habitat Suitability Index*

Similar to the bottomland hardwood forest model, the Marsh HSI utilizes two major components to evaluate the quality of this habitat type: Biota Component of a Marsh Community, and Landscape Component of a Marsh Community.

The following variables contribute to each component.

Biota Component of a Marsh Community

V1: CANEMERG - percent emergent herbaceous vegetative canopy cover.

V2: CANWOOD6 - percent canopy cover of woody vegetation that is less than 6-m in height.

V3: DEPTHWATER - average water depth measured in cm.

V4: DIVERSVEG - identifies the indicator species of the marsh. The indicator species categories are 1) cattails, cordgrasses, bulrushes; 2) bluejoint reedgrass, reed canary-grass, sedges; 3) buttonbush, mangrove; and 4) other growth form not listed.

V5: REGIME - identifies the hydrologic regime of the marsh cover type sampling area. Using the Cowardin Classification System, the predominant hydrologic regime is documented for the site. The Cowardin Classification System categories are permanently flooded, intermittently exposed, semi permanently flooded, seasonally flooded, temporarily flooded, saturated, and intermittently flooded.

Landscape Component of a Marsh Community

V6: ADJLANDUSE - identifies the land use type for the area adjacent to the sampling points (pristine/uninhabited areas, parks, pasture lands, utility rights-of-way and railroads, dirt and gravel roads/oil and gas fields, agricultural croplands, residential and golf courses, paved roads/highways, and commercial/industrial areas).

V7: NEIGHBOR - measure of the distance to the nearest neighbor of similar cover type measured in meters.

V8: PATCHSIZE - size of the sampling area polygon for each cover type measured in acres.

Model Assumptions

Biota Component for the Marsh Community

The Biota Component for the Marsh Community (MBIOTA) is comprised of four main and equally important metrics: the emergent species present (DIVERSVEG), the emergent canopy cover (CANEMERG), the depth of the water (DEPTHWATER), and the timing and duration of the water (REGIME). These factors are weighted down by the percent of woody vegetation (CANWOOD6). Diversity, cover, and water must be optimal to achieve a score of 1.0. Shortcomings can be offset (compensated for) by the other variables. The overall score is weighted down by the competition of woody vegetation overtaking the marsh. The equation for the MBIOTA life requisite is:

$$MBIOTA = \frac{V_{DIVERSVEG} + V_{CANEMERG} + V_{DEPTHWATER} + V_{REGIME}}{4} \times V_{CANWOOD6}$$

As mentioned above, information and agency expertise identified in the 2005 EIS was used to inform the USACE-certified Marsh HSI metrics. Because the dredged material placement areas and river training structure exact locations are still being designed and located, the assumption was made that aquatic habitat value and acreage impacted would be greater than what is expected to occur. The following list depicts the FWOP condition biota assumptions made for each metric, and these conditions were expected to persist in the future.

V1: DIVERSVEG: Smartweed, millet, sedges, and barnyard grass species were selected based on the assumption that the riverbank, side channel, and adjacent habitats have native emergent wetland habitat.

V2: CANEMERG: Emergent vegetation cover of 50% was selected in alignment with the assumption made in the metric above.

V3: DEPTHWATER: Average water depth of 20 centimeters was assumed due to its ability to support aquatic vegetation and within the optimum water depths for emergent habitat.

V4: REGIME: Regime was assumed to be intermittently exposed as it, at a minimum, accurately depicts the range of flood stage to low water drought conditions experienced within the system.

V5: CANWOOD6: A woody vegetation cover of 20% was assumed due to proximity to adjacent banks and other island or river training structure features.

Landscape Component for the Marsh Community

The Landscape Component of the Marsh Community (MLANDSCAPE) consists of the patch size (PATCHSIZE) and influenced by the distance to the nearest like cover type (NEIGHBOR). These factors are weighted by the degree of disturbance from the

adjacent land uses (ADJLANDUSE). Both the patch characteristics and the outside influences on the system must be optimal to score a 1.0. Shortcomings of one element cannot be offset or compensated by another element. Rather, each element can weigh down the overall score. If one element is absent or significantly detrimental, the suitability is entirely lost. The equation for the MLANDSCAPE life requisite is:

$$MLANDSCAPE = V_{PATCHSIZE} \times \frac{V_{ADJLANDUSE} + V_{NEIGHBOR}}{2}$$

The following list depicts the FWOP landscape condition assumptions made for each metric, and these conditions were expected to persist in the future.

> V6: ADJLANDUSE: Pasture lands assumed based on current aerial imagery, although a large portion may in fact be agricultural lands.
> V7: NEIGHBOR: Nearest marsh habitat assumed to be 200 yards based on aerial imagery.
> V8: PATCHSIZE: Patch sizes vary throughout the system from a few acres to hundreds of acres within potential impact areas, but 35 acres was selected as it was assumed larger patches of habitat would be impacted therefore this was the conservative estimate.

Marsh HSI
The resulting HSI for the marsh community is the mean of the MBIOTA and MLANDSCAPE life requisite suitability indices:

$$Marsh\ HSI = \frac{MBIOTA + MLANDSCAPE}{2}$$

8.2.2.2 *Aquatic Habitat Modeling*

The 2005 FR/EIS utilized habitat models that were developed to evaluate the environmental impacts of increasing the depth of the Arkansas River navigation channel from 9 to 12 feet. Field studies were conducted to establish baseline conditions of fish and aquatic habitat during the 2005 efforts. In addition, primary impacts of the project identified by an interagency team of biologists and engineers were evaluated including dike filling rates and associated effects on habitat quality, and the potential of degrading or removing gravel during dredging activities. The model methodology used in the 2005 FR/EIS was based on HEP. Appendix C-6 of the 2005 EIS – “Aquatic Habitat Evaluation Procedures” provides a detailed explanation of how habitat suitability index models were developed for impacts to aquatic resources.

As the model developed and utilized in the 2005 EIS was not certified, the USACE used the Marsh HSI, which was approved on August 11, 2023, for single use and effective through August 10, 2030, to model marsh or wetland mitigation needs. For the modeling

efforts, marsh, wetlands, shallow backwater habitat, emergent wetlands were considered synonymous descriptions of the targeted habitat.

Existing/Future-Without Project Conditions

The amount of dredging and placement, as well as the number and location of river training structures is still undergoing refinement. However, it is expected that refinements will result in fewer actual adverse impacts. Therefore, this modeling effort utilized the same level of acreage impacts to aquatic habitat as the 2005 modelling efforts as it would represent more impacts than what are expected to occur. Table 11 shows 4,974 acres of aquatic habitat that is anticipated to be impacted. Based on the Marsh HSI models, the FWOP habitat value was 0.76. Target years (TY) of 0, 1, 5, 25, and 50 were utilized to annualize habitat changes over time. Years 0, 1, and 50 were based on the start of a project, one year after construction begins, and 50-year planning horizon of projects. Year 5 was selected due to marsh habitat's ability to quickly mature relative to other habitat types. Year 25 was selected based on the 2005 EIS efforts demonstrating rates of deposition within dike fields.

Table 11. Future-Without Project Conditions

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
MARSH	0	4,974	0.76	3,780.24		
	1	4,974	0.76	3,780.24	3,780.24	
	5	4,974	0.76	3,780.24	15,120.96	
	25	4,974	0.76	3,780.24	75,604.80	
	50	4,974	0.76	3,780.24	94,506.00	**3,780**

Future-With Project Conditions

The same habitat metric assumptions from the FWOP were applied to the FWP aquatic habitat modeling, thus the same habitat value of 0.76 was anticipated to persist into the FWP. However, in 2005, the interagency team and engineers identified deposition rates within the dike fields (Table 12). Using this information, it was assumed that as the percentage of dike field filled with sediment, aquatic habitat acreage would be reduced. For example, an unnotched dike field would fill to 76% capacity over a period of 50 years, while a notched dike field would fill to 38% capacity over the same timeframe. Therefore, it was assumed that if the dike field filled to 76% capacity, a like percentage of aquatic habitat would be lost, and this was reflected in the FWP aquatic acres. The result was a loss of 2,416 AAHUs, or 3,781 acres, over a 50-year period (Table 13).

Table 12. Conversion of Estimated Fill Rates of Dike Fields to Filling Coefficients Used to Annualize HSI Values Over Project Life

	Maintain 9-ft Channel	Dredge 12-ft Channel
Percent full at 50 years	43%	76%
Percent full at 50 years (notched dikes/revetments)	21.5%	38%
Percent full at 25 years	21.5%	38%
Percent full at 25 years (notched dikes/revetments)	10.75%	19%

Table 13. Future-With Project Conditions: Aquatic Disposal with No New Dike Notches

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
MARSH	0	4,974	0.76	3,780.24		
	1	4,974	0.76	3,780.24	3,780.24	
	5	4,974	0.76	3,780.24	15,120.96	
	25	3,084	0.76	2,343.75	61,239.89	
	50	1,194	0.76	907.26	40,637.58	**2,416**

Aquatic Mitigation

Due to the loss of shallow backwater fisheries habitat within dike fields, compensatory mitigation would be required. To determine mitigation requirements, the same modeling process was utilized to calculate necessary acreage that would be required to offset the 1,365 AAHUs lost. Aquatic mitigation efforts would involve notching existing dikes to allow return of flow, scour, and aquatic vegetation, and river connectivity, and prevent accretion and associated conversion of aquatic habitat to terrestrial or forested habitat. Although the notches implemented with the FWP slow the rate of dike field filling, wetland acreage is still expected to decrease over the life of the project. However, as water flows through the notched dikes, over time the habitat value is anticipated to increase as productive habitat conditions develop.

The ideal location to implement the notching and reopening mitigation measures would be existing dike fields that have lost all backwater habitat due to sedimentation and when mitigation features are constructed, exhibits an HSI of 0.76. However, as a conservative approach to habitat mitigation requirements, the habitat model metrics assumed mitigation would occur on lands with existing habitat that is anticipated to lose habitat value over time as water flow is restricted by existing accretion process. The accretion would also be expected to produce a loss of shallow backwater acreage at the aforementioned rate by TY25 and TY50. Table 14 below depicts the FWOP conditions of a dike field to be notched and reopened for shallow backwater mitigation.

Table 14. Future-Without Project Conditions: Low Quality/Non-Wetland Habitat

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
MARSH	0	5,854	0.76	4,449.04		
	1	5,854	0.67	3,922.18	4,185.61	
	5	5,854	0.64	3,746.56	15,337.48	
	25	3,629	0.50	1,814.74	54,574.89	
	50	1,405	0.47	660.33	30,660.33	**2,095**

The FWP conditions followed the same assumptions as previous. Aquatic habitat acreage is expected to decrease as sediment fills in the dike fields at the rates identified in Table 14 above by TY25 and TY50. Some habitat value improvement can be realized by improving the hydrologic regime via dike notching and targeted re-opening of tributary and backwater flow. Marsh HSI metrics “DIVERSVEG,” “REGIME”, and “DEPTHWATER” improvements are expected over time, resulting in an increased habitat value from 0.47 to 0.76 after 50 years.

Opportunities to notch existing dikes and remove sediment from filled in backwaters and tributaries are abundant throughout the MKARNS. The 2005 EIS identified numerous locations that can be reconnected to the Arkansas River flow regime to restore shallow backwater habitats. Future agency coordination efforts would refine that list to identify the most appropriate sequence of sites that avoid and minimize adverse impacts to recreation, navigation, and adjacent non- aquatic lands while maximizing aquatic habitat output and success. Throughout the MKARNS, a total of 2,225 acres would need to be restored through the above mitigation efforts to offset the loss of 1,365 AAHUs throughout the 50-year project life. This was demonstrated in the habitat models through the dike notching and opening of previously sedimented-in waterways utilizing the same dike field filling in rates from the 2005 EIS. As more backwater areas are restored, future efforts would document habitat acreage and output to ensure the mitigation need is met. Future efforts also include inspecting any previously constructed mitigation features to assess their current outputs. If viable and constructed for the purpose of mitigating for MKARNS channel deepening, their outputs would count towards the mitigation need.

The USACE anticipates that dike notching, reconnecting of aquatic habitat to river flow, and a combination of wetland restoration and creation would restore 2,225 acres and fulfill the aquatic mitigation need, see Table 15 below.

Table 15. Future-With Project Conditions: Dike Notching

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
MARSH	0	5,854	0.76	4,449.04		
	1	5,854	0.67	3,922.18	4,185.61	
	5	5,854	0.64	3,746.56	15,337.48	
	25	4,742	0.76	3,603.72	73,947.73	
	50	3,629	0.76	2,758.40	79,526.59	**3,460**

8.2.3 Gravel Bar Models

To update the 2005 gravel bar habitat modeling efforts into USACE-certified models, the ECO-PCX certified Paddlefish HSI models were utilized. Paddlefish are native to the Arkansas River system, highly migratory, and prefer deep water habitat to winter in. Paddlefish migrate upstream to spawn over gravel and cobble substrates. Because of this preference for gravel bars as spawning habitats, the ECO-PCX certified Paddlefish HEP Reproductive Habitat model will be used as a surrogate to model impacts to gravel bars resulting from dredging efforts.

Data collected and agency expertise noted in the previous modeling efforts were used to inform model metrics. It is important to note that all assumptions and strategies employed in this process are conservative and favor overestimating the mitigation efforts required. As previously stated, impacts to natural resources are anticipated to lessen as dredging locations and quantities are further refined, therefore this mitigation plan likely presents a worst-case scenario regarding impacts to gravel bars. As final design and construction efforts are underway, the mitigation plan will be executed commensurate with actual impacts.

8.2.3.1 *Paddlefish Habitat Suitability Index*

The paddlefish reproductive habitat HSI formula focuses on the following individual life requisite suitability variables (V#):

<u>Reproduction Life Requisite Suitability Variables</u>

V1: Yearly frequency of at least a 21-day period of rising water temperatures between 10 to 17 degrees (°) Celsius (C).
V2: Yearly frequency of spring access to upstream spawning river (>40m wide and 1m deep).
V3: Accessible area of gravel and cobble substrate (>80% of 15–100-millimeter diameter) in spawning river within 200 kilometers of winter habitat.
V4: Average magnitude of spring water rise/average midwinter flow for a period exceeding 10 days with water temperatures 10-17°C.
V5: Average current velocity (0.3 meters above substrate over potential spawning substrate) during spring water rise.

V6: Minimum dissolved oxygen (DO) in potential spawning areas while water temperatures are 10-17°C.

Assumptions

As with the aquatic and terrestrial HSI models, information and agency expertise identified in the 2005 EIS was used to inform the USACE-certified Paddlefish HSI metrics. Because the dredged material placement areas and river training structure exact locations are still being designed and located, the assumption was made that gravel bar habitat acreage impacted would be greater than what is expected to occur. It was assumed that all water regime and quality metrics were optimal as paddlefish naturally occur in this system. However, V3, which measures availability of gravel bars in the paddlefish model, was used as the primary metric to capture impacts to gravel bars in the MKARNS system. The estimated 165 acres of gravel bars as identified in the 2005 modeling efforts through aerial imagery and surveying are conservatively assumed to remain the area impacted.

The following list depicts the FWOP condition reproduction life requisite assumptions made for each metric, and these conditions were expected to persist in the future.

V1: Yearly frequency of 0.45 of at least a 21-day period of rising water between 10-17°C. It was assumed that because paddlefish utilize the Arkansas River, water temperature fluctuations are suitable for habitat and reproduction, therefore a value maximizing this metric was selected.
V2: Yearly frequency of 0.45 of spring access to upstream spawning river. Because the Arkansas River is such a large system fed by many streams and other rivers, access to suitable upstream spawning habitat is expected, therefore the V2 metric was set to a maximum value.
V3: 66 hectares of accessible area of gravel and cobble substrate in spawning river within 200 kilometers of winter habitat. This number was derived from the 165 acres estimated in the 2005 modeling efforts.
V4: Average magnitude of 3 meters of spring water rise/average midwinter flow for a period exceeding 10 days with water temperature of 10-17°C. The Arkansas River seasonal water level variability is expected to be suitable for paddlefish, therefore this metric was set to a maximum value.
V5: Average current velocity of 0.4 meters per second during spring water rise. For the purpose of gravel bars, the Arkansas River is a large system fed by many other systems. Spring brings lots of rain, and flows are not a limiting factor for gravel bar availability, therefore the maximum value of the metric was assumed.
V6: Minimum DO of 6 mg/l assumed in potential spawning areas while water temperatures are 10-17°C as the water quality of the Arkansas River is generally acceptable. While there are some known fish kills from low DO pocket bursting during hot summer months, their proximity to gravel bars is unknown. DO is assumed to be a factor inhibiting gravel bar use in the study area.

Reproduction HSI Formula:

$$Paddlefish\ Reproduction\ LRSI = (V1 * V2 * V3 * V4 * V5 * V6)^{\frac{1}{6}}$$

8.2.3.2 *Gravel Bar Modeling*

The 2005 FR/EIS utilized the environmentally conservative assumption to mitigate gravel bars at a 1:1 ratio to result in a no-net-loss of pure gravel bars either be relocating gravel that is dredged to a nearby suitable area or providing new substrate of the appropriate composition to create gravel bar acreage within the project area. Aerial imagery and field surveys conducted during the 2005 EIS development determined the quantities and locations of gravel bars that may be impacted. The model methodology used in the 2005 FR/EIS is in Appendix C-6 of the 2005 EIS – "Aquatic Habitat Evaluation Procedures" and provides a detailed explanation of these efforts.

The Paddlefish Reproductive Habitat HSI was utilized at a requisite for gravel bar modeling efforts as it relies on those metrics tied to gravel bars. Additionally, the paddlefish model is an existing USACE certified model.

Based on the 2005 surveys, there were 165 acres of gravel bars in the system anticipated to be impacted. This modeling effort conservatively assumed that all 165 of those acres would be adversely impacted; however, designs and locations of dredging and structures are still being refined. Final designs and impacts are expected to be less than the 165 acres of gravel bar loss assumed in the modeling efforts.

<u>Existing/Future-Without Project Conditions</u>

Table 16 shows 165 acres of gravel bar habitat that is anticipated to be impacted. Based on the Paddlefish HSI models, the FWOP habitat value was 1.00 as it was assumed that all water regime and quality metrics were optimal as paddlefish naturally occur in this system. However, Variable 3 (V3) which measures availability of gravel bars in the paddlefish model, was used as the primary metric to capture impacts to gravel bars in the MKARNS system. A total of 165 gravel bar AAHUs exist within the action area. Target years (TY) of 0, 1, 2, 5, and 50 were utilized to depict that gravel bar habitat acreage and value is not expected to change over time. TY0 depicts the start of construction while TY50 reflects the 50-year planning horizon of projects.

Table 16. Future-Without Project Conditions

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
Gravel Bar	0	165	1.00	165.00		
	1	165	1.00	165.00	165.00	
	2	165	1.00	165.00	165.00	
	5	165	1.00	165.00	495.00	
	50	165	1.00	165.00	7,425.00	**165**

Future-With Project Conditions

The future-with project conditions assume that, without mitigation, all 165 acres of existing gravel bar habitat within the action area would be removed. Because the HSI value was 1.00, the result would be a loss of all acreage and habitat value, a total of 165 AAHUs (Table 17).

Table 17. Future-With Project Conditions

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
Gravel Bar	0	0	0.00	0.00		
	1	0	0.00	0.00	0.00	
	2	0	0.00	0.00	0.00	
	5	0	0.00	0.00	0.00	
	50	0	0.00	0.00	0.00	**0.00**

Gravel Bar Mitigation

Due to the loss of gravel bar habitat, compensatory mitigation would be required. To determine mitigation requirements, the same modeling process was utilized to calculate necessary acreage that would be required to offset the 165 AAHUs lost. Gravel bar mitigation would involve relocating existing gravel substrate in identified gravel bars to nearby suitable locations or providing new substrate of the appropriate composition to create gravel bar acreage and value in a different, suitable location.

Throughout the MKARNS, a total of 165 acres would need to be restored through the above mitigation efforts to offset the loss of 165 AAHUs throughout the 50-year project life. This was demonstrated in the habitat models through the relocation or creation of gravel bar habitat as described above. Opportunities to accomplish this mitigation are abundant throughout the MKARNS system. Future agency coordination efforts will refine that list to identify the most appropriate sites that avoid and minimize adverse impacts to recreation, navigation, and adjacent non-aquatic lands while maximizing aquatic habitat output. Future coordination efforts will also establish more specific success criteria to ensure the long-term viability of gravel bar mitigation.

The existing habitat type on which the constructed gravel bars would be located is expected to be open water substrates in areas where this habitat type currently does not exist, but conditions are suitable for it. Flow characteristics of the existing gravel bars will be evaluated, and proposed mitigation sites may be associated with new or modified dike fields to ensure the longevity of the gravel bar mitigation. Because of this, the FWOP condition for anticipated mitigation would be open water with an HSI of 0 to reflect that no gravel bars exist in that area (Table 18).

Table 18. Future-Without Project Conditions

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
Open Water	0	165	0.00	0.00		
	1	165	0.00	0.00	0.00	
	2	165	0.00	0.00	0.00	
	5	165	0.00	0.00	0.00	
	50	165	0.00	0.00	0.00	**0.00**

Mitigation of gravel bars is assumed to occur in advance of or simultaneously to the impacts to gravel bars. This approach provides for nearly instant offsets of gravel bar habitat whereas other habitat types, such as those that involve establishing vegetation, take time to grow and mature prior to providing expected habitat outputs. Therefore, it is expected that gravel bar mitigation efforts would be complete at TY0. These assumptions are reflected in the fact that the full 165 HUs needed for mitigation is achieved by TY0 and sustained through TY50 (Table 19).

Table 19. Future-With Project Conditions: Replacing Gravel Bars

Cover Type	Target Year	Acres	HSI	HUs	CHUs	AAHUs
Gravel Bar	0	165	1.00	165.00		
	1	165	1.00	165.00	165.00	
	2	165	1.00	165.00	165.00	
	5	165	1.00	165.00	495.00	
	50	165	1.00	165.00	7,425.00	**165**

For additional details on Habitat Suitability Index Models used, including model assumptions, see chapter 2 of the Mitigation, Monitoring, and Adaptive Management Plan (Appendix E).

Impacts to resources are discussed in more detail in Chapter 10 as well as the SEA.

9. Fish and Wildlife Existing Resources

This chapter provides information on terrestrial and aquatic fish and wildlife resources associated with the MKARNS, including federally listed threatened and endangered species, species proposed for listing, and state-listed species that occur within the project area. Surveys were conducted in the summer of 2004 to gain a better understanding of what variety of fish species occur in the project area. For original

federal listings, refer to Appendix A. For detailed information on the history of data collection for fish and wildlife resources, refer to page 28 of the 2005 CAR (Appendix A).

9.1 Special Status Species

Since 2005, there have been changes to both the federal and state list of species of concern within the action area. Table 20 lists species of concern at the time of this writing in that occur in the MKARNS in Arkansas and Oklahoma.

Table 20. Federal and state listed species of concern in Oklahoma and Arkansas within the action area.
C = Candidate | PT = Proposed Threatened | T = Threatened | E = Endangered | INV = Inventory Element

Scientific Name	Common Name	Federal Status	State Status	State
INVERTEBRATES				
Cicindela hirticollis	Beach-dune tiger beetle	-	INV	AR
Daedalochila peregrina	White liptooth	-	INV	AR
Danaus plexippus	Monarch butterfly	C	-	AR, OK
Ellipsoptera lepida	Little white tiger-beetle	-	INV	AR
Ellipsotera macra	Sandy stream tiger-beetle	-	INV	AR
Lampsilis abrupta	Pink mucket (pearly mussel)	E	-	AR, OK
Lampsilis rafinesqueana	Neosho mucket	E	-	AR, OK
Macrobrachium ohione	Ohio shrimp	-	INV	AR
Nicrophorus americanus	American burying beetle	T	-	OK
Ptilimnium nodosum	Fat pocketbook	E	-	AR, OK
Theliderma cylindrica or *Quadrula cylindrica cylindrica*	Rabbitsfoot	T	-	OK
VERTEBRATES				
Acipenser fulvescens	Lake sturgeon	REVIEW	INV	AR
Alosa alabamae	Alabama shad	REVIEW	INV	AR
Anguilla rostrata	American eel	-	INV	AR
Atractosteus spatula	Alligator gar	-	INV	AR
Calidris canutus rufa	Red knot	T	-	AR, OK
Campephilus principalis	Ivory-billed woodpecker	E	-	AR, OK
Carpiodes velifer	Highfin carpsucker	-	INV	AR
Charadrius melodus	Piping plover	T	-	AR, OK

Scientific Name	Common Name	Federal Status	State Status	State
Corynohinus rafinesquii	Rafinesque's big-eared bat	-	INV	AR
Cycleptus elongatus	Blue sucker	-	INV	AR
Erimyzon sucetta	Lake chubsucker	-	INV	AR
Etheostoma fusiforme	Swamp darter	-	INV	AR
Gallinula galeata	Common gallinule	-	INV	AR
Grus americana	Whooping crane	E	-	AR, OK
Haliaeetus leucocephalus	Bald eagle	-	INV	AR, OK
Hiodon alosoides	Goldeye	-	INV	AR
Hybognathus placitus	Plains minnow	-	INV	AR
Ixobrychus exilis	Least bittern	-	INV	AR
Laterallus jamaicensis spp. jamaicensis	Eastern black rail	T	-	AR, OK
Limnothlypis swainsonii	Swainson's warbler	-	INV	AR
Macrhybopsis hyostoma	Shoal chub	-	INV	AR
Macrochelys temminckii	Alligator snapping turtle	PT	-	OK
Moxostoma pisolabrum	Pealip redhorse	-	INV	AR
Mugil cephalus	Striped mullet	-	INV	AR
Myotis grisescens	Gray bat	E	INV	AR, OK
Myotis lucifugus	Little brown bat	Review	INV	AR
Myotis septentrionalis	Northern long-eared bat	E	INV	AR
Myotis sodalis	Indiana bat	E	-	OK
Notropis girardi	Arkansas River shiner	T	INV	AR, OK
Noturus placidus	Neosho madtom	T	-	OK
Percina nasuta	Longnose darter	Review	INV	AR
Percina phoxocephala	Slenderhead darter	-	INV	AR
Perimyotis subflavus	Tricolored bat	E	-	OK
Phenacobius mirabilis	Suckermouth minnow	-	INV	AR
Picooides borealis	Red-cockaded woodpecker	E	-	AR, OK
Platygobio gracilis	Flathead chub	-	INV	AR

Scientific Name	Common Name	Federal Status	State Status	State
Plecotus townsendii ingens	Ozark big-eared bat	E	-	AR, OK
Polyodon spathula	Paddlefish	-	INV	AR
Porphyrio martinicus	Purple gallinule	-	INV	AR
Regina grahamii	Graham's crayfish snake	-	INV	AR
Regina septemvittata	Queensnake	-	INV	AR
Riparia riparia	Bank swallow	-	INV	AR
Scaphirhynchus albus	Pallid sturgeon	E	INV	AR
Sternula antillarum athalssos	Interior least tern	-	INV	AR
Plants				
Apocynum sibiricum	Clasping dogbane	-	INV	AR
Bergia texana	Texas bergia	-	INV	AR
Croton lindheimerianus var. lindheimerianus	Lindheimer's croton	-	INV	AR
Dalea lanata var. lanata	Woolly prairie-clover	-	INV	AR
Dichanthelium helleri	Rosette grass	-	INV	AR
Euphorbia hexagona	Six-angle spurge	-	INV	AR
Eustoma exaltatum	Catchfly prairie gentian	-	INV	AR
Gaura sinuate	Wavy-leaf gaura	-	INV	AR
Heliotropium convolvulaceum	Phlox heliotrope	-	INV	AR
Lathyrus pusillus	Low vetchling	-	INV	AR
Lindera melissifolia	Pondberry	E	-	AR, OK
Paspalum bifidum	Pitchfork paspalum	-	INV	AR
Physalis cinerascens var. cinerascens	Small-flower ground-cherry	-	INV	AR
Physaria filiformis	Missouri bladderpod	T	-	AR, OK
Ptilimnium nodosum	Harperella	E	-	AR, OK
Schoenoplectus californicus	California bulrush	-	INV	AR
Selaginella arenicola ssp. Riddellii	Riddell's spike-moss	-	INV	AR
Spiranthes odorata	Fragrant ladies'-tresses	-	INV	AR
Streptanthus maculatus ssp.	Arkansas twistflower	-	INV	AR

Scientific Name	Common Name	Federal Status	State Status	State
Obtusifolius				
Valerianella ozarkana	Ozark cornsalad	-	INV	AR
Veratrum virginicum	Bunchflower	-	INV	AR
Vicia ludoviciana	Louisiana vetch	-	INV	AR
Vulpia sciurea	Squirrel-tail six-weeks grass	-	INV	AR
Natural Communities/Habitats				
South-Central Interior Large Floodplain				
West Gulf Coastal Plain Mesic Pine-Hardwood Forest				
West Gulf Coastal Plain Mesic Hardwood Forest				
Mississippi River bottomland Depression				
Mississippi River Riparian Forest				

9.1.1 Endangered Species Act

Section 7(a)(2) of the ESA requires federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any federally listed threatened or endangered species or result in adverse modification or destruction of designated critical habitat. As it was determined that this action "may affect" a federally listed threatened or endangered species or designated critical habitat, a biological assessment was prepared and submitted to the USFWS.

In total, 19 federally listed endangered and threatened species, 2 proposed for listing, and 1 candidate for federal listing occur within the project area. Specific information relative to these species is included in Appendix B.

9.1.2 Migratory Bird Treaty Act

Over 1,000 birds fall under protection of the Migratory Bird Treaty Act, and many occur in Oklahoma and Arkansas. Rare migratory bird species include Bald eagle, prairie falcon, Swainson's hawk, loggerhead shrike, barn owl, and Bell's vireo (Appendix A, Table 14), although there are hundreds of other species that occur along the MKARNS that are protected under the Migratory Bird Treaty Act.

9.1.3 State Species of Concern

Other species that should be considered include state-listed species. Providing protection to these species now may help prevent the need to list them in the future. In addition to the species listed in Tables 14 and 15 of the 2005 CAR (Appendix A), any new species listed in Table 20 of this document will also be considered when accounting for impacts to species.

9.2 Aquatic Resources

Aquatic resources include various aquatic environments including major rivers and their tributaries, lakes, cutoffs, and wetlands, and the resulting habitats that support ecologically diverse flora and fauna. The flood of 2019 and resulting emergency action dewatering, dredging, and open water disposal of the of Webbers Falls and Robert S. Kerr Pools have impacted aquatic habitats and resulted in mussel and fish kills. On a system wide scale, aquatic resources present along the MKARNS may not have significantly changed since the finalization of the 2005 ARNS. However, site-specific studies of proposed work sites and early coordination with the USFWS and states is important to ensure that the resources associated with significant areas such as National Wildlife Refuges or state-managed lands are accurately described and considered within the context of any changes that may have occurred since 2005.

The MKARNS main channel has been degraded by dredging activities associated with establishing and maintaining the navigation channel. Therefore, prime aquatic substrate habitat loss due to maintaining and deepening the channel to 12 feet and adding river training structures would not represent an entirely new disturbance, but rather an exacerbation of the habitat losses and changes associated with the existing activities.

According to the GIS data analyzed, potential impacts to aquatic habitat include a loss of approximately 31 acres of open water, 74 acres of woody wetlands, and 11 acres of emergent herbaceous wetlands as a result of placing dredged material at the identified upland disposal sites (Table 5). These estimates are based on course GIS data, therefore site-specific assessments should take place to identify important habitats, plan for avoidance and minimization, and determine appropriate compensation using the USACE-approved models.

For more information, see page 28 of the 2005 CAR (Appendix A) and section 4.7.2.1 the 2023 SEA (Appendix D).

9.2.1 Fishery Resource

The pre-MKARNS river is reported to have contained fewer and smaller sport fishes, excluding catfish and paddlefish, than currently have been assessed in the river.

After completion of the MKARNS's impoundments, river flows stabilized and formed large pools, which increased surface water, water depth, and backwater acreage. Consequently, the aquatic habitats of the system were altered. These changes increased available habitat for some species while decreasing habitat for others. Habitat declines are potentially responsible for the absence of four species in current collections including the plains minnow, speckled chub, Arkansas River shiner, and suckermouth minnow. Conversely, the abundance of a variety of species including bluegill, crappie, largemouth bass, sauger, and several catfish species have increased in the river since the creation of the MKARNS (Appendix A). Commercial fishing for catfish and buffalo (suckers) has been an important industry along the river since the completion of the MKARNS.

For a list of fish commonly found in the MKARNS, see pages 30-37 of Appendix A or the AR River freshwater mussel survey conducted for the 2005 FR/EIS (Ecological Specialists, 2005).

9.2.2 Gravel Beds

Gravel substrate is an important habitat to aquatic life for spawning, food production, shelter, and hydrologic diversity. The USACE Engineer Research and Development Center (ERDC) found that approximately 165 acres of gravel could potentially be impacted by dredging activities proposed in the 2005 FR/EIS and would require mitigation through relocation or creation of gravel bars. In general. gravel substrate is found throughout the MKARNS except within Pool 1. These gravel beds are included on the maps in Appendix C. Should current dredging needs impact these gravel beds, or other beds identified near dredging locations during updated surveying efforts, they will be relocated, or new beds constructed. Updated gravel surveys will be conducted ahead of any dredging or in-water dredge material placement to ensure accurate accounting of impacts to this habitat type. Monitoring of compensatory gravel bar creation is essential to ensure that these sites are maintained. Gravel bars are dynamic and likely to shift location with large flood events, but implementation of monitoring will ensure that these sites are not immediately covered by sand or silt substrates. Given that creation of new gravel bars as compensation for losses is an unproven concept, monitoring will improve future site selections and improve the success of those efforts. Monitoring plans should be developed in consultation with the USFWS and states.

9.2.3 Mussel Fauna

There is limited information on freshwater mussel species (unionids) composition and distribution for the main stem of the MKARNS. The creation of the MKARNS modified river flow and channel substrate conditions in ways that adversely affected habitat conditions for many mussel species. During a 2004 survey effort, there were no federally listed species found (Ecological Specialists, 2005). Malacologists with the USFWS and AGFC have indicated that the presence of any listed mussel species in the MKARNS is reduced due to altered habitat conditions. However, the USFWS and ODWC documented the presence of listed species in the Verdigris River above the MKARNS, and potentially within portions of the MKARNS. AGFC indicated the presence of significant state listed mussel resources within the Post Canal. For a full list of mussel fauna known to be present in the MKARNS system, see Appendix A.

9.3 Wetlands

The USACE and the EPA jointly define wetlands as those areas that are inundated or saturated by surface or ground water 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. The existing conditions of wetlands scattered along the MKARNS, primarily found in the floodplain of the Arkansas River Valley, have not significantly changed since 2005. Refer to page 43 of the 2005 CAR for more information (Appendix A).

9.4 Terrestrial Resources

Terrestrial resources have not significantly changed since evaluated in the 2005 ARNS FEIS and CAR. Refer to page 44 of the 2005 CAR for more information regarding terrestrial fauna and flora in the project area (Appendix A). See Table 6 for Federal and state-listed species of concern.

10. Impacts to Fish and Wildlife

10.1 No Action Alternative

Isolating this project's effects on future conditions is challenging, as Habitat improvements along the system are likely to continue through other state and federal pathways.

The USACE would continue to maintain commercial navigation on the MKARNS at the current 9-foot navigation depth without the project moving forward. There would be no anticipated changes to current fish and mussel fauna populations or any Federal and State species of concern and the alternative would not require any mitigation.

For more information on anticipated changes in the future without project scenario, see page 65 of the 2005 CAR (Appendix A).

10.2 MKARNS 12-Foot Channel Project Impact Assessment

Under the MKARNS 12-Foot Channel Project, navigation channel depth would be increased to 12 feet throughout the MKARNS, and maintenance of the 12-foot channel would be sustained using existing and new disposal sites. Changes from the 2005 FR/FEIS Alternative E (Navigation Channel Maintenance & Operations Only Flow Management & 12-Foot Depth Navigation Channel Alternative) and the updated MKARNS 12-Foot Channel Project include updated dredging locations and quantities, as well as some confined disposal facility locations.

The following sub-sections are reflected in the Monitoring and Adaptive Management Plan (Appendix E).

10.2.1 Impact Assessment

The impact of a project can be quantified by subtracting the FWP scenarios benefits/impacts from the FWOP benefits/impacts. The difference in AAHUs between the FWOP and the FWP represents the net impact attributable to the project in terms of habitat quantity and quality, where a positive number results in net benefits and a negative result in net loss.

Table 21 summarizes bottomland hardwood forest, shallow/backwater marsh, and gravel bar habitat impacts. These habitats are those anticipated to both be adversely impacted by the channel deepening actions and require compensatory mitigation.

A total of 74.0 acres of bottomland hardwood forest habitat, or 45 AAHUs, are anticipated to be lost from the construction of upland dredge disposal sites and

associated activities. Impacts to shallow backwater habitats are projected to affect 3,780 acres, resulting in a net loss of 1,365 AAHUs from impacts associated with river training structure construction and associated deposition within the dike fields. Up to 165 acres, or 165 AAHUs, of gravel bar habitat are expected to be lost from dredging operations. The results of ecological modeling the project's impacts by habitat type are provided in Table 21. Specific habitat modeling metrics used in the analysis are provided as an Attachment 1 of Appendix E.

Table 21. Net Change in Acres and AAHUs per Habitat Type

Habitat	Existing/FWOP		FWP		Net Change (AAHU)
	Acres	AAHU	Acres	AAHU	
Bottomland Hardwood Forest	74	45	0	0	-45
Marsh	4,974	3,780	1,194	2,416	-1,364
Gravel Bars	165	165	0	0	-165
Total	**5,213**	**3,990**	**1,194**	**2,416**	**-1,574**

10.2.2 Mitigation Summary

Compensatory mitigation is required for unavoidable impacts to the environment that are caused by the recommended plan. To ensure that the mitigation plan would adequately compensate for bottomland hardwood forest, emergent wetland/marsh, and gravel bar losses, the USACE used the HEP methodology to determine the average annual habitat units (AAHU) to quantify adverse impacts and benefits of the project and mitigation efforts (stated in terms of AAHU) to determine the functional value of the project site. Note, while riverine habitat is being impacted via dredging, those impacts are expected to be temporary and only occur while dredging is occurring. No net loss of riverine habitat within the dredging footprint is expected to occur; thus, no compensatory mitigation is required.

Dredging needs continue to be refined, however, several opportunities exist to beneficially use dredged material from the riverbed to build adjacent sandbar islands to benefit migratory birds and would be implemented where feasible.

Implementation of the recommended plan is expected to have unavoidable adverse impacts to bottomland hardwood forest, emergent wetlands/marsh, and gravel bars, as indicated by a net loss in AAHUs in the previous section and in the last column in Table 21. Up to an estimated 126.0 acres of bottomland hardwood forest mitigation would be required to off-set the net loss of 45 AAHUs and up to 2,225 acres of emergent wetland/marsh mitigation would be required to off-set the net loss of 1,365 AAHUs (Table 22). Also shown below, up to 165 acres of gravel bars would need to be in place prior to/during gravel bar impacts to avoid additional gravel bar mitigation. Habitat

metrics used in models are provided as Attachment 1 of the Mitigation, Monitoring, and Adaptive Management Plan (Appendix E).

Table 22. Amount of Mitigation Needed to Off-Set Unavoidable Adverse Impacts

Habitat	Existing/FWOP at Mitigation Sites		FWP- w/ Mitigation		Net Change (AAHU)	Mitigation Need (AAHU)
	Acres	AAHU	Acres	AAHU		
Bottomland Hardwood Forest	135	3	135	48	+45	45
Wetland/Marsh	1,405	2,095	3,629	3,460	+1,365	1,365
Gravel Bars	165	0	165	165	+165	165
Total	**1,705**	**2,098**	**3,921**	**3,673**	**+1,575**	**1,575**

10.2.3 Habitat Mitigation Plan

The primary objective of the habitat mitigation plan is to provide commensurate compensation for the unavoidable impacts to bottomland hardwood, shallow backwater fisheries, and gravel bar habitats from the construction of the MKARNS 12-foot Deepening Project.

10.2.3.1 *Mitigation Measure Identification*

To offset unavoidable impacts to aquatic habitats, numerous methods were considered including mitigation banks and in-lieu fee programs, habitat restoration, and habitat preservation (Table 23). In this table, USACE identified which compensatory measures they deemed feasible and will carry forward as potential options. They largely excluded offsite mitigation as an option for marsh/backwater losses in favor of restoration actions within the MKARNS. While “on site” in-kind mitigation near habitat losses is ideal, the USFWS recommends consideration of compensatory mitigation outside the MKARNS, but within the same river system (including tributaries) as a viable alternative when in-kind mitigation is not possible within the MKARNS. The USFWS also recommends that USACE specify avoidance as a mitigation measure. This is especially important for sensitive areas and/or areas managed as public lands or as mitigation for existing losses associated with the MKARNS. Specifically, there are opportunities to avoid constructing river training structures within the Kerr Pool that would result in losses and unacceptable modifications of lands within the SNWR.

In accordance with Section 2036(c) of WRDA 2007, as amended (33 U.S.C. 2317b), the USACE will consider available and potential in-kind credits from mitigation banks and in-lieu fee programs that have service areas that include the location of project impacts, as potential strategies to address compensatory mitigation for unavoidable ecological impacts. Cursory searches for in-kind credit availability at mitigation banks along the MKARNS in the USACE Regulatory In-Lieu Fee and Bank Information Tracking System (RIBITS) found several banks within the primary and secondary service areas. Few in-

kind credits were available to meet the project needs into the future. Combining credit purchase with some other form of mitigation was considered, however with few credits remaining, purchasing the remaining credits may hinder other smaller projects from utilizing this mitigation strategy in the region. Thus, mitigation bank credit purchase was screened out from further consideration.

Numerous on-site backwater habitat, bottomland hardwood forest, and gravel bar restoration opportunities are present throughout the MKARNS. Additionally, several state and federal managed areas exist along the MKARNS allowing for opportunities to expand contiguous habitats.

Table 23. Measures Considered by the USACE to Mitigate for Habitat Losses

Measure	Description	Carried Forward	Rationale
Mitigation Bank Credits	Purchase in-kind credits for bottomland hardwood, emergent wetland, and gravel bar habitats	No	Few in-kind credits are available throughout several mitigation banks in the vicinity of the MKARNS and would not meet the mitigation needs of the project. Additionally, the mitigation banks would not support natural resources within the MKARNS where the impacts are occurring.
On Site Marsh/ Backwater mitigation	Restoration and enhancement of degraded backwater habitat along the MKARNS. Structural Measures: dike notching, opening of sediment filled channels. Non-Structural Measures: native aquatic plantings; invasive species removal.	Yes	On site shallow backwater habitat mitigation opportunities are present throughout the MKARNS and can be integrated into existing and future dike fields with minimal construction efforts. Several channel mouths can be re-opened to provide restoration to larger backwater and tributary habitats within minimal construction footprints. Substantial cost savings would likely occur by using USACE lands for mitigation.
Off Site Marsh/ Backwater mitigation	Restoration and enhancement of degraded backwater wetlands on rivers, backwaters, and tributaries outside of the MKARNS system. Structural Measures: opening of sediment filled channels and backwater areas, wetland creation and restoration. Non-Structural Measures: native aquatic plantings; invasive species removal.	No	This method would restore habitats where fauna impacted by the MKARNS project may not have access to and leave habitat within the MKARNS in a degraded state. Additionally, cost savings would not be realized by utilizing off site locations. Lastly, off site locations often pose challenges for access during construction, monitoring, and O&M phases, reducing likelihood of success.
On site Bottomland Hardwood Forest mitigation	Restoration and enhancement of bottomland hardwood forest. Structural Measures: grading, where necessary, to support water regime for optimal tree growth. Non-Structural Measures: native tree plantings; invasive species removal (nuisance species removed or controlled)	No	Project sites for dike fields and upland disposal sites would only provide small footprints for forest development. Meaningful bottomland hardwood forest entails contiguous forest acreage to support various fauna that rely on it. Additionally, this effort would require multiple, costly mobilization and monitoring efforts throughout the MKARNS.

Measure	Description	Carried Forward	Rationale
Offsite Bottomland Hardwood Forest mitigation	Restoration and enhancement of bottomland hardwood forest. Structural Measures: grading, where necessary, to support water regime for optimal tree growth. Non-Structural Measures: native tree plantings; invasive species removal (nuisance species removed or controlled)	Yes	The 2005 EIS identified sites near the MKARNS, adjacent to lands owned/managed by state resource agencies, where bottomland hardwood forest mitigation can be implemented to expand contiguous forested habitat.
On site Gravel Bar mitigation	Replace valuable submerged spawning habitat within the MKARNS system. Structural Measures: relocate and/or replace impacted gravel bars as close to the impacted sites as possible.	Yes	The 2005 EIS identified several gravel beds that would potentially be impacted. This effort would relocate or place new gravel beds adjacent to existing sites where future dredging impacts would be avoided and where sedimentation of gravel beds would be at least no different than current site.

For additional details of the Habitat Mitigation Plan, such as site selection, baseline information, and the mitigation work plan, see Section 3 of Appendix E.

10.2.4 Special Status Species

10.2.4.1 *Threatened and Endangered Species*

A full discussion on effects determinations for the federally listed species is available in the 2023 Biological Assessment prepared for the USFWS (Appendix B). A summary of the anticipated effects is in Table 24.

Table 24. Summary of potential impacts and effects determinations for Federally listed species occurring in the proposed action areas. NLAA= not likely to adversely affect.

Common Name	Scientific Name	Federal Status	Range		Effects Determination
			OK	AR	
Alligator snapping turtle	*Macrochelys temminckii*	Proposed Threatened	X	X	May Affect
American burying beetle	*Nicrophorus americanus*	Threatened	X	X	May Affect
Eastern black rail	*Laterallus jamaicensis ssp. jamaicensis*	Threatened		X	No Effect
Fat pocketbook	*Potamilus capax*	Endangered		X	NLAA
Gray bat	*Myotis grisescens*	Endangered	X	X	No Effect

Common Name	Scientific Name	Federal Status	Range		Effects Determination
			OK	AR	
Harperella	*Ptilimnium nodosum*	Endangered		X	No Effect
Indiana bat	*Myotis sodalist*	Endangered	X	X	NLAA
Ivory-billed woodpecker	*Campephilus principalis*	Endangered		X	No Effect
Missouri bladderpod	*Physaria filiformis*	Threatened		X	No Effect
Monarch butterfly	*Danaus plexippus*	Candidate	X	X	NLAA
Neosho mucket	*Lampsilis rafinesqueana*	Endangered	X	X	No Effect
Northern long-eared bat	*Myotis septentrionalis*	Endangered	X	X	NLAA
Ozark big-eared bat	*(=Plecotus) townsendii ingens*	Endangered	X	X	No Effect
Pallid sturgeon	*Scaphirhynchus albus*	Endangered		X	NLAA
Pink mucket (pearly mussel)	*Lampsilis abrupta*	Endangered		X	No Effect
Piping plover	*Charadrius melodus*	Threatened	X		NLAA
Pondberry	*Lindera melissifolia*	Endangered		X	No Effect
Rabbitsfoot	*Quadrula cylindrica cylindrica*	Threatened	X	X	No Effect
Red knot	*Calidris canutus rufa*	Threatened	X	X	NLAA
Red-cockaded woodpecker	*Picoides borealis*	Endangered	X	X	No Effect
Tricolored bat	*Perimyostis subflavus*	Proposed Endangered	X	X	NLAA
Whooping crane	*Grus americana*	Endangered		X	NLAA

To avoid and minimize negatively affecting threatened and endangered species, mitigation measures and best management practices (BMPs) will be used. ESA Section 7 consultation is expected to continue throughout the life of the project because of the prolonged construction timeline and project uncertainties, so these determinations may change as a result.

10.2.4.2 *State Species of Concern*

A full list of state-listed species of concern is available in Table 20. The USACE will continue to work with agencies to avoid and minimize adverse impacts to aquatic species of concern to the greatest extent practicable.

11. Conservation Measures

11.1 Best Management Practices

The work associated with the MKARNS 12-foot Channel Deepening Project will be required to use Best Management Practices (BMPs) to minimize adverse impacts to the environment. The BMPs will be added to the final construction contracts, examples of which are provided below.

- Any development near Waters of the United States (WOTUS) would require a site-specific Spill Prevention Plan during construction, which would include use of BMPs such as proper storage, handling, and emergency preparedness, reducing the risk of contamination.
- Project will utilize the smallest footprint practicable and will be constructed to avoid important resource impacts to the greatest extent practicable. Avoidance areas will be appropriately delineated and flagged to avoid any inadvertent incursions.
- Turbidity minimizing measures for in-water work will be utilized to the greatest extent possible to avoid additional disturbances to resources downstream. These measures will include the use of silt curtains or fences to slow or stop the movement of sediment offsite during in-water work, the construction of disposal sites, and during dewatering of dredged materials.
- The use of existing roadways and existing disturbed sites and disposal sites will be maximized to reduce the disturbance footprint of the project.
- Navigation: No activity may cause more than a minimal adverse effect on navigation
- Aquatic life movements: No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area.
- Spawning areas: Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable.
- Migratory bird breeding areas: Activities in WOTUS that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.
- Shellfish beds: No activity may occur in areas of concentrated shellfish populations.
- Suitable material: No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts.
- Water supply intakes: No activity may occur in the proximity of a public water supply intake.
- Adverse effects from impoundments: If the activity creates an impoundment of

water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

- Soil erosion and sediment controls: Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills must be permanently stabilized at the earliest practicable date.
- Proper maintenance: Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety.

To reduce impacts to state and federally listed species, the USACE proposes the use of conservation measures during the construction process. Conservation measures and BMPs are still being developed under the ESA Section 7 consultation process and additional measures are likely to be added, but as of now the list includes the following:

1. Bat species:
    a. Restrict tree removal to winter months (November 15 thru March 31). If work must commence outside that period, appropriate survey methods will be utilized to identify roosts ahead of construction. Any identified roosts will be protected until vacated or relocated by certified professionals.
    b. No additional, temporary nighttime lighting without limiting the light beam's focus to the work/staging area.
    c. Ensure all operators, employees, and contractors working in areas of known or presumed bat habitat are aware of all environmental commitments, including all applicable BMPs.
    d. Modify all phases/aspects of the project (e.g., temporary work areas, alignments) to the extent practicable to avoid tree removal in excess of what is required to implement the project safely.
    e. Ensure tree removal is limited to that specified in project plans and ensure that contractors understand clearing limits and how they are marked in the field (e.g., install bright colored flagging/fencing prior to any tree clearing to ensure contractors stay within clearing limits).
2. Bird species:
    a. Trained on-site staff will be prepared to issue stop-work orders if protected birds, like those under the Migratory Bird Treaty Act, stopover in construction zones, especially when protected species are utilizing sandbar islands during nesting season.
3. Alligator snapping turtle:
    a. Limit impacts such as dredge material placement or placement of disposal pipes, from suitable habitats.
    b. Limit removal of large woody debris from shoreline that could serve as habitat.
4. Monarch butterfly:
    a. Conduct land clearing efforts outside of migratory and reproductive seasons whenever possible.
    b. Avoid or minimize impacts to identified areas of suitable habitat containing

milkweed host plants.
    c. Replant host plants and flowering plants on disturbed areas following the completion of construction.
5. Fish species:
    a. See above BMPs for reducing turbidity and spills.
6. Mollusks:
    a. Avoid or minimize impacts, including dredging and in-water dredge material placement, to identified areas of suitable habitat.
    b. Silt curtains may be used when operating the dredge to protect mussels from dispersing sediment (May 11, 2005, letter – See Appendix A).
    c. Follow recommendations provided by the USFWS May 11, 2005, letter as feasible for operating near specific mussel beds (Appendix A)
7. Habitat conservation
    a. For details on habitat conservation strategies for priority habitats like gravel bars and backwater fisheries, see the Mitigation, Monitoring, and Adaptative Management Plan (Appendix E).

12. Alternatives

Alternatives for achieving flow management, channel depth and widening, and navigation channel maintenance along the Arkansas River were evaluated in depth on pages 67-72 of the 2005 CAR (Appendix A). The selected alternative was Alternative E from the 2005 ARNS FR/EIS. Alternative E with modified design plans is referred to as the MKARNS 12-Foot Deepening Project throughout the rest of this document. For details on the selection process, see Appendix A.

The only alternatives evaluated are the No Action alternative and 12-Foot Deepening Alternative, which reflects design changes in dredge quantities, upland and in-water dredge locations, and rock volume and location of training structures as described in Chapter 3.

12.1 No Action

The No Action Alternative conditions and repercussions remain the same as outlined in the 2005 CAR. The following statements characterize what would occur for each study feature/component under the No Action Alternative.

- Navigation channel maintenance: Existing dredging and disposal to maintain the 9-foot navigation channel would continue. Dredged material would continue to be disposed of at existing sites until they reached their holding capacity. Only disposal sites approved in the 2018 SWT and SWL DMMPs would be used, and new sites identified in the 2018 DMMPs may need to be constructed and mitigated for.
- Flow management: The current river flow management plan would be used.
- Navigation channel depth: The current 9’ navigation channel would be retained along the entire MKARNS.

In-stream disposal was not approved by the Oklahoma Department of Environmental Quality in Oklahoma when the Operation and Maintenance Program, 1974 EIS was approved. Therefore, future dredge material would have to be deposited in inactive terrestrial sites identified and approved in the 1974 EIS. Many of the terrestrial sites approved in the 1974 EIS have not been utilized since creation of the navigation channel and contain mature vegetation. Utilizing these sites would require significant re-working and additional mitigation for terrestrial impacts.

12.2 12-Foot Deepening with Updated Design

The MKARNS 12-Foot Deepening Project consists of 1) adding new dredged material disposal sites to supplement current disposal site capacity, which will reach capacity at some locations along the MKARNS soon, and 2) increasing the depth of the navigation channel throughout the MKARNS from 9 feet to 12 feet.

The following characterizes what would occur for each feature/component under the MKARNS 12-Foot Deepening alternative:

Navigation channel maintenance: Dredging and disposal to maintain the 12-foot navigation channel would continue, utilizing new and existing upland and in-water disposal sites. Areas with high quality habitat such as bottomland forest or wetlands would be avoided wherever practical.

Navigation channel depth: The current 9-foot navigation channel would be deepened to a 12-foot navigation channel throughout the entire length of the MKARNS, utilizing dredging and rock structures.

13. 2005 CAR Conservation Recommendations

Recommendations from USFWS in 2005 are summarized below, and more details are available on page 116-117 of Appendix A:

- Minimum instream flow releases to maintain water quality standards
- Impacts to floodplain habitat (positive and negative)
- Dredge material contaminant analysis
- Beneficial use of dredge material and disposal sites
- Mitigation plan for unavoidable terrestrial impacts
- Impacts to in-water disposal of dredge material
- Mitigation plan for unavoidable aquatic impacts
- Mitigate impacts to species of concern
- Help prevent further spread of invasive species
- Create sandbar islands
- Seek additional Congressional funding for future monitoring of impacts

14. Summary and Position of the USFWS

While this Supplemental CAR is a USFWS document, initial drafts of the document were prepared by USACE in coordination with the USFWS, AGFC, and ODWC. The USACE provided most of the background information regarding the updated project description, expected resource effects, USACE commitments, and proposed methodologies for calculating compensatory mitigation for unavoidable losses. They drew heavily on the descriptions provided in the 2005 CAR and referenced that document where appropriate. The USFWS provided commentary, in coordination with the states, throughout the drafting process.

Our final recommendations center around the avoidance of resources that the USFWS and states consider significant. These include backwater fisheries spawning/nursery habitats, gravel bars, and forested and emergent wetlands. The USACE has proposed methodologies and USACE-approved models in place to calculate compensatory mitigation for unavoidable losses of these habitats. The USFWS helped develop those methodologies in 2005 and agrees with the updates to be used going forward.

In addition to the resources described above, the USFWS also considers some upland habitats to be significant and worthy of avoidance and, if necessary, compensatory mitigation. The habitats include upland forests, grasslands, and other habitats within areas designated as National Wildlife Refuges or state management areas. Many of these publicly managed lands were originally set aside as mitigation for the original MKARNS project. Some also may support rare and listed species or represent rare habitats. The USFWS recommends that the USACE coordinate with the USFWS and state agency staff early and often prior to the design and construction of specific project features. This will facilitate easier avoidance and minimization of these significant resources. The USFWS also recommends that the USACE recognize the significance of these resources and work with USFWS and state agency staff to design and implement appropriate compensatory mitigation when avoidance is not possible. Early coordination is consistent with the “Agreement Between the US. Fish and Wildlife Service and the U.S. Army Corps of Engineers for Conducting Fish and Wildlife Coordination Act Activities”. This agreement, signed in 2003, was developed to ensure that the USFWS is involved in USACE projects as an active planning team member to find solutions to water resource development problems that avoid, minimize, or mitigate the impacts to fish and wildlife.

15. Literature Cited

Arkansas Geological Commission. 1997. Bulletin 24: Mineral, fossil fuel and water resources of Arkansas.

Ecological Specialists. 2005. McClellan-Kerr Arkansas River Navigation Study: Freshwater Mussel (Unionid) Survey. Prepared for the Tulsa and Little Rock Districts, U.S. Army Corps of Engineers, ESI no. 04-027. 40+pp.

Miser, H. D. 1954. Geological Map of Oklahoma. U.S. Geological Survey. Scale 1: 500,000.

Public Law 108-137 108th Congress Act. 2003. Accessed 10 October 2023. Available at: https://www.congress.gov/108/plaws/publ137/PLAW-108publ137.pdf

Arkansas Game and Fish Commission

July 12, 2024

Colonel Damon Knarr
District Commander
U.S. Army Corps of Engineers, Little Rock District
P.O. Box 867
Little Rock, AR 72203-0867

RE: McClellan-Kerr Arkansas River Navigation System 12-foot Channel Feasibility Study – Arkansas Game and Fish Commission Fish & Wildlife Coordination Act Report letter

Colonel Knarr,

The Arkansas Game and Fish Commission (AGFC) has reviewed the McClellan-Kerr Arkansas River Navigation System (MKARNS) 12-foot Channel Deepening Project Coordination Act Report (CAR). This comment letter has been prepared under the authority of the Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.). FWCA requires that efforts to protect fish and wildlife resources be given equal consideration with other project features. On June 13, 2023 AGFC signed on to this project as a cooperating agency and regularly attends coordination meetings and is assisting in efforts to formulate and evaluate alternatives.

The language of the FWCA (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) states, "... whenever the waters of any stream or other body of water are proposed or authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatever, including navigation and drainage, by any department or agency of the United States, or by any public or private agency under Federal permit or license, such department or agency first shall consult with the United States Fish and Wildlife Service, Department of the Interior, **and with the head of the agency exercising administration over the wildlife resources of the particular State** wherein the impoundment, diversion, or other control facility is to be constructed, with a view to the conservation of wildlife resources by preventing loss of and damage to such resources as well as providing for the development and improvement thereof in connection with such water-resource development." This section of the FWCA puts the state wildlife agency on equal footing with the United States Fish and Wildlife Service for the review of federal water development projects. Any coordination that has occurred between the U.S. Army Corps of Engineers (USACE) and the U.S. Fish & Wildlife Service (USFWS) for the MKARNS 12-foot Channel Deepening Project should be extended to the Arkansas Game and Fish Commission and the Oklahoma Department of Wildlife Conservation (ODWC). Comments and recommendations from AGFC and OCWC, under the FWCA, should be considered and weighted equally with those of the USFWS.

For the MKARNS 12-foot Channel Deepening Project Draft Supplemental Environmental Assessment (SEA), AGFC reviewed and submitted comments on March 10, 2024. That comment letter is included as an attachment to this letter to insure the continued consideration of our comments and recommendations with one correction regarding the second full paragraph on the seventh page that reads:

> The Little Rock District staff has indicated that dredging in the Post Canal possibly less than indicated in the SEA. However, the mussel survey for the post canal is 25 years old, and Fat Pocketbook have been collected nearby at mile 11-12.4 in the White River (BA; page 26). It seems prudent that mussel surveys be performed before any dredging in the lower White River and the post canal to ensure endangered mussels are not impacted. It is illegal to purposely kill mussels (AGFC Code 31), and all appropriate precautions should be made to avoid killing mussels. Just as it is illegal to kill hundreds of deer, it is illegal to purposefully kill hundreds of mussels. Mussels

should be translocated to prevent killing them, and any accidental killing of mussels should be mitigated for at American Fisheries Society (AFS) fish kill monetary values per individual killed.

AGFC recognizes that federal navigational servitude may exempt USCAE activities, conducted for the purpose of navigation, from complying with AGFC Code 31.

AGFC would like to have a better understanding of the monitoring commitments by USACE for sandbar islands as stated in Section 4.5. Failure of sandbar islands pose serious sedimentation risks and water quality issues for downstream areas.

AGFC would like to have more specificity as to how USACE will provide protections to state-listed species as stated in Section 9.1.3.

For any activities planned for National Wildlife Refuges, USACE should comply with the National Wildlife Refuge System Administration Act of 1966 for compatibility determinations.

AGFC requests that early and frequent coordination occur between USACE, the USFWS, AGFC, and ODWC as the MKARNS 12-foot Channel Deepening Project continues throughout the planned phased approach for construction. As highlighted by the USFWS in their comments dated July 12, 2024, "The uncertainty regarding the specificity and timing of project features identified within the SEA increases this need. This coordination clarifies avoidance and minimization measures and may reduce the need for compensatory mitigation." Included in this letter as an attachment is the 2003 *Agreement Between the US. Fish and Wildlife Service and the U.S. Army Corps of Engineers for Conducting Fish and Wildlife Coordination Act Activities* (Agreement). The Agreement details how FWCA activities should occur between the USFWS and the USACE. While the Agreement does not include the state wildlife agencies, as explained above, FWCA (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) mentions the USFWS and the state wildlife agencies as equals for the review of federal water development projects. AGFC would appreciate USACE following the directions for FWCA activities as outlined in the Agreement and to include AGFC and ODWC along with the USFWS.

The CAR states throughout that the USACE will work with resource agencies, "… to the maximum/greatest extent practical." AGFC requests documentation from USACE as to what that coordination and planning will be moving forward with pre-construction, construction, and mitigation planning. Short timeframes and milestones should not be used as justification for a lack of coordination and input from state and federal resources agencies.

AGFC supports the comments of the USFWS, Arkansas Ecological Services Office, dated July 12, 2024.

Please direct any questions regarding this AGFC CAR letter to Jennifer Elise Sheehan at 501-680-0319 or Jennifer.sheehan@agfc.ar.gov.

The opportunity to comment is appreciated,

Jennifer Elise Sheehan,
Arkansas Game and Fish Commission
Chief, Environmental Coordination Division

Attachments

- AGFC comment letter dated March 10, 2024 on the MKARNS 12-foot Channel Deepening Project Draft Supplemental Environmental Assessment

- *Agreement Between the US. Fish and Wildlife Service and the U.S. Army Corps of Engineers for Conducting Fish and Wildlife Coordination Act Activities*, Dated January 22, 2003

Cc:

- Jason Hight, Field Supervisor, USFWS, Arkansas Ecological Services Office
- Patrick Fitzmorris, Project Leader, USFWS, Dale Bumpers White River National Wildlife Refuge
- Kevin Stubbs, Biologist, USFWS Oklahoma Field Office
- Damon Taylor, Refuge Manager, Sequoyah National Wildlife Refuge
- Brett Thompson, Wildlife Biologist, Oklahoma Department of Wildlife Conservation
- Chris Whisenhunt, Senior Biologist, Oklahoma Department of Wildlife Conservation
- Paxton Smith, Wildlife Biologist, Oklahoma Department of Wildlife Conservation

AGREEMENT BETWEEN THE U.S. FISH AND WILDLIFE SERVICE AND THE U.S. ARMY CORPS OF ENGINEERS FOR CONDUCTING FISH AND WILDLIFE COORDINATION ACT ACTIVITIES

ARTICLE I - INTRODUCTION

a. Section 1 of the Fish and Wildlife Coordination Act, as amended, (FWCA), (16 U.S.C. §§ 661 et seq.), states the general policy that fish and wildlife conservation shall receive equal consideration with other project purposes and will be coordinated with other features of water resources development projects. To accomplish this, section 2(a) of the FWCA establishes that preconstruction planning on project development shall be coordinated with the U.S. Fish and Wildlife Service (FWS). Section 2(b) of the FWCA authorizes the FWS to conduct surveys and investigations to determine the possible damage of proposed developments on wildlife resources; to make recommendations for preventing their loss or damage; and to offer measures for developing and improving them. Section 2(e) of the FWCA authorizes construction agencies to transfer funds to the FWS to conduct investigations and prepare the reports necessary to carry out the purposes of the Act.

b. The provisions of this Agreement have been developed to ensure the FWS is involved in U.S. Army Corps of Engineers (Corps) projects as an active planning team member to help find solutions to water resources development problems that avoid, minimize, or mitigate impacts to fish and wildlife. A major goal of this Agreement is to ensure the FWS is invited and funded, when applicable, to participate early in and throughout the planning process to facilitate the FWCA's equal consideration provision.

c. In compliance with section 2(a), (b) and (e) of the FWCA, the Corps and the FWS have established coordination procedures and policy for obtaining FWS input concerning the fish and wildlife resources associated with water and related land resources development activities. Accordingly, this Agreement provides guidance and establishes uniform procedures for all Corps and FWS offices to follow in implementing field-level negotiations for funding FWS efforts on Corps water resources study and development programs. Specifically:

(1) This Agreement contains provisions for the transfer of funds from the Corps to the FWS for activities pursuant to the FWCA.

(2) This Agreement applies to General Investigations, Special Studies, Continuing Authorities, Preconstruction Engineering and Design studies, Construction projects involving fish and wildlife habitat, coordination on new dredged material placement sites, and Post Authorization Modifications requiring FWCA involvement. This Agreement applies to Corps planning, engineering, design, and construction activities, including post-construction monitoring.

(3) This Agreement does not apply to the transfer of funds for FWS review of National Environmental Policy Act (NEPA) documents, Section 7 consultations under the Endangered Species Act (ESA), Operations and Maintenance, or general interagency coordination on matters unrelated to FWCA activities. Funds will not be transferred under this Agreement for fish and wildlife investigations associated with emergency actions, Corps regulatory responsibilities, or operating Corps projects. Funding for these activities may be available using existing or new cooperative agreements and other funding mechanisms, where appropriate. Further, funds will not be transferred under this Agreement for FWS activities associated with annual program coordination for FWCA activities. Funds cannot be transferred to State resource agencies for participation in FWCA activities. Generally, reconnaissance phase studies leading to a 905(b) report have limited funds and, as a result, funds will not be provided to the FWS to support its participation. However, funds for FWS involvement on large projects may be provided for participation during the reconnaissance phase.

d. This Agreement supersedes the May 1980 Agreement (amended in September 1982) between the Corps and FWS. Commitments made in compliance with the previous Agreement will be honored.

e. Procedures and obligations stated in this Agreement shall apply to all Corps districts and FWS offices and will be amended only following review and mutual agreement at the Washington level. Either agency may request review of this Agreement. Corps districts and FWS field offices may mutually agree to develop local operating procedures to facilitate effective implementation of their agreements, provided those procedures are fully consistent with this Agreement.

ARTICLE II - GENERAL

a. For purposes of this Agreement, the term "FWCA activities" means FWS involvement early and throughout the Corps process of project development and implementation, including the reconnaissance phase. The FWS participates as an active planning team member to conduct studies and investigations on fish and wildlife aspects of Corps water resources projects, as FWS staffing and workload constraints allow. In carrying out the purposes of the FWCA, FWS personnel shall attend scoping meetings and review project documents. In addition, FWS personnel may visit sites; survey, investigate, map, and evaluate wildlife resources; and determine the relative quality and quantity of terrestrial habitat and aquatic resources potentially impacted by project construction and operation. FWS personnel shall assist in Corps development of project alternatives and projections of future conditions both with and without the project. The FWS may also help the Corps develop incremental analyses of features designed to mitigate or restore wildlife resources, and monitor post project conditions to determine the effectiveness of mitigation and restoration features. This will help to assess the need for project changes and adaptive management. As appropriate, the FWS will provide information to the Corps through FWCA reports, planning aid letters, studies, and other documents, as well as through participation in workshops, meetings, and public hearings.

b. The Corps will invite FWS involvement as an active planning team member throughout the planning, construction, monitoring, and adaptive management of water resources development projects. Each Corps district and FWS field office will designate a primary point of contact by title (and an alternate) to serve as the lead person to manage all activities required under this Agreement. The point of contact for each agency will: be a senior manager or senior staff; coordinate (act as liaisons) with their counterpart and others involved; remain up-to-date on the general status of each study/project; and serve as a trouble shooter working in partnership to resolve problems that may arise.

c. The FWS will be the Federal agency through which the Corps district will first negotiate for fish and wildlife investigations in compliance with FWCA requirements. This negotiation, which includes a discussion of the feasibility study plan, schedule, and budget, will take place during development of the project management plan (PMP). The PMP will describe the data the Corps will give the FWS; when it will be delivered; the level of analyses needed for all FWCA activities; and time schedules for the completion of both agencies' actions. A Statement of Work (SOW) will be developed using the PMP or as soon as sufficient information is available. The Corps and FWS will agree on the appropriate level of cost breakdown for each SOW. Additionally, the FWCA requires the Corps to coordinate with the appropriate State fish and wildlife agencies. Corps policy, based on Government Reorganization Plan No. 4, dated August 4, 1970, also requires Corps offices to coordinate with the National Marine Fisheries Service (NMFS) in connection with activities that involve resources for which NMFS has statutory responsibility. This Agreement does not remove or alter these responsibilities.

d. The FWS has 30 calendar days from the notification date (notification could be by e-mail or telephone) of the signing of the Feasibility Cost Sharing Agreement (FCSA) to notify the Corps (which also could be by e-mail or telephone) that it will conduct the fish and/or wildlife investigations on a particular study. If the FWS determines it cannot perform all or a portion of the work itself, and so notifies the Corps within 30 days, the Corps may then use an alternate contracting source following consultation between the two agencies. Alternate contracting sources may be obtained through the Corps or FWS. All documents prepared by the alternate source contractor will be forwarded to both parties for use in preparation of their respective reports. Alternative source contractor selection shall not occur prior to coordination between both agencies, as outlined in Article VI. If the FWS contracts for the fish and wildlife investigations, the district will assist in the preparation of the contractor's SOW. If the district contracts elsewhere, as a result of notification from the FWS within the 30-day time period that it cannot perform the work, the FWS may assist in developing the contractor's SOW and review the data and analyses to ensure their adequacy. If the district contracts elsewhere, due to a lack of response from FWS regarding their ability to conduct the work within the 30-day time period, the FWS may help develop the contractor's SOW and review the data and analyses to ensure their adequacy. The FWS will be given the opportunity to help develop the contractor's SOW.

e. Non-Federal sponsors may, with FWS and Corps concurrence, be able to perform some of the tasks pertaining to fish and wildlife evaluations for projects outlined in Article I(c)(2) as part of their cost-sharing responsibilities. Corps district offices and points of contact will ensure the non-Federal sponsors understand the section 2(b) requirements for the Corps to coordinate with the responsible FWS office to prepare FWCA reports and studies.

ARTICLE III - SCOPE OF WORK FOR FWCA COORDINATION ACTIVITIES

a. Each fiscal year, the Corps district and the FWS field office(s) will jointly prepare a SOW with a schedule and estimate of funds needed to fulfill FWCA requirements for each project or study, or group of projects and/or studies. Both agencies recognize the SOW for a large project or study is much different than for a small one with very limited funds and expedited schedules. For this reason, a letter that includes FWS comments and recommendations may be acceptable in fulfilling FWCA requirements for small projects, especially for those in the Continuing Authority Program. The need for such planning aid reports is a matter of mutual agreement between the Corps and FWS and is determined on a project-by-project basis.

b. The FWS activities to be covered by transfer funding should be clearly indicated in the detailed SOW. This SOW will describe the data and information needed; specific work to be accomplished, including the FWS document required and dates for completion; detail and effort required; conditions of contracts and subcontract(s) (if appropriate); estimated cost for investigations; specific, periodic FWS and Corps progress reviews needed for billing; schedule and milestones of study activities; and time tables for information sharing between the Corps and the FWS. This includes a schedule for collecting and exchanging data and the dates of coordination meetings, public hearings, and workshops. The Corps and FWS will agree on the appropriate level of cost breakdown for each SOW.

c. Each SOW will include activities that are agreed upon by the Corps and FWS to be necessary to satisfy the study and reporting provisions of section 2(b), and that provide the Corps with fish and wildlife resources data, information, and recommendations. The amount, quality, and scale of data, as well as the data analysis included in the SOW must be consistent with the complexity of decisions for which the data will be used, limitations in funding and time, and the significance of the fish and wildlife resources involved. The data and analyses from these activities will be used by the Corps to consider fish and wildlife resources at each stage of water resources development projects requiring FWCA involvement; serve as a basis for FWS assessment and evaluation of proposed alternative measures and plans for fish and wildlife resources; and provide a substantive basis for the recommendations the FWS and Corps may deem appropriate to preserve, mitigate, or restore these resources. The SOW will include provisions, as needed, for the FWS to attend public hearings, meetings, and workshops scheduled in conjunction with the Corps planning process.

d. The SOW for each project or study negotiated by the Corps district and the FWS field office will be forwarded by the District Engineer to the Regional Director of the FWS or their designees for approval. A copy of the SOW will be sent concurrently to the appropriate Corps district and FWS field offices. Approval of the SOW may either be prior to, or concurrent with transmittal of the funding document for the study. Agreed upon revisions will be displayed as supplements to the SOW.

e. Environmental resources data and information may be available for the study area. Every effort will be made to use relevant existing information from all available sources and to reach a consensus on the appropriateness of their use.

f. The methods of analyses, techniques, and required specialized expertise for fish and wildlife studies conducted by the FWS will be set forth in the SOW. Accordingly, reports submitted to the Corps will include data collected and analytical procedures used, meeting time constraints outlined in the SOW. Districts will provide the FWS with copies of all appropriate reports and appendices, including reports recommending no Federal action or the termination of a study, as set forth in the SOW.

g. The district and field office will coordinate throughout the year, and information on each study or project will be exchanged in a timely manner. Formal study or project-specific coordination meetings will be scheduled in the SOW at least twice a year, and more frequently if mutually agreeable to both agencies. These meetings can be in the form of project-specific technical committee meetings, where all interested and involved agencies and parties are in attendance. Meetings may also be in the form of conference calls or video teleconferences, as appropriate. The Corps will provide the FWS with copies of transcripts recorded (if any) at project/study-related meetings.

ARTICLE IV - PROCEDURES

a. In budget submittals and requests, each District Engineer will include funds to support FWCA study and reporting requirements, as set forth in SOWs.

b. Corps budgetary guidance is provided around March of each year (about 18 months before the start of the fiscal year) through program development guidance. Corps and FWS coordination must be early enough to provide meaningful input into the budget process.

c. Formal programmatic meetings will be held between the two agencies at least annually to review all upcoming and ongoing Corps activities requiring FWS coordination, and to identify needed fish and wildlife information and studies. Other formal or informal programmatic meetings will be held as required. The Corps and the FWS points of contact will jointly lead these programmatic meetings.

d. Early in the fiscal year, the District Engineer or their designee will, in coordination with the Regional Director or their designee, review the status of each study

or project requiring FWS input for the current fiscal year. Adjustments to previously negotiated work may be required due to changes in the study or project, including schedules and funding levels. In addition, the agencies will review the portion of the district's anticipated Civil Works program for each of the next two fiscal years that is covered by the FWCA. These items will be discussed at the formal programmatic meetings held between the two agencies. As appropriate, scoping and funding negotiations for future work may be included in this programmatic meeting. These negotiations are beneficial to both offices and should take place as early as practicable. The FWS current fiscal year program may also be reviewed at this programmatic meeting, which should be held after the Corps submits its budget request to the Office of Management and Budget (OMB), typically in September. All parties will treat budgetary data as privileged information. No office shall reveal any budgetary data prior to release of the President's budget.

e. After the Corps submits its budget request to the OMB, districts will give FWS field offices a list of studies and projects along with the proposed amount for the FWS for each. The list of studies and proposed amounts of funding should be considered only a very rough approximation, since they are subject to change as they go through the funding process.

f. After transmittal of the President's budget to Congress and official release to the public (typically February), the district will give FWS Regional and field offices an updated list of all projects or studies included in the President's budget and the tentative amounts proposed for FWS FWCA activities. Upon budget enactment, the district will give the FWS Regional and field offices an updated list of all the projects included in the enacted budget and the amount proposed for FWS FWCA.

ARTICLE V - AGENCY RESPONSIBILITIES

a. Corps Responsibility. The following are the responsibilities of Corps District Engineers, their designees, and points of contact for the administration of this Agreement. District Engineers or their designees will:

(1) Ensure that controls are in place for proper administration of the Agreement. The district will ensure the FWS is provided the opportunity to participate in determining FWS FWCA activities and is funded to support active planning team membership in studies/projects, including early involvement in reconnaissance phase, other early planning efforts, and throughout the study/project planning process.

(2) Ensure that, at a minimum, annual meetings and other meetings, both formal and informal, on the administration of this Agreement take place.

(3) Ensure that budget requests include the amounts needed for the FWS to conduct fish and wildlife resources studies and analyses, prepare reports, and complete other related FWCA activities for each study or project requiring FWCA involvement.

(4) Ensure the Corps' fiscal year budget information that is given to OMB on studies or projects requiring FWCA coordination, and the proposed amount for transfer to the FWS for each, is sent to the FWS field office point of contact promptly.

(5) Ensure that FWS field offices are given a list of studies and projects requiring FWCA coordination and the amount proposed for the FWS after the President's budget is released, and after the budget is enacted. The Corps will also provide copies of completed Feasibility Cost Sharing Agreements, if requested. After funds are appropriated and have been allocated to the Corps districts, they will make every effort to transmit funds (using ENG FORM 4914-R, Sep 97) for all projects as soon as possible.

(6) Ensure SOWs are prepared in adequate detail for each study/project and are approved for all studies or projects that require coordination under the FWCA pursuant to this Agreement.

(7) Ensure that Corps districts transfer information needed by the FWS for FWCA activities as jointly agreed to in the study schedule and SOW. This includes information that has been jointly determined to be necessary to conduct studies and analyses, including available fish and wildlife information and maps of the study area; engineering, hydrologic, survey, and alternative futures data; and real estate and land-use information.

(8) Keep the FWS field office(s) informed of any changes during the budgetary process, deviations from milestone schedules, and modifications in project details (e.g., alternative changes or modifications) and other factors that may affect FWS FWCA activities and responsibilities. The schedule in the SOW should be adjusted accordingly.

(9) Establish a system with the FWS point of contact so that problems in the timely submission of studies and reports can be resolved quickly and amicably, or elevated to higher authority if necessary.

(10) Provide a written response to the comments and recommendations contained in the draft FWCA report. Ensure FWCA documents are included in or attached to all studies or reports prepared by the district, which will help determine requests for authorization and funding. Provide FWS with copies of all study reports and appendices.

(11) Facilitate a better understanding of the missions and responsibilities of the Corps through regular exchanges of information and inclusion of the FWS in all appropriate projects and project delivery team meetings. The Corps should facilitate opportunities for the FWS to participate in Civil Works water resources development-related training, such as planning, environmental restoration, and FWCA. FWS participation in Civil Works water resources development-related training will not be funded by the Corps under this Agreement.

b. FWS Responsibility. The following are the responsibilities of the FWS Regional Directors, their designees, and field office points of contact for the administration of this Agreement. Regional Directors or their designees will:

(1) Ensure that controls are in place for proper administration of the Agreement.

(2) Ensure FWS field offices conduct fish and wildlife investigations and provide fish and wildlife analyses, planning aid letters, and draft and final FWCA reports in accordance with the established schedules and level of analyses discussed in the SOW.

(3) Provide reports whose length is commensurate with the complexity of the project.

(4) Ensure FWS field offices transmit bills to the Corps Finance Center in Millington, Tennessee, and the Corps district point of contact in a timely manner (but no less than monthly) consistent with the agreements in the funding documents (ENG FORM 4914-R, Sep 97).

(5) Ensure that FWS field offices, within 30 days of FCSA execution, notify the district point of contact of any lack of capability to complete requested work within the milestone schedules established in the SOW or of any need to reschedule deadlines.

(6) Ensure that FWS field offices, within 30 days of FCSA execution, negotiate, select, and identify any portions of work that need to be contracted; help develop SOWs (e.g., tasks, products, time schedules, and estimated costs); and provide input on contractor selection.

(7) Ensure that FWS field offices provide the necessary consultation and conduct the necessary review whenever a fish and wildlife study or portion thereof is contracted by the district or the FWS, or is accomplished by the non-Federal sponsor.

(8) Ensure that FWS field offices establish a system with the district point of contact so problems in the management, timing, analysis, and preparation of studies and reports can be resolved quickly and amicably or elevated to a higher authority.

(9) Facilitate a better understanding of the missions and responsibilities of the FWS through regular exchanges of information and inclusion of the Corps in appropriate FWS projects. The FWS will facilitate opportunities for the Corps to participate in training on the FWCA. Corps participation in FWS-related training will not be funded by the FWS under this Agreement.

(10) Ensure that, at a minimum, the FWS field offices and Corps districts convene annual meetings and other meetings, both formal and informal, on the administration of this Agreement.

(11) Provide a response to Corps comments on the draft FWCA report, which delineates how and where the comments were addressed in the revised or final FWCA report, to complete the administrative record.

ARTICLE VI - PERFORMANCE

Both the Corps and FWS should strive to honor the commitments made by both parties in each SOW. In the event that either party cannot meet a commitment, the Corps and FWS will proactively work together to make any adjustments, including the use of an alternative source to complete the work, if necessary. Alternate contracting sources may be obtained through the Corps or FWS. All documents prepared by that source will be forwarded to both parties for use in preparation of their respective reports. Alternate source contractor selection shall not occur prior to coordination between both agencies. The use of an alternative contracting source should be the exception rather than the rule. Lack of planning is not a suitable reason for using a contractor.

ARTICLE VII - COST ESTIMATES AND INDIRECT COSTS FOR FWCA ACTIVITIES

a. The cost estimate for FWCA study activities will include 38 percent of field expenditures for indirect costs for each fish and wildlife study and/or report, and will reflect the costs in the Regional and central offices of the FWS for their activities. However, when a fish and wildlife study, or a portion thereof, is subcontracted by the FWS, the agency will receive 15 percent (not 38 percent) indirect costs for the subcontracted portion of the fish and wildlife investigations.

b. FWCA cost estimates for each project and/or subcontract will consist of labor costs by category, material, equipment, and other costs for the FWS field office or subcontractor involved.

c. Cost estimates for FWCA activities will include a lump sum person-day cost (8 hour day) per task, and the cost of any special material or equipment required for a particular project on a field office basis. Field office person-day costs will include support services such as material and supplies, leave, office equipment, telephone, travel, and training. The percent of support services charged to transfer funds will be on a prorated basis.

d. Cost estimates for FWCA activities in conjunction with the study will include provisions required for FWS attendance at planning study team meetings, public hearings, and other meetings and workshops, as appropriate.

ARTICLE VIII - METHOD OF PAYMENT AND BILLING PROCEDURES

a. Funding of FWS activities under this Agreement will be performed using an ENG FORM 4914-R, Sep 97. Funding will be provided for each individual study or project using this form. The ENG FORM 4914-R, Sep 97 will include the negotiated amount of funds required to complete each FWCA activity and the SOW (or a copy of the previously executed SOW if it has already been approved) for each study or project. When appropriate, individual SOWs can include the FWCA activities that are expected over a number of years. The signed ENG FORM 4914-R, Sep 97 obligates Corps funds and provides FWS authority to obligate funds and bill the Corps for work accomplished. The ENG FORM 4914-R, Sep 97 will show the Corps district as the ordering office and the appropriate FWS field office as the performing office.

b. At the beginning of each fiscal year, or at other times as appropriate during the fiscal year, the Corps will transmit a signed ENG FORM 4914-R, Sep 97 with a SOW for each study or project to the Regional Director for signature. Once signed, the Regional Budget and Finance Officer will give the FWS Denver Finance Center copies of each signed ENG FORM 4914-R, Sep 97 containing billing instructions.

c. Billing will be conducted under the Intra-governmental Payments and Collection System (IPAC), and will show the district as the debtor (office billed), and the applicable FWS office as the creditor (billing office). The Corps will be billed by the FWS Finance Center on at least a monthly basis. The Corps must receive the bills no later than 21 calendar days after the last day of the month. The bills will reflect direct costs incurred plus 38 percent for indirect costs (or 15 percent for indirect costs on subcontract work) and will be itemized consistent with the negotiated cost estimate for each study.

ARTICLE IX - OBLIGATION AUTHORITY

If there is not a new Appropriations Act signed by the President prior to the start of the fiscal year, and carry-over funds are not available, spending authority for ongoing studies will be given to the FWS based on the previously developed SOW if that authority is received by the Corps. In the event the Corps does not receive the authority, the Corps will notify the FWS promptly.

ARTICLE X - SUSPENSION OR TERMINATION OF STUDIES

a. Delays in project starts at the beginning of the fiscal year, other starts and stops of projects, and delays in funding make it difficult for the FWS to plan its workload and staffing needs. Therefore, every effort will be made to avoid interrupting the funding that has been negotiated. When such interruptions become necessary, the FWS will be

contacted immediately and efforts will be made to minimize the impact on FWS staff and their ability to provide needed services to the Corps.

b. In the event of rescission, revocation, lack of sufficient appropriations, or a determination that the water resources study will have unfavorable findings, and with concurrence of higher authority, the Corps district may suspend or terminate work on any fish and wildlife study, including subcontracts, and may withdraw the remaining funds. In this event, the Corps shall immediately notify the FWS field office in writing via SF30 with a copy given to the Regional Director.

c. Upon receipt of written suspension or termination of a study by the district where an ENG FORM 4914-R, Sep 97 has been signed, and where work by the FWS has been initiated but not completed, the FWS will bill the Corps, including the 38 percent for indirect costs (or 15 percent for indirect costs on subcontract work) for work accomplished as of that date. If the suspended or terminated study or project is reactivated and rescheduled, a new SOW, cost estimate, and schedule for FWS studies will be negotiated. The Corps will forward the new ENG FORM 4914-R, Sep 97 and SOW to the Regional Director for signature.

ARTICLE XI - DISPUTE RESOLUTION

In carrying out the above Agreement, every effort will be made to resolve all problems at the Corps district and FWS field office level. The FWS and the Corps points of contact have the lead on problem resolution. If this cannot be achieved, points of contact should refer the problem to the appropriate Corps Division and FWS Regional Office. Unresolved problems that impair either agency's abilities to carry out its mandated responsibilities should be referred to the Director of Civil Works, U.S. Army Corps of Engineers, and Director, U.S. Fish and Wildlife Service for resolution. Any referrals to the Washington level shall document the specific nature of the problems and efforts taken at the field level to resolve the disagreement.

ARTICLE XII - EFFECTIVE DATE

This Agreement revision shall become effective when signed by both the Service and the Corps.

Steve Williams
Director
U.S. Fish and Wildlife Service

1/22/03
Date

Robert B. Flowers
Commander
U.S. Army Corps of Engineers

22 JAN 2003
Date

MKARNS 12-Foot Channel Supplemental Environmental Assessment

Responses to the USFWS Fish and Wildlife Coordination Act Report dated July 12, 2024

Recommendations

#1: Our final recommendations center around the avoidance of resources that the USFWS and States consider significant. These include backwater fisheries, spawning/nursery habitats, gravel bars, and forested and emergent wetlands. The USACE has proposed methodologies and USACE-approved models in place to calculate compensatory mitigation for unavoidable losses of these habitats. The USFWS helped develop those methodologies in 2005 and agrees with the updates to be used going forward.

USACE Response: **Adopt.** USACE is committed to implementing avoidance measures and Best Management Practices (BMPs) to the greatest extent practicable when designing and constructing project features. A robust compensatory mitigation plan has been developed to account for unavoidable impacts to significant habitats, including backwater, gravel bar, and forested and emergent wetland habitats. USACE is committed to working closely with both the Service and States as the project moves forward to ensure appropriate avoidance and mitigation measures are implemented during the Pre-Construction Engineering and Design (PED) and Construction phases of the project.

#2: In addition to the resources described above, the USFWS also considers some upland habitats to be significant and worthy of avoidance and, if necessary, compensatory mitigation. The habitats include upland forests, grasslands, and other habitats within areas designated as National Wildlife Refuges or State management areas. Many of these publicly managed lands were originally set aside as mitigation for the original MKARNS project. Some also may support rare and listed species or represent rare habitats. The USFWS recommends that the USACE coordinate with the USFWS and State agency staff early and often prior to the design and construction of specific project features. This will facilitate easier avoidance and minimization of these significant resources. The USFWS also recommends that the USACE recognize the significance of these resources and work with USFWS and state agency staff to design and implement appropriate compensatory mitigation when avoidance is not possible. Early coordination is consistent with the "Agreement Between the US. Fish and Wildlife Service and the U.S. Army Corps of Engineers for Conducting Fish and Wildlife Coordination Act Activities". This agreement, signed in 2003, was developed to ensure that the USFWS is involved in USACE projects as an active planning team member to find solutions to water resource development problems that avoid, minimize, or mitigate the impacts to fish and wildlife.

USACE Response: **Partially Adopt.** USACE Engineer Regulation 1105-2-100, Appendix C on Environmental Considerations describes mitigation planning and recommendations. The ER discusses mitigation for "significant ecological resource losses." Policy dictates that in order to qualify for compensatory mitigation, habitat lost must be recognized as significant across institutional, public, and technical perspectives. While USACE recognizes the value that upland forest and grassland habitats provide to wildlife, it is not considered a significant ecological resource by policy and precedent. As such, USACE does not have a funding mechanism through which to pursue compensatory mitigation for these habitats. The same is true for habitats existing on National Wildlife Refuges (NWRs) and Wildlife Management Areas (WMAs). However, USACE is committed to early and often coordination in line with the "Agreement Between the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers for

Conducting Fish and Wildlife Coordination Act Activities" not only with the Service but also the States to avoid adverse impacts to all habitats, including uplands, grasslands, NWRs, and WMAs, to the greatest extent practicable. As we move forward with the design of specific project features, USACE anticipates close collaboration with agencies to identify important habitats and modify feature locations and design as practicable to avoid and minimize impacts to fish and wildlife. This includes project features proposed at Sequoyah National Wildlife Refuge and on ODWC operated WMAs.

Responses to the AGFC Fish and Wildlife Coordination Act Report Letter dated July 12, 2024

AGFC reviewed and submitted comments on the MKARNS 12-foot Channel Deepening Project Draft Supplemental Environmental Assessment (SEA) on March 10, 2024. This comment letter was included as an attachment to their Fish and Wildlife Coordination Act Report letter and incorporates those comments and recommendations by reference. For USACE responses to AGFC recommendations provided during the draft comment period and adopted under their FWCA letter, please see Appendix I, Section 3.2.3.1, Agency Comment Responses.

Recommendations

#1: The Little Rock District staff has indicated that dredging in the Post Canal possibly less than indicated in the SEA. However, the mussel survey for the Post Canal is 25 years old, and Fat Pocketbook have been collected nearby at mile 11-12.4 in the White River (BA; page 26). It seems prudent that mussel surveys be performed before any dredging in the lower White River and the Post Canal to ensure endangered mussels are not impacted. It is illegal to purposely kill mussels (AGFC Code 31), and all appropriate precautions should be made to avoid killing mussels. Just as it is illegal to kill hundreds of deer, it is illegal to purposefully kill hundreds of mussels. Mussels should be translocated to prevent killing them, and any accidental killing of mussels should be mitigated for at American Fisheries Society (AFS) fish kill monetary values per individual killed.

USACE Response: **Partially Adopt**. Per policy, USACE can only implement mitigation measures for federally listed species. If it is reasonable to assume that federally listed mussel species including the Fat Pocketbook have existing habitat in areas that will be impacted by dredging or in-water placement of dredge material, mussel surveys prior to construction efforts by a certified entity will be considered. By pursuing a phased approach to ESA consultation, USACE will have greater design details and specifications, opportunity to survey if warranted, and time to coordinate with USFWS and the States ahead of construction efforts in the Post Canal to avoid and minimize impacts to the Fat Pocketbook. Additionally, USACE will work with States to develop and implement BMPs and select feature locations in a way to reduce impacts to non-listed mussel species.

#2: AGFC recognizes that federal navigational servitude may exempt USCAE activities, conducted for the purpose of navigation, from complying with AGFC Code 31.

USACE Response: **Partially Adopt.** While USACE as a federally entity may be exempt from complying with AGFC Code 31, USACE is committed to working with USFWS,

AGFC, and ODWC to avoid and minimize impacts to non-federally listed mussel resources. This includes developing BMPs and working with the design time to adjust project plans/locations if possible to avoid known mussel beds.

#3: AGFC would like to have a better understanding of the monitoring commitments by USACE for sandbar islands as stated in Section 4.5. Failure of sandbar islands pose serious sedimentation risks and water quality issues for downstream areas.

USACE Response: As with any natural or constructed sand bar habitat along a prairie river system, the material can migrate, especially during flooding events like the 2019 flood which altered sandbar habitat and islands along the entire MKARNS system. However, sandbar islands will be located and constructed in a way that requires little maintenance to retain material and avoid excessive erosion.

Since their inception and in line with the Interior Least Tern (ILT) Conservation Plan, sandbar islands located in Oklahoma are monitored throughout the ILT survey period, and occasional habitat assessment trips are executed during the off-season to identify potential issues. The Programmatic Biological Opinion for operating multipurpose projects within the Tulsa and Little Rock Corps Districts, including the MKARNS, states that USACE is responsible for maintaining sandbar islands along the MKARNS system by "providing adequate flows to create and maintain nesting habitat, and/or artificially or mechanically enhancing, constructing, and maintaining nesting habitat." The PBO also states terms and conditions for maintaining suitable habitat for nesting least terns. Historical and current maintenance of the existing sandbar islands has typically included spraying herbicide to control vegetation as well as the mechanical removal of vegetation as needed to ensure islands are suitable for nesting habitat. On rare occasions when maintenance dredging is required near the existing sandbar islands, the dredge material will be beneficially used to add additional material to those islands. The biggest battle is continuously fighting invasive species and maintaining an appropriate vegetation structure that birds will use.

#4: AGFC would like to have more specificity as to how USACE will provide protections to state-listed species as stated in Section 9.1.3.

USACE Response: While USACE is unable to offer the same level of consideration given to species protected under Federal laws, including the Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), and Bald and Golden Eagle Protection Act (BGEPA), our agency is committed to avoiding and minimizing impacts to the greatest extent possible. Through ongoing coordination with the States even after NEPA compliance is complete, we hope to gain insight into locations where State listed species may occur so that construction features can be moved when possible to avoid sensitive resources. Where full avoidance is not possible, USACE has developed a plethora of BMPs to minimize project footprint, impacts to water quality, risks to native vegetation, risks to fish and wildlife (all species, not just Federally protected species), etc. These BMPs will provide some protection to State-listed species, and the States have and will continue to be afforded the opportunity to contribute to the development of additional BMPs. Collaborating with the States on site-specific mitigation plans, including mitigation types, locations, and characteristics, will prioritize mitigation features in a way that would maximize benefits not only to Federally but also State-protected species.

#5: For any activities planned for National Wildlife Refuges, USACE should comply with the National Wildlife Refuge System Administration Act of 1966 for compatibility determinations.

USACE Response: **Partially Adopt.** Prior to anything being built on an NWR, USACE will first see if avoidance measures are possible and if project features can feasibly be constructed elsewhere. If avoidance is not possible and construction on a NWR is necessary, then a compatibility determination will be pursued. However, in the event that the property is USACE fee-owned land, it may be exempt from the National Wildlife Refuge System Administration Act of 1966 for compatibility determinations if the lease agreement allows for USACE to use the property for dredge material placement. Even in this case, USACE will work with NWR staff to identify a placement location that meets disposal criteria while minimizing impacts and risks to the refuge.

#6: AGFC requests that early and frequent coordination occur between USACE, the USFWS, AGFC, and ODWC as the MKARNS 12-foot Channel Deepening Project continues throughout the planned phased approach for construction. As highlighted by the USFWS in their comments dated July 12, 2024, "The uncertainty regarding the specificity and timing of project features identified within the SEA increases this need. This coordination clarifies avoidance and minimization measures and may reduce the need for compensatory mitigation." Included in this letter as an attachment is the 2003 *Agreement Between the US. Fish and Wildlife Service and the U.S. Army Corps of Engineers for Conducting Fish and Wildlife Coordination Act Activities* (Agreement). The Agreement details how FWCA activities should occur between the USFWS and the USACE. While the Agreement does not include the state wildlife agencies, as explained above, FWCA (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) mentions the USFWS and the state wildlife agencies as equals for the review of federal water development projects. AGFC would appreciate USACE following the directions for FWCA activities as outlined in the Agreement and to include AGFC and ODWC along with the USFWS.

USACE Response: **Adopt.** The USACE is committed to consistent coordination with USFWS and the States under the FWCA. Any coordination with USFWS conducted under the FWCA and in line with the 2003 USFWS-USACE Agreement will also be extended to AGFC and ODWC, namely the site-specific mitigation planning meetings that will begin upon execution of a signed FONSI. The SEA identifies potential construction measures, including upland disposal sites, river training structures (new and modified), and dredge areas. Those features identified represent the "worst case scenario" – all options being considered for construction – although not all features are expected to be constructed. While the specific locations and design of these features may be modified slightly as plans become more detailed, the anticipated impacts of the worst-case scenario are identified, analyzed, and disclosed in the SEA, including compensatory mitigation calculations. As plans become more detailed and funding is made available to inform what features would be constructed in each phase, the specific locations and timing of construction efforts will be identified and relayed to agencies. From there, the appropriate compensatory mitigation needed for each construction phase will be developed in coordination with USFWS and the States. Additionally, this coordination would aid in clarifying avoidance and minimization measures that may reduce the need for compensatory mitigation, as stated in the 2003 USFWS-USACE Agreement.

#7: The CAR states throughout that the USACE will work with resource agencies, "… to the maximum/greatest extent practical." AGFC requests documentation from USACE as to what that coordination and planning will be moving forward with pre-construction, construction, and mitigation planning. Short timeframes and milestones should not be used as justification for a lack of coordination and input from state and federal resources agencies.

USACE Response: **Adopt.** As stated, USACE anticipates close coordination with the Service and States not only during the NEPA process but throughout the lifespan of project, including Pre-Construction Engineering and Design, Construction, and Monitoring and Adaptive Management phases. USACE is relying on the Service and States' expertise to inform avoidance and minimization measures as well as compensatory mitigation priorities, locations, success criteria, monitoring, and adaptive management. USACE is currently working with the Project Management team to develop a schedule for anticipated interagency coordination as the project moves forward to ensure early input from agencies on the engineering team's plans, adequate BMPs, and appropriate mitigation in line with the 2003 *Agreement Between the U.S. Fish and Wildlife Service and the U.S. Army Corps of Engineers for Conducting Fish and Wildlife Coordination Act Activities* (Agreement). Once engineering and design milestones are delineated, we can define when agency input on the design plans will occur as well as the corresponding mitigation planning. USACE will come up with a proposed schedule to share with the Service and States for input, but are anticipating meetings directly with the design team to provide feedback on feature locations in sensitive areas as well as mitigation-focused meetings to agree on avoidance measures, BMPs, quantity of compensatory mitigation needed to offset each construction phase's impacts, type and location of mitigation feature, success criteria, and monitoring and adaptive management measures. These targeted meetings will likely begin in Fall 2024.