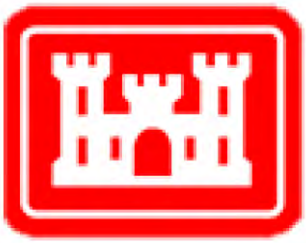
Draft

Biological Assessment

Keystone Lake Dam Safety Modification Study

Arkansas River Basin
Tulsa County, Oklahoma

March 2024



Tulsa District
U.S. Army Corps of Engineers

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Executive Summary

The Regional Planning and Environmental Center of the U.S. Army Corps of Engineers (USACE) is preparing an Environmental Assessment (EA) analyzing the potential environmental impacts resulting from the Keystone Dam Safety Modification Study. In concurrence with the EA, this Biological Assessment (BA) has been prepared to evaluate the impacts of the Proposed Action on Federally listed threatened and endangered species. The submission of the BA will be completed in accordance with Section 7 of the Endangered Species Act (ESA) of 1973.

The Proposed Action includes a Keystone Dam embankment raise, service spillway modification, and service spillway stilling basin modification. The action area is located within USACE fee-owned property. The action area has varying levels of environmental impact because of the existing habitat types. Areas located within the action area will be converted to urban use for the purposes of human health and safety.

“No effect” is expected for piping plover (*Charadrius melodus*), monarch butterfly (*Danaus plexippus*), and red knot (*Calidris canutus*). These species are not expected to utilize the degraded wetland areas immediately surrounding the Keystone Dam.

A “May Affect, but is Not Likely to Adversely Affect” determination is expected for the American burying beetle (*Nicrophorus americanus*), tricolored bat (*Perimyotis subflavus*), and alligator snapping turtle (*Macrochelys temminckii).*

Section 1. Project Background

The purpose of this Biological Assessment (BA) is to address the effects of the Keystone Lake Dam Safety Modification Study (DSMS), otherwise known as the Proposed Action, on species and their designated critical habitat listed under Section 7 of the Endangered Species Act (ESA) of 1973. Keystone Dam was originally authorized by Congress in the Flood Control Act of May 17, 1950 (Project Document SD 107, 81st Congress, 1st Session). The authorized purposes of Keystone Dam are flood risk management, water supply, hydroelectric power, navigation, recreation, and fish and wildlife enhancement. Following authorization, construction of Keystone Dam began in January 1957 and the project was placed in operation in September 1964. The two generating units for hydroelectric power became operational in May 1968.

1.1 Project Location

Keystone Lake is a reservoir in northeastern Oklahoma on the Arkansas and Cimarron Rivers. It is located approximately 15 miles west of downtown Tulsa, Oklahoma (Figure 1). It is a 26,000-acre lake with 16 recreation areas; 11 boat ramps; four marinas; two off-road vehicle areas; five trails; a waterfowl refuge; and thousands of acres of public hunting land.

Figure 1: Overview of Keystone Dam

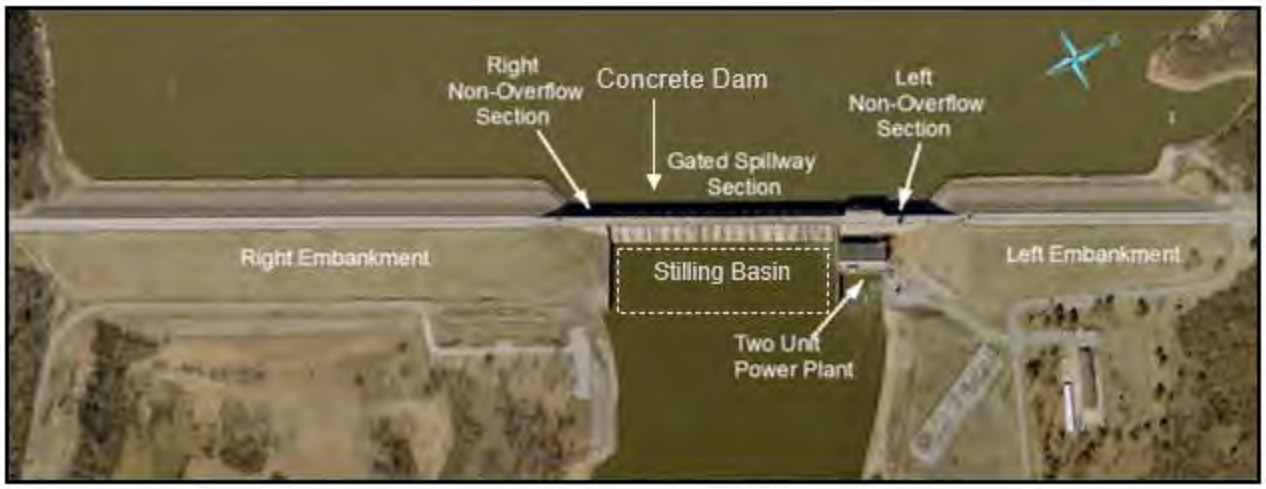

Figure 2: Keystone Dam

1.2 Description of Project Habitat

The major wildlife habitats of Keystone Lake are upland forests, bottomland forests, and tallgrass prairie. The transition zones between these areas are especially productive. Principal wildlife species include bobwhite quail (*Colinus virginianus*), grey and fox squirrels (*Sciurus carolinensis and Sciurus niger*), cottontail rabbits (*Sylvilagus floridanus*), white-tailed deer (*Odocoileus virginianus*), songbirds, waterfowl, wild turkeys (*Meleagris gallopavo*), raccoons (*Procyon lotor*), bobcats (*Lynx rufus*), and various birds of prey, including the bald eagle (*Haliaeetus leucocephalus*).

Three basic vegetation zones can be found in Keystone Lake. The upland forest, Post Oak-Blackjack (Cross Timbers regions) types, represents a mixture of forest and grassland ecosystems characteristic of most of the lake shoreline and recreation areas. The Cross Timbers region is a transition area between the once-prairie, now winter-wheat growing regions to the west, and the forested low mountains of eastern Oklahoma. The Cross Timbers stretch across Oklahoma from north to south, with portions extending into Kansas to the north and Texas to the south,and are sometimes described as containing some of the most extensive tracts of ancient forests in the eastern United States. Included in this ecoregion for Keystone Lake is the Keystone Ancient Forest, with 300-year-old post oaks and 500-year-old cedars. This forest type exists because of its limited commercial value for timber production and is protected through its designation as an Environmentally Sensitive Area by the U.S. Army Corps of Engineers (USACE). Transitional "cross-timbers" (little bluestem grassland with scattered blackjack oak [*Quercus merilandica*] and post oak trees [*Quercus stellata*]) is the native vegetation, and rangeland and pastureland comprise the predominant land cover.

The tall prairie grass vegetation type is a very desirable native grass ecosystem. Better soils in the rolling plains area of the lake support such desirable grasses such as big bluestem (*Andropogon gerardi*), Indian grass (*Sorghastrum nutans*), purple top (*Tridens flavus*), and little bluestem (*Andropogon scoparius*). Unfortunately, at the time of Federal acquisition, virtually no virgin vegetation remained in the area and the quality of existing vegetation was degraded by erosion, fires, and historic overgrazing. However,

50 years of Federal ownership has resulted in beneficial tall prairie grass vegetative succession.

Below Keystone Dam

The vegetation communities below the Keystone Dam can be best described as a mixture of upland and riparian forests, scrub shrub, and grasses, which can then be divided between the Central Irregular Plains and Cross Timbers ecoregions. The inconsistent flow of water from the dam results in an immature riparian forest within the Arkansas River flood zone. Because of this inconsistency, the faster growing grasses, and shrubs thrive on the sandbars in the Arkansas River. However, these communities are easily washed away with a major flood.

There is a mix of undeveloped land, farmland, industry, and urban lands. Upland forests typically dominate in areas that are undeveloped and away from the river. Grasslands and riparian forests dominate the sandy soils below Keystone Dam. Species such as, cottonwood (*Populus deltoides*), black willow (*Salix nigra*), and hackberries (*Celtis occidentalis, Celtis laevigata*) are the dominate species within the river. Within the upland forests the dominate species found include: chinkapin oak (*Quercus muhlenbergii*), post oak (*Quercus stellata*), blackjack oak (*Quercus marilandica*), northern red oak (*Quercus rubra*), winged elm (*Ulmus alata*), white ash (*Fraxinus americana*), persimmon (*Diospyros virginiana*), hickory (*Carya spp*.), cedar (*Juniperus spp*.), hackberry (*Celtis occidentalis*), sugarberry (*Celtis laevigata*), redbud (*Cercis canadensis*), cottonwood (*Populus deltoids*), black willow, and black walnut (*Juglans nigra*) (Guernsey, C.H. and Company, 2005).

1.3 Project Proponent Information

The requesting agency and lead agency is the Department of Defense, U.S. Army Corps of Engineers, Tulsa District.

The point of contact is Eric Larrat, 819 Taylor Street, Fort Worth, Texas 76102; email eric.p.larrat@usace.army.mil; phone number (817) 357-6165.

1.4 Project Purpose and Need

The purpose of the DSMS, including the DSMR and EA, is to evaluate Risk Management Plans (RMPs) and identify a plan to reduce risk associated with Keystone Dam.

The Keystone Dam spillway was originally designed for a maximum discharge of 939,000 cfs based on the original Spillway Design Flood. A recent Inflow Design Flood Update identified that the recommended Probable Maximum Flood (PMF) at Keystone Dam would result in a maximum discharge of 1,218,000 cfs (this includes the use of Tainter gates and flow over the embankment) with some uncertainty in the discharge capacity of the existing gates and overtopping flow.

The Tulsa metro area and adjacent communities is the immediate impact area affected by a failure of Keystone Dam. Tulsa has a population of nearly 400,000 with a metropolitan area population of nearly one million. The city is the second most populous in the state and Tulsa County is also the most densely populated county in the state.

Population projections for the area are anticipated to increase over the next 50 years. Failure of Keystone Dam could result in impacts along the Arkansas River throughout Oklahoma and Arkansas.

Development in the Tulsa area on the southern bank of the Arkansas River is primarily commercial and industrial and includes the Holly Refinery, along with numerous other manufacturing, chemical and oil and gas facilities. The northern bank of the river is marked by a mix of residential, commercial and industrial development. There are also numerous levee systems along the entire Arkansas River.

The greatest life safety risk in the event of a breach would be in the populated areas just below Keystone Dam. As discussed, this area has noteworthy commercial/industrial along with residential development.

Dam Safety Action Classification

USACE has developed a Dam Safety Action Classification (DSAC) system to provide consistent and systematic guidelines to address dam safety issues and deficiencies at USACE projects. The DSAC ratings, which reflect the degree of urgency in taking action, are informed by the probability of failure and incremental risk associated with the project. The classification scale ranges from 1 to 5, with 1 being the most urgent. Keystone Dam is a DSAC 2 (High Urgency) dam. USACE considers this level of life risk to be unacceptable, except in unusual circumstances.

Primary Risk Drivers

An existing conditions risk assessment (ECRA) was conducted for Keystone Dam. This study identified four potential failure modes (PFM)s that were determined to be primary risk drivers for the dam which include:

PFM 30: Overtopping of the Embankment;

PFM 65: Gate Reliability Failure;

PFM 66: Uplift Pressure Causes Failure of Stilling Basin labs; and

PFM 73: Headcutting Failure of the Stilling Basin (Figure 3).

Additionally, PFM 29 scour of embankment into right abutment was evaluated in the modification study and, while not risk driving, opportunities were identified to further lower risk at Keystone Dam by addressing PFM 29.

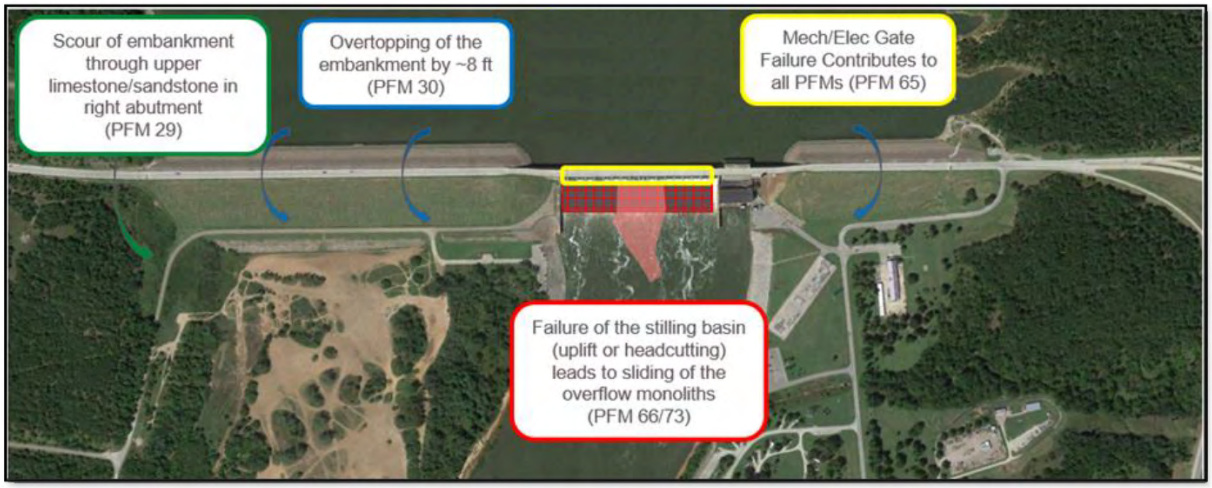

Figure 3: Risk Driving Potential Failure Modes

PFM 30: Overtopping of the Embankment

In this scenario, a significant flood near the PMF and an order of magnitude greater than anything historically observed occurs in the Arkansas River Basin causing the pool to exceed the capacity of the spillway and eventually overtop the dam. The overtopping flows can begin to erode the downstream slope of the dam and create a breach in the earthen structure. The breach can quickly widen causing a rapid increase of water and additional downstream consequences.

PFM 65: Gate Reliability

This failure mode is similar to PFM 30, however in this scenario, the inability to operate one or more of the gates also contributes to the overtopping of the embankment.

PFM 66: Uplift Pressures Fail Stilling Basin Slabs

In this scenario, a flood occurs requiring the spillway to release more water than historically seen. The water pressure on the concrete slabs at the base of the dam during extreme discharge flows could cause failure of the stilling basin slabs. This can lead to erosion of the stilling basin foundation and sliding of the concrete dam.

PFM 73: Headcutting Failure of the Stilling Basin

In this scenario, a flood occurs requiring the spillway to release more water than historically seen (near the PMF). At these very high discharges the stilling basin fails to adequately reduce the energy of the flow resulting in erosion at the end of the stilling basin. This can lead to erosion through the stilling basin foundation and sliding of the concrete dam.

Section 2. Description of Proposed Action

2.1 Tentatively Selected Plan

Based on the comparison of the final array of plans, the TSP is RMP 5a (Dam Raise with Modification of the Existing Stilling Basin). This plan meets study objectives of

addressing dam safety issues and deficiencies; defining, estimating, and communicating risk; addressing non-breach and incremental risk through permanent flood risk management measures; and reducing incremental dam safety risk to tolerable levels. This alternative also avoids or minimizes impacts to the ecological resources and human environment in the project area. Implementation of the TSP is temporary in duration and limited in spatial extent and is not anticipated to impact the overall project area.

The features of work of RMP 5a include (Figure 4):

- Modify existing service spillway
  - Demolish existing spillway bridge
  - Construct concrete baffle
  - Construct new spillway bridge
  - Construct dam raise and parapet wall
- Construct embankment raise (earthen/parapet wall combination)
- Modify existing service spillway stilling basin
  - Construct stilling basin divider walls, cofferdam, basin dewatering system, and instrumentation
  - Stabilize right training wall with anchors
  - Install 2 ft slab overlay (continuous reinforcement and water stops) with post-tensioned anchors in stilling basin
  - Remove and replace existing baffle blocks and strengthen endsill

Figure 4: Risk Management Plan 5a

Dam Raise

The embankment will be raised by approximately 10.5ft, along with the bridge (Highway [HWY] 151) over the spillway. Dam embankment material will be excavated to tie the dam raise into the existing impervious fill zone of the embankment. A hydraulic baffle will be constructed across the face of the existing spillway to protect the Tainter gates and superstructure during pool elevations greater than the original design elevation (766 ft NGVD20). Additional details regarding excavation elevations will be determined during the Preconstruction, Engineering, and Design (PED) Phase.

Tree Removal

The general schedule for tree removal will not be known until award of a contract. However, it should be noted that shrub and/or tree removal will follow all applicable laws and regulations including the Migratory Bird Treaty Act and the Endangered Species Act.

There are no major large-scale tree removal efforts anticipated for the Proposed Action.

The stressors for this activity include:

- Plant Features
    - Decrease in vegetation
    - Increase in invasive plant species (native and non-native)
- Soil and Sediment
    - Increase in dust
    - Increase in soil compaction
- Human Activities
    - Increase in noise
    - Increase in soil disturbance

Staging Area Construction

Staging area construction will be required to implement the Proposed Action.

The stressors for this activity include:

- Plant Features
    - Decrease in vegetation
    - Increase in invasive plant species (native and non-native)
- Soil and Sediment
    - Increase in dust
    - Increase in soil compaction
- Human Activities
    - Increase in noise
    - Increase in soil disturbance

Figure 5: Proposed Locations for Staging Areas

Figure 6: Proposed Concrete Batch Plant Location

Excavation, Grading, and Contouring

This activity is expected to occur with implementation of the Proposed Action. Areas associated with potential grading and contouring can be expected within construction areas identified on the Keystone Dam embankment, staging, laydown, and haul routes.

The stressors for grading, and contouring include:

- Plant Features
  - Decrease in vegetation
  - Increase in invasive plant species (native and non-native)
- Landform (Topographic) Features
  - Change in topography
- Soils and Sediment
  - Increase in dust
  - Increase in soil compaction
- Environmental Processes
  - Increase in surface runoff
- Human Activities
  - Increase in noise
  - Increase in soil disturbance

Construct Cofferdam

This activity is expected to occur immediately downstream of Keystone Dam. Cofferdams will be necessary to ensure the existing service spillway and spillway stilling basin modifications will be protected from flows from the dam. It is expected stream flow will continue to be released from the lake; however, the flows will be modified to accommodate the construction. The exact timing and releases are not known at this point in time, but the adjustment is not expected to adversely affect aquatic species downstream.

The stressors for constructing a cofferdam include:

- Change in Channel Morphology
- Increase in Water Turbidity
- Change in Stream Flow

Section 3. Anticipated Environmental Stressors

This section describes the anticipated effects of the project on the aspects of the land, air, and water that will occur due to the activities above. These are based on the activity deconstructions done in the previous section and will be used to inform the action area.

3.1 Animal and Plant Features

Individuals from the Animalia kingdom, such as raptors, mollusks, and fish. This feature also includes byproducts and remains of animals (e.g., carrion, feathers, scat, etc.), and animal-related structures (e.g., dens, nests, hibernacula, etc.).

Individuals from the Plantae kingdom, such as trees, shrubs, herbs, grasses, ferns, and mosses. This feature also includes products of plants (e.g., nectar, flowers, seeds, etc.).

Decrease in Vegetation

There is not a large-scale decrease in vegetation expected for the Proposed Action, except where applying base to stabilize the site for the concrete batch plant, staging, laydown, and haul routes which would impact non-native grasses and impervious surfaces.

Increase in Invasive Plant Species

Decrease in vegetation can lead to an increased rate of invasive species spread due to open areas. Increase in invasive plant species could occur in any upland forest habitats impacted by tree clearing. In addition, spread of invasive species in the project area would occur due to natural occurrences such as wind and animal movement. The decrease in vegetation has the potential to occur on newly disturbed sites for construction of the Proposed Action.

3.2 Aquatic Features

Bodies of water on the landscape, such as streams, rivers, ponds, wetlands, etc., and their physical characteristics (e.g., depth, current, etc.). This feature includes the groundwater and its characteristics.

Change in Channel Morphology

Construction of a cofferdam below Keystone Lake is likely to cause changes in channel morphology. Placement of material for the structure can alter riverine habitats. However, it is expected those impacts would be negligible because the habitat around the dam is highly degraded from construction and general maintenance of the structure. Temporarily, this will cause decreases in cover, foraging, breeding, and spawning habitat for fish and other aquatic life while the work is conducted within the dam structures.

3.3 Environmental Quality Features

Abiotic attributes of the landscape (e.g., temperature, moisture, slope, aspect, etc.).

Increase in Water Turbidity

An increase in suspended particulates turbidity levels may occur if significant flows are released from the dam during a large flood event. This stressor has the potential to occur downstream of the cofferdams.

3.4 Soil and Sediment

The topmost layer of earth on the landscape and its components (e.g., rock, sand, gravel, silt, etc.). This feature includes the physical characteristics of soil, such as depth, compaction, etc.

Increase in Dust

Tree removal is likely to lead to a temporary localized increase in dust within the action areas.

An increase in dust may occur as a result of grading and contouring however, it is assumed USACE will implement BMPs to reduce the overall impacts of dust on air quality.

Increase in Soil Compaction

Soil compaction is likely to occur during construction of the concrete batch plant, staging, laydown, and haul routes.

3.5 Environmental Processes

Abiotic processes that occur in the natural environment (e.g., erosion, precipitation, flood frequency, photoperiod, etc.).

Increase in Soil Runoff

Any grading or contouring of the action area may increase soil runoff.

Best Management Practices can be used to decrease impacts from soil runoff. Any work conducted must be in compliance with the Clean Water Act; therefore, impacts from soil runoff are expected to be negligible.

3.6 Human Activities

Human actions in the environment (e.g., fishing, hunting, farming, walking, etc.).

Increase in Noise

Noise within the action area is expected to occur during construction. The increase in noise for construction around Keystone Dam will be localized.

Best Management Practices can be used to decrease impacts from noise. Any work conducted within the action areas will follow all local, state, and Federal regulations. No nighttime work is expected to occur when constructing the Proposed Action.

3.7 Conservation Measures

The conservation measures listed below will be enacted with the construction of the Proposed Action.

Restoration of Temporary Construction Impacts

There are expected impacts from construction of staging, laydown and haul routes. Any areas impacted will be replanted with native vegetation, unless the area falls within the flood risk management areas typically associated with dam embankments.

Stressors: Decrease in Vegetation, Increase in Invasive Plant Species, Increase in Dust, increase in soil compaction, and increase in soil disturbance.

Best Management Practices

Construction of the Proposed Action described above will require BMPs to ensure there will not be unnecessary adverse impacts resulting from construction work.

Any development near Waters of the U.S. 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.

The use of BMPs such as keeping equipment in good operating condition, proper training, and providing appropriate health and safety equipment would minimize the potential noise impacts associated with the project.

Stressors: Decrease in Vegetation, Increase in Fuel Load, Increase in Invasive Plant Species, Increase in Dust, Increase in Soil Compaction, and Increase in Noise.

Avoidance

Shrubs and trees will be avoided when practicable during construction. If shrub and tree removal cannot be avoided, USACE will follow phasing of activities to occur outside of the migratory bird nesting season and threatened and endangered bat summer roosting season. This conservation measure can be enacted by scheduling any necessary vegetation removal outside of the peak bird breeding and bat roosting season to the maximum extent practicable.

Stressors: Decrease in Vegetation, Increase in Invasive Plant Species, Increase in Dust, Increase in Soil Compaction, and Increase in Noise.

Section 4. Prior Consultation History

The USFWS Information for Planning and Consultation (IPaC) Official Species List was used to identify Federally listed species that may occur within the action area (Consultation Code: 2022-0063961). An updated copy of the IPaC for the project area was requested on January 24, 2024.

During informal consultation in 2020, 2021, 2022; USACE and USFWS identified potential impacts to Federally threatened and endangered species, specifically the American burying beetle (ABB) (*Nicrophorus americanus*) and Northern long-eared bat (NLEB) (*Myotis septentrionalis*). Since the 2022 consultations and IPaC report, the range of the Northern long-eared bat was modified and no longer falls within the project area.

4.1 Other Agency Partners and Interested Parties

The Oklahoma Department of Environmental Quality has been consulted and Elena Jigoulina, e-mail address: elena.jigoulina@deq.ok.gov, is the point of contact for review.

4.2 Other Reports and Helpful Information

A list of the Federally listed threatened and endangered species included in this project area can be found in Attachment A – Oklahoma Ecological Office Threatened and Endangered Species List (USFWS, 2022).

Information regarding the Oklahoma Natural Heritage Inventory (OHNI) for Federally listed threatened and endangered species can be found in Attachment B – Oklahoma Natural Heritage Inventory Occurrences.

Photos taken during the site visit during the habitat surveys can be found in Attachment C – Action Area Photos.

The Final Biological Opinion for the Programmatic Biological Opinion for operating multipurpose projects on the Red River, Arkansas River, Petit Jean River, and the Canadian River from Eufaula Lake to the Arkansas River confluence and all of the McClellan-Kerr Arkansas River Navigation System within the Tulsa and Little Rock Corps Districts (2016) is a pertinent reference. The Final Biological Opinion describes actions associated with Keystone Lake and the “Incidental Take” permits that USACE can utilize.

Section 5. Species Effect Analysis

This section describes, species by species, the effects of the action on listed, proposed, and candidate species, and the habitat on which they depend. In this document, effects are broken down as direct interactions (something happening directly to the species) or indirect interactions (something happening to the environment on which a species depends that could then result in effects to the species). These interactions encompass effects that occur both during project construction and those which could be ongoing after the project is finished. All effects, however, should be considered, including effects from direct and indirect interactions and cumulative effects.

5.1 Tricolored Bat

The Tricolored Bat (TCB) is one of the smallest bats in North America and is easily distinguished by its unique tricolored fur and often appears yellowish to nearly orange.

This species is known to occur across the eastern and central United States. During the winter, tricolored bats are often found in caves and abandoned mines but have been known to roost in culvert pipes and tree cavities. During the rest of the year, TCB are found in forested habitats where they roost in trees, primarily among leaves of live or recently dead deciduous hardwood trees, but may also be found in Spanish moss, pine trees, and occasionally human structures (USFWS 2023b).

Legal Status

The TCB was proposed for listing as endangered on September 13, 2022. The TCB is found across much of the eastern and central U.S., occurring in 39 states. The decline in the TCB population is a result due to the impacts of white-nose syndrome, a deadly disease affecting cave-dwelling bats across the continent. It is estimated that white-nose syndrome has caused a 90 percent decline in affected tricolored bat colonies across the species range.

Recovery Plans

There is not an available recovery plan for the TCB.

Life History Information

The tricolored has a wide range, encompassing forested habitats in the summer and caves and mines (hibernacula) in the winter for hibernation. This species can use other habitats with similar conditions to caves and mines. TCB are able to use a variety of forests and woodlands in the summer and will utilize cavities and crevices in live and dead trees. They do not prefer a single species of tree, as long as there are appropriate conditions for roosting (USFWS, 2024).

TCB exhibit high site fidelity and often return year after year to both the same hibernaculum as well as the same summer roosting locations. TCB are opportunistic, insectivorous feeders and consume small insects, including caddisflies, flying moths, small beetles, small wasps and flying ants, true bugs, and flies. TCB emerge early in the evening and forage at treetop level or above but may forage closer to ground later. Foraging most commonly occurs over waterways and along forest edges. TCB disperse from overwintering habitat to summer roosting habitat in the spring around mid-March and return to winter hibernacula in the fall around mid-November (USFWS, 2024).

Their breeding begins in late summer or early fall. Tricolored bat females will store sperm over the hibernation period. After migration from their winter habitat to summer habitat, females will give birth to usually two pups which will begin to fly around four weeks after being born. The estimated maximum life span for this species is estimated at around 14 years (USFWS, 2024).

Identified Resource Needs

Table 1.Resource Needs for Tricolored Bat (USFWS, 2024)

Resource Need	**Metric**
Hibernacula	Caves or mines with constant warm temperatures around 50°F with high humidity and no air currents.
Summer Habitat (Maternity Roosts)	Presence of live or recently dead deciduous hardwood trees.

Conservation Needs

The USFWS Proposed Listing states that WNS, impacts to hibernacula, loss or degradation of summer habitat, and wind farm operation are the most prominent threats to TCB populations and survival. Overall, most conservation needs are difficult to implement. However, USFWS and its partners are working to minimize mortality through disease management, addressing wind turbine mortality, protecting hibernacula, and listing the species as Federally threatened.

Disease management has been addressed by a plan prepared by USFWS and partners to provide information to state and federal agencies, universities, and non-governmental organizations that will assist these groups with controlling the spread of WNS and addressing the effects caused by the disease (USFWS, 2015a). The USFWS is also working to minimize the impacts of wind turbines through research of bird and bat

migration routes, operation of wind turbines to reduce impacts to birds and bats, and why bats are especially susceptible to wind turbine mortality. A *Midwest Wind Energy Habitat Conservation Plan* is being prepared by Federal and State resource agencies to provide an avenue to wind turbine owners to reduce the adverse impacts caused by their equipment to bat populations (USFWS, 2015a).

In addition to summer habitat protection, winter hibernacula have also been given special consideration by Federal and state agencies. Many important caves and mines have been protected by natural resource agencies and conservation groups to ensure winter habitat are not adversely affected by human disturbance.

Environmental Baseline

Species Presence and Use:

Tricolored Bat, due to their mobility, have the chance to occur within the action area. There are a variety of tree species that may be appropriate for nesting near the Keystone Dam. Any vegetation cleared could adversely impact male and female TCB. Adult species, in the best-case scenario, would disperse from the area. In the worst-case scenario live individuals, including pups, would be harmed by heavy equipment activities or the action of tree removal. However, the measures listed in Section 2.1.1.4 and 2.1.2.2, as well as avoidance of forested habitats shall be implemented during construction of the Proposed Action to avoid take of TCB.

Species Conservation Needs within the Action Area:

Although TCB have a few conservation needs, only the conservation of summer habitat should be applied to the action area. To avoid and minimize direct impacts to TCB, tree removal should be conducted during the winter months (November 16 thru March 31) when bats are hibernating in caves. No known hibernacula or maternity roost trees for TCB occur in the general area.

- Restricted tree removal to winter months (November 15 thru March 31)
- No additional, temporary nighttime lighting without limiting the light beam's focus to the work/staging area.
- 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
- 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.
- 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).

Habitat Condition:

Summer Habitat (Maternity Roosts)

- Potential roosting habitat is the conservation need that has the potential to be affected by the Proposed Action. This area consisted of Cross Timbers habitat with trees between 10- and 20-inches diameter at breast height (DBH). Sites adjacent to the Arkansas River provide important habitat connectivity between roosting and foraging sites. Nearby foraging sites could include habitats prevalent with flying terrestrial insects. It should be noted there is an abundance of this habitat type throughout the USACE fee-owned property. In addition, the action area experiences an abundance in noise and disruption due to the dam structure, traffic, water-based, and terrestrial-based recreation. This action area, has been regularly utilized by SWT.

Influences:

There are no known hibernacula within the action area, so it is assumed that hibernacula will not be influenced by the Proposed Action. There are several factors that can be considered a threat to TCB population; however, none is greater than WNS. If not for WNS, it is presumed that TCB would not be experiencing a dramatic decline in population levels (USFWS, 2016b).

Two common causes of habitat loss are conversion to other land uses and forest modification. Vegetation removal at this site caused a direct loss of forest to another land use type, disposal. Forest conversion is common throughout all states; however, impacts to TCB are most likely to occur at a local scale. The TCB proposed listing has additional information regarding influences to the species within its range.

Additional Baseline Information:

Species specific surveys were not conducted for this the study. However, presence is assumed within the action areas with Cross Timbers habitat.

Effects of the Action

Indirect Interactions:

Table 2. Indirect Interactions on Tricolored Bat

Resource Need	Stressors	Conservation Measures	Amount of Resource Impacted	Individuals Affected
Loss or Degradation of Summer Habitat	Decrease in vegetation	Restoration of Temporary Construction Impacts Avoidance	*Resource that may be affected.* Limited tree removal could have potential for TCB roosting.	*Individuals that may be affected.* Best-case scenario: Pups. Worst-case scenario: All live individuals if conservation measures are not implemented.

Resource Need	Stressors	Conservation Measures	Amount of Resource Impacted	Individuals Affected

Direct Interactions:

Impacts to TCB from tree removal, otherwise known as forest conversion, would be expected to vary depending on the timing, location (within or outside TCB home range), and extent of removal. While bats can flee during tree removal, removal of occupied roosts (during spring through fall) may result in direct injury or mortality to some percentage of TCB. This percentage would be expected to be greater if flightless pups or inexperienced flying juveniles were also present. Given the low inherent reproductive potential of TCB (two pups per female per year), death of adult females or pups or both during tree felling could reduce the long-term viability of some of the WNS-impacted colonies if they are also in the relatively small percentage of forest habitat directly affected by forest conversion.

Cumulative Effects:

Climate change, in combination with drought cycles, is likely to exacerbate existing threats to all species within the southwestern United States.

The ODOT is proposing an MKARNS Mooring Modernization Project. This project will allow the replacement of existing structures that were not designed for extreme flood events, enhance harbor safety by eliminating damage to infrastructure due to loose barges, expand the capacity for vessels within the waterway, and prepare ports for increased freight demand within the MKARNS (ODOT, 2020). The project is expected to be completed in 2027.

Implementation of the 2005 Arkansas River Navigation Study: Section 309 of the Water Resources Development Act of 2020 stated that “Any Federal funds, regardless of the account from which the funds were provided, used to carry out construction of the modification to the McClellan-Kerr Arkansas River Navigation System, authorized in Section 136 of the Energy and Water Development Appropriations Act, 2004 (117 Stat. 1842), shall be considered by the Secretary as initiating construction of the project such that future funds will not require a new investment decision.”

Implementation of the Tulsa-West Tulsa levee repair project downstream of Keystone Dam. This project was authorized by Section 1202 of the Water Infrastructure Improvements for the Nation Act (WIIN Act of 2016, Public Law 114-322), the study is an integrated feasibility report and environmental assessment completed by the U.S. Army Corps of Engineers (USACE), Tulsa District (SWT). This project entails repairing a large portion of the 20 miles of earthen levees along the left and right bank of the Arkansas River that were constructed by USACE in the mid-1940s as authorized in the 1941 Flood Control Act to protect residential and industrial property from frequent flooding along the Arkansas River and associated tributaries in the City of Tulsa and the City of Sand Springs (an incorporated area adjacent to the City of Tulsa). This levee system extends from Sand Springs downstream along the Arkansas River to Tulsa. Keystone Dam is about 8 miles above Tulsa, and flood discharges from Keystone have

direct and substantial impacts to the levee system. This project is fully funded with construction anticipated to start in FY2025-26.

Discussion and Conclusion

Because the TCB is listed as a proposed endangered species, the effect determination is based on whether or not the action is expected to appreciably reduce the reproduction, numbers, or distribution of the species. Since the action is expected to have a low potential for encounter of the TCB and conservation measures are in place to avoid take, the action would have no measurable impact on the status of the species and therefore is not likely to jeopardize the continued existence of the species. If the species is listed prior to project completion, the direct and indirect effects of the proposed action May Affect, but is Not Likely to Adversely Affect the TCB. If necessary, the USACE will follow all appropriate processes to ensure the handling of TCB is compliant with the ESA.

5.2 Piping Plover

The piping plover (*Charadrius melodus)* is a migratory shorebird listed as endangered in the watershed of the Great Lakes and threatened in the remainder of its range (the Northern Great Plains, Atlantic coast, Gulf coast, the Bahamas, and the West Indies) (USFWS, 1985). The Northern Great Plains population of piping plover spends up to 10 months a year on its wintering ground along the Gulf coast and arrives on prairie breeding grounds in early May. During migration periods, they use large rivers, reservoir beaches, mudflats, and alkali flats (Haig, 1986). They feed on aquatic and terrestrial invertebrates. The migration and wintering period may last as long as 10 months (mid-July through mid-May). Migration to breeding grounds may occur from mid-February through mid-May, with peak migrations in March. Wintering piping plovers forage on invertebrates located on top of the sand or just below the surface along wrack lines (organic material including seaweed, seashells, driftwood, and other materials deposited on beaches by tidal action). Specific prey items may include polychaete marine worms, crustaceans, fly larvae, beetles, and bivalve mollusks (USFWS, 2012a).

This species is considered a migrant through the Oklahoma action area. This species has been documented using the Great Salt Plains NWR in Oklahoma as stopover habitat during migration; however, it is thought that many individuals fly nonstop to the Gulf Coast from breeding grounds to the north.

Due to impoundment and channelization, virtually no piping plover nesting habitat occurs in the action area. No portion of the action area has been designated as critical piping plover habitat. Piping plovers are a transient species that rarely occur in the action area during migration between wintering grounds and breeding areas. Due to the lack of suitable nesting habitat in in the action area, dredging and disposal and the proposed conservation measures are not likely to affect piping plover populations or their nesting habitat. Any direct, indirect, or cumulative effects from project actions would have “No Effect”.

5.3 Red Knot

The red knot (*Calidris canutus*) is a medium to large shorebird with a weight of five ounces, a body length of nine to 10 inches, and a wingspan of 20 to 22 inches. During the breeding season, it has a rust-colored face, chest, and undersides, and dark brown wings. In winter, it has a gray head, chest, and upperparts and a white belly. It has long greenish legs and a pointed black bill. Males and females look similar, and juveniles resemble nonbreeding adults.

The red knot was listed as threatened on December 11, 2014 (79 FR 73706). The greatest threat to the red knot population is habitat loss in the U.S., followed by reduction of preferred prey items in nesting areas and along migration routes (USFWS, 2014). The red knot breeds in tundra habitat of the central Canadian arctic, between May and mid-July, and winters along the U.S. coastline from North Carolina to Texas and south to Tierra del Fuego in South America between July and May; however, non-breeding red knots are known to remain in Texas year-round. Wintering habitat includes tidal flats, beaches, and oyster reefs, where they feed primarily on small invertebrates, particularly clams (Newstead, 2012; Newstead et al., 2013; USFWS, 2011a). Long-term systematic population surveys are lacking for this species, but current estimates suggest Texas wintering populations may range between 50 and 2,000, with numbers increasing from survey counts in the early 1990s to recent counts in 2012. The increase in numbers does not necessarily reflect an increase in the population but may be due to an increase or variation in survey effort. Although rigorous population estimates are lacking, preliminary trends indicate prolonged decline followed by stabilization of small populations (USFWS, 2014).

Due to impoundment and channelization, virtually no red knot nesting habitat occurs in the action area. No portion of the action area has been designated as critical red knot habitat. Red knots are a transient species that rarely occur in the action area during migration between wintering grounds and breeding areas. Any direct, indirect, or cumulative effects from project actions would have “No Effect.”

5.4 American Burying Beetle

The ABB is the largest species of its genus in North America measuring from 0.98 to 1.4 inches in length. It has a shiny black body with smooth and shiny black elytra with bright orange-red markings. The antennae are large, abruptly clubbed, and orange at the tip. It is a member of the Family Silphidae, which are known as the carrion or burying beetles due to their behavior of burying vertebrate carcasses which are used for brood chambers for their young (USFWS, 1991).

Status of the Species

Once widely distributed throughout eastern North America, this species has disappeared from most of its former range. The ABB was listed by the Service as endangered under the Endangered Species Act of 1973, as amended, on July 13, 1989 (54 FR 29652). This species was then downgraded from endangered to threatened on November 16, 2020 (85 FR 6524). No critical habitat was designated for this species.

Legal Status

The ABB is federally listed as 'Threatened' and additional information regarding its legal status can be found on the ECOS species profile.

Recovery Plans

Available recovery plans for the ABB can be found on the ECOS species profile.

Life History Information

This species was formerly known from much of eastern North America with its historical range described as being most of temperate eastern North America. Historically, its range included 35 states in the eastern and central United States and the southern edges of Canada. The easternmost record for the species is from Nova Scotia in Canada and the westernmost record is from central Montana. The northernmost record is from the upper peninsula of Michigan and the southernmost record is from Kingsville, Texas. More recently, it has been documented from Arkansas, Kansas, Kentucky, Missouri, Nebraska, Oklahoma, and Rhode Island. Presently, the current distribution encompasses eight states including Nebraska, Kansas, Arkansas, Rhode Island, Massachusetts, South Dakota, Texas and Oklahoma (USFWS, 1991). In Oklahoma, this species was originally thought to occur in only Latimer, Cherokee, Muskogee, and Sequoyah counties. More recently, it has been discovered in over 20 counties in Oklahoma including Atoka, Bryan, Cherokee, Choctaw, Coal, Craig, Haskell, Hughes, Johnston, Latimer, LeFlore, McCurtain, McIntosh, Muskogee, Okfuskee, Osage, Pittsburg, Pushmataha, Rogers, Sequoyah, Tulsa, and Wagoner (USFWS, 1991).

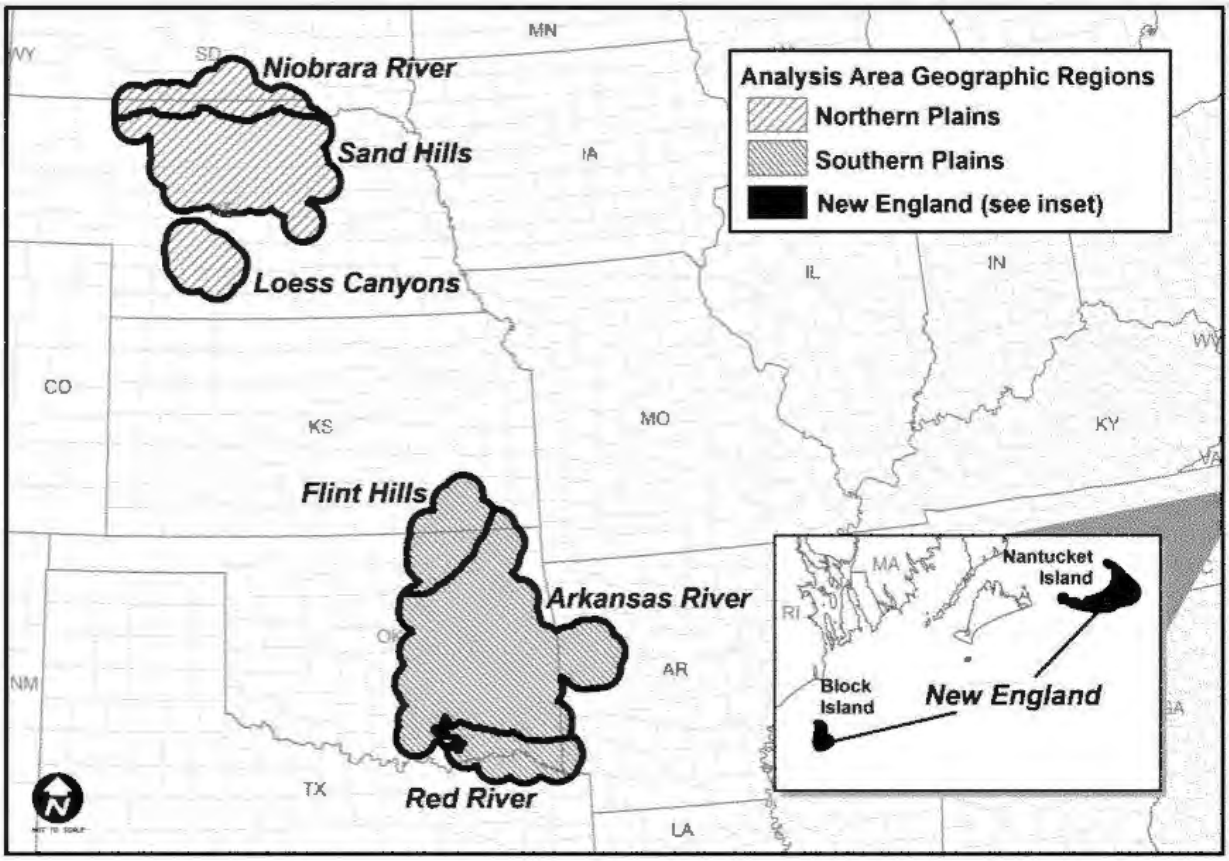

Figure 7: Distribution of American Burying Beetle (USFWS, 2019a)

The most stable populations occur in Arkansas, Oklahoma, and Rhode Island. In Latimer County, Oklahoma, the populations are found on private holdings. The Muskogee and Cherokee counties population occurs primarily on Federal lands licensed to the Oklahoma Army National Guard and the Oklahoma Department of Wildlife Conservation. The Arkansas populations occur on Federal lands including the Fort Chaffee Military Reservation, the Ozark National Forest, and the Ouachita National Forest. Given the mobility of this species, it is likely these represent a single population of this species.

Identified Resource Needs

Table 3. Identified Resource Need for American Burying Beetle

Resource Need	Metric
Carrion	Between the size of a dove or chipmunk
Habitat	Wide array of terrestrial-based habitat types

Conservation Needs

Conservation efforts have been enacted by USFWS to aid in the understanding of the life history of ABB and promote its recovery. These needs include publicizing the decline of ABB populations, soliciting information on collection records, studies on the reproductive ecology and population status in the field and in labs, investigating the causes of the species' decline, establishing captive breeding populations, surveying historical collection localities and de novo surveys, and the reintroducing captive raised beetles to historical habitat (USFWS, 1991)

Environmental Baseline

Species Presence and Use:

The typical habitat types ABB use include oak-pine woodlands, open fields, oak hickory forests, open grasslands, and edge habitat. In Oklahoma, the habitat types where populations have been documented to occur vary from deciduous and coniferous forests to open pasture. The topography includes slopes, ridge tops and flat grasslands. The OHNI performed surveys in a large area of western Cherokee and eastern Muskogee Counties, Oklahoma. Three different habitat types were surveyed; oak-hickory forest (second and third growth), grassland, and bottomland hardwood forest. Slightly more individuals were collected in grasslands than in oak-hickory forests and fewer still were captured in the bottomland forest (Kozol et al., 1989).

With the wide distributional pattern of the species with respect to habitat types, it does not appear likely that vegetation and soil type are limiting factors. The beetle has been collected from mature virgin forests, open pastureland, and grasslands. While certain types of soil conditions are not suitable for carcass burial (such as very xeric, saturated, or loose sandy soils), the availability of appropriate carrion appears to be more of a limiting factor (Raithel, 1991). It is assumed due to their wide range of habitat types and mobility; they are likely to occur in all land-based action areas.

Given the mobility of this species, it is highly probable that it does, at times, occur on periphery areas of Keystone Dam if suitable habitat and carrion are present. Because RMP 5a will directly affect upland sites during construction there is potential for loss of habitat for this species. Therefore, activities associated with the Proposed Action may affect this species.

Species Conservation Needs Within the Action Area:

Conservation needs within the action area include pre-surveying and removing ABB from sites before implementation of construction.

Habitat Condition:

Natural Food Source (Carrion the size of a dove or a chipmunk)

- It is unknown the exact quantity of natural food sources for the ABB within the action area. However, it can be assumed wildlife such as mice, squirrels, and small birds are present. Adjacent areas are abundant with leaf litter, vines, and trees between 10 and 20 inches DBH. It can be assumed appropriate carrion for ABB are present within the action area. Any invertebrates at a site have the likelihood of attracting small birds, amphibians, and reptiles.

Influences:

The reason for decline of ABB population are not known. Some of the more widely accepted reasons include: direct habitat destruction through fragmentation, habitat loss, pesticides, predation or species-specific disease, interspecific Nicrophorus competition, and outdoor lighting (USFWS, 1991).

Additional Baseline Information:

Species specific surveys were not conducted for this the study. American Burying Beetle occupancy of scrub-shrub, uplands, and non-native grasslands is assumed due to the presence of suitable habitat.

The USACE has conducted surveys for ABB on several projects with negative results. Surveys have been conducted at selected areas at Keystone Lake, along Mingo and Fry creeks, Hugo Lake, Wister Lake, Fall River Lake, and Robert S. Kerr Pool. However, these surveys were completed for small areas where minor construction activities were proposed and did not include a survey of the entire project.

Effects of the Action

Indirect Interactions:

Table 4. Indirect Interactions on American Burying Beetle

Resource Need	Stressors	Conservation Measures	Amount of Resource Impacted	Individuals Affected
Natural food sources (carrion the size of a dove or a chipmunk)	Decrease in vegetation Increase in invasive plant species Increase in Dust Increase in Soil Compaction Increase in Noise Increase in Soil Disturbance	Best Management Practices	Approximately 10 acres of maintained non-native grasses and impervious surfaces.	*Individuals that may be affected.* Construction activities and related habitat disturbance may temporarily reduce local rodent populations that would provide carrion for ABBs. Destruction and alteration of vegetation through clearing, grading, and contouring can also reduce local rodent and bird populations that provide carrion. These effects are temporary until vegetation can be reestablished. These indirect effects have the potential to impact individual ABBs, eggs, or larvae.

Direct Interactions:

Any ABB present during construction of staging, laydown, and haul routes (10 acres) would, at best-case scenario, be dispersed from the area. In the worst-case scenario, live individuals would be harmed or killed by heavy equipment activities or the action of vegetation clearing.

Activities associated with construction of this Proposed Action are not expected to result in the direct mortality of individual ABBs or broods because the surfaces are regularly maintained or impervious.

Cumulative Effects:

Climate change, in combination with drought cycles, is likely to exacerbate existing threats to all species within the southwestern United States.

Overall land use changes around Keystone Lake can be considered a cumulative effect. Private land use can lead to the conversion of suitable habitats for ABB or can cause the slow degradation of these habitats. A decline in areas with appropriate native vegetation can reduce the availability of carrion species for ABB.

Implementation of the 2005 Arkansas River Navigation Study: Section 309 of the Water Resources Development Act of 2020 stated that “Any Federal funds, regardless of the account from which the funds were provided, used to carry out construction of the modification to the McClellan-Kerr Arkansas River Navigation System, authorized in Section 136 of the Energy and Water Development Appropriations Act, 2004 (117 Stat. 1842), shall be considered by the Secretary as initiating construction of the project such that future funds will not require a new investment decision.”

Implementation of the Tulsa-West Tulsa levee repair project downstream of Keystone Dam. This project was authorized by Section 1202 of the Water Infrastructure Improvements for the Nation Act (WIIN Act of 2016, Public Law 114-322), the study is an integrated feasibility report and environmental assessment completed by the U.S. Army Corps of Engineers (USACE), Tulsa District (SWT). This project entails repairing a large portion of the 20 miles of earthen levees along the left and right bank of the Arkansas River that were constructed by USACE constructed in the mid-1940s as authorized in the 1941 Flood Control Act to protect residential and industrial property from frequent flooding along the Arkansas River and associated tributaries in the City of Tulsa, Oklahoma and the City of Sand Springs (an incorporated area adjacent to the City of Tulsa). This levee system extends from Sand Springs downstream along the Arkansas River to Tulsa. Keystone Dam is about 8 miles above Tulsa, and flood discharges from Keystone have direct and substantial impacts to the levee system. This project is fully funded with construction anticipated to start in FY2025-26.

Unavoidable pool drawdown resulting from the barges sinking and crashing into the Webbers Falls Pool Lock and Dam, leading to substantial environmental and economic impacts to the MKARNS in May 2019. ABB were adversely affected during the effort associated with dredging and disposal of sediment caused by flooding in 2019. There was a permanent loss of 10 acres of bottomland hardwood, 31.4 acres of emergent wetland, and 2.4 acres of forested wetland habitat that may have been suitable for ABB.

Discussion and Conclusion

Determination: “May Affect, Not Likely to Adversely Affect”

Given the mobility of this species and the limited sampling that has occurred, it is reasonable to assume that it is present in suitable habitats. However, the habitat

associated with areas of impact are not expected to be suitable for ABB because they are disturbed, maintained, or impervious surfaces.

5.5 Monarch Butterfly

The monarch butterfly is one of the most recognizable species in North America with its iconic orange and black markings. During the breeding season, monarchs lay their eggs on their obligate milkweed host plant (primarily Asclepias spp.) and larvae emerge after two to five days. Larvae develop through five larval instars (intervals between molts) over a period of nine to eighteen days, feeding on milkweed and sequestering toxic cardenolides as a defense against predators. The larva pupate into chrysalis before emerging six to fourteen days later as an adult butterfly. There are multiple generations of monarchs produced during the breeding season, with most adult butterflies living approximately two to five weeks; overwintering adults enter into reproductive diapause (suspended reproduction) and live six to nine months (USFWS, 2022b).

Adult monarch butterflies during breeding and migration require a sufficient quality and quantity of nectar from nectar blooming resources, which they feed on throughout their migration routes and at their breed grounding (spring through fall). Monarchs also need healthy and abundant milkweed (for both oviposition and larval feeding) embedded within this diverse nectaring habitat. Many monarchs use a variety of roosting trees along the fall migration route. The size and spatial arrangement of habitat patches are generally thought to be important aspects but is not well understood. There is not critical habitat designated for the monarch butterfly (USFWS, 2022b).

Milkweed is a large factor in maintaining monarch butterfly populations. Milkweed is most likely to occur in agricultural fields, roadsides, and prairies. Although monarch butterflies are expected to occur within the action area, they will not be affected by the implementation of the Proposed Action due to the lack of appropriate habitat for milkweed to occur. Any direct, indirect, or cumulative effects from implementation would have “No Effect” on monarch butterfly.

5.6 Alligator Snapping Turtle

The alligator snapping turtle (AST) is the largest freshwater turtle in North America. Adult males can reach up to 29 inches long and can weigh up to 249 pounds. The alligator snapping turtle is identifiable by its gray/brown inner mouth with black splotches; it’s tremendously long tail; large, curved beak; triangle-shaped head; and a rough brown shell with three spine rows. Alligator snapping turtles are known to eat a wide range of plants and animals. However, their primary prey is fish which they hunt for by sitting on the bottom and using a worm like appendage to lure prey (USFWS 2023).

The alligator snapping turtle can be found throughout freshwater systems. It generally prefers deeper beds of rivers and lakes where it can stay submerged for up to 50 mins while it hunts for prey (Smithsonian). During breeding, females will travel to sandy shores to lay their clutches of eggs.

The Alligator snapping turtle was federally listed as proposed threatened on November 15, 1994. Currently, this species is known to or is believed to occur in Alabama, Arkansas, Florida, Georgia, Illinois, Kansas, Kentucky, Louisiana, Mississippi, Missouri,

Oklahoma, Tennessee, and Texas. The main causes for the decline in population of this species is a result of historic overharvesting, water pollution, bycatch from fishing gear, and extensive habitat alteration.

Due to the channelized nature and strong currents associated with the river just below the dam, it is unlikely that AST would be present within the action area. Additionally, given the mobility of the species it is likely that should AST be present, they would vacate and avoid the area during construction activities. As a result, it is assumed that the proposed action May Affect, is Not Likely to Adversely Affect AST.

However, considering the AST is currently only a Proposed species, Part 402 of the ESA, Section 402.10 – Conference on Proposed Species or Proposed Critical Habitat requires each federal agency to confer with the USFWS on any action which is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat. The proposed project is unlikely to jeopardize the continued existence of the AST because direct and indirect effects are localized to the immediate project area and not expected to affect upstream or downstream, thereby having no effect on AST outside of the immediate area.

Section 6. Critical Habitat Effects Analysis

There are no critical habitats within the action areas; therefore, none will be affected.

Section 7. Summary Discussion, Conclusion, and Effect Determinations

7.1 Effect Determination Summary

The Proposed Action was evaluated, and the effects determined in accordance with the ESA. Potential direct, indirect, and cumulative impacts identified are summarized, by species, below and in Section 4.2.

Table 5. Effect Determination Summary

Species (Common Name)	Scientific Name	Listing Status	Present in Action Area	Effect Determination
Tricolored Bat	*Perimyostis subflavus*	Threatened	No	No Jeopardy; if listed May Affect, Not Likely to Adversely Affect
Piping Plover	*Charadrius melodus*	Threatened	No	No Effect
Red Knot	*Calidris canutus rufa*	Threatened	No	No Effect
American Burying Beetle	*Nicrophorus americanus*	Threatened	Yes	May Affect, Not Likely to

				Adversely Affect
Monarch Butterfly	*Danaus plexippus*	Candidate	No	No Effect
Alligator Snapping Turtle	*Macrochelys temminckii*	Proposed Threatened	Yes	No Jeopardy; if listed May Affect, Not Likely to Adversely Affect

7.2 Summary Discussion

The finding of "No Effect" for the above-listed species was based on several considerations. For some, their range is within the larger regional or county-wide areas but does not encompass the specific action areas because habitat or other ecological needs are not sufficient to support their presence. Other species may have previously occurred in the specific action areas but no longer occur there because of similar limitations. For above-listed species that may occur in or near the action areas the potential impacts from ongoing or proposed USACE actions were considered inconsequential.

This assessment further concludes that the Proposed Action's direct, indirect, and cumulative effect "May Affect, but is Not Likely to Adversely Affect" the TCB. Although suitable habitat may be present, it is likely the range of the bat is not included in the action areas based on regional maps, recovery plans, and information collected from OHNI. In addition, conservation measures discussed in Section 2 shall be implemented with any tree clearing activities.

In addition to these determinations, USACE has concluded the Proposed Action's direct, indirect, and cumulative effects "May Affect, and Not Likely to Adversely Affect" the ABB. Because the construction sites are terrestrial-based, but are heavily disturbed it is not expected there will be take of ABB.

Finally, USACE has concluded the Proposed Action's direct, indirect, and cumulative effects "May Affect, and Not Likely to Adversely Affect" the AST. Because the lack of preferred habitat within the project area and the mobility of the species, it is not expected there will be take of AST.

7.3 Conclusion

The project will have "No Effect" on piping plover, red knot, and monarch butterfly. The project "May Affect, but is Not Likely to Adversely Affect" TCB, ABB, and AST. There will be no impacts to critical habitat resulting from the Proposed Action.

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ATTACHMENT A

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129-1428
Phone: (918) 581-7458 Fax: (918) 581-7467

In Reply Refer To:
Project Code: 2022-0063961
Project Name: Keystone DSMS - Refined

January 24, 2024

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

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

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

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

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

This species list is provided by:

Oklahoma Ecological Services Field Office
9014 East 21st Street
Tulsa, OK 74129-1428
(918) 581-7458

PROJECT SUMMARY

Project Code: 2022-0063961
Project Name: Keystone DSMS - Refined
Project Type: Dam - Maintenance/Modification
Project Description: Keystone DSMS Study Area
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.149657651748484,-96.25304279652008,14z

Counties: Osage and Tulsa counties, Oklahoma

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

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

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

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

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

MAMMALS

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Rufa Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

REPTILES

NAME	STATUS
Alligator Snapping Turtle *Macrochelys temminckii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4658	Proposed Threatened

INSECTS

NAME	STATUS
American Burying Beetle *Nicrophorus americanus* Population: Wherever found, except where listed as an experimental population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/66	Threatened
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

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

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

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

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE

SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

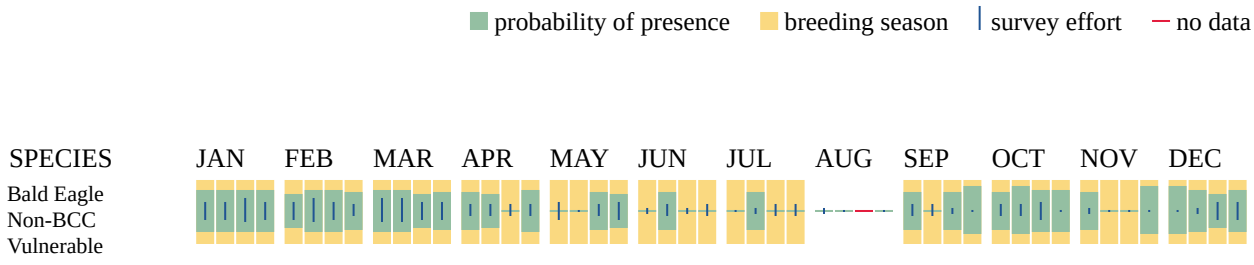
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management

- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Little Blue Heron *Egretta caerulea* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9477	Breeds Mar 10 to Oct 15

NAME	BREEDING SEASON
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

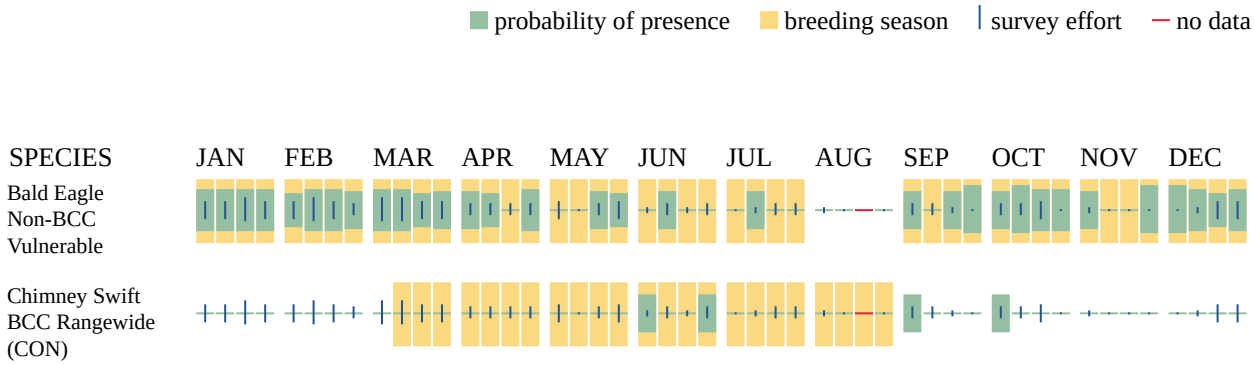
Probability of Presence (■)

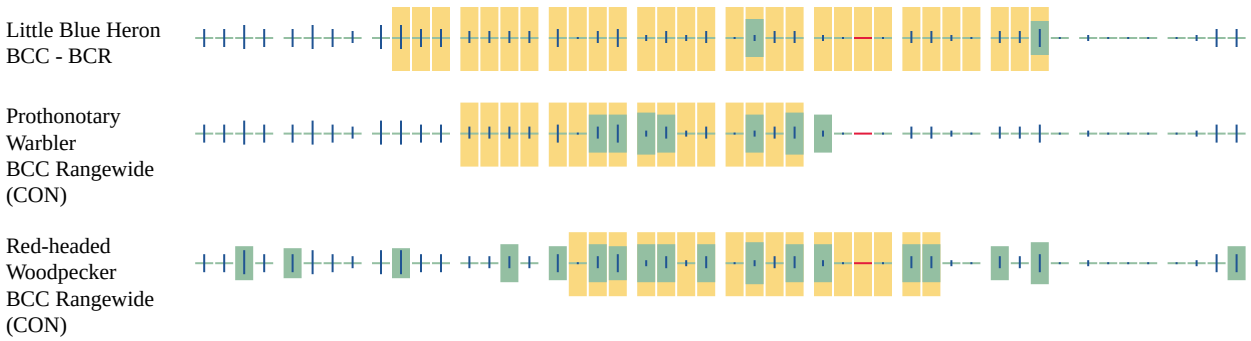
Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.





Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

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

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

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

FRESHWATER POND

- PUBFx
- PAB4Hh

RIVERINE

- R5UBF
- R2USA
- R2UBH
- R4SBC

LAKE

- L1UBHh

- L2USCh

FRESHWATER EMERGENT WETLAND

- PEM1A

IPAC USER CONTACT INFORMATION

Agency: Department of Defense
Name: Eric Larrat
Address: 819 Taylor St
City: Fort Worth
State: TX
Zip: 76102
Email eric.p.larrat@usace.army.mil
Phone: 8173576165

ATTACHMENT B

OBS Ref. 2024-115-FED-ACE

Dear Eric Larrat, February 27, 2024

We have reviewed occurrence information on federal and state threatened, endangered, or candidate species currently in the Oklahoma Natural Heritage Inventory database for the following location you provided:

Sec. 4 and 9-T19N-R10E, Tulsa County

We found 13 occurrences of relevant species within the vicinity of the project location as described.

Species Name	Common Name	Federal Status
Notropis girardi	**Arkansas River shiner**	**Threatened**
County	***TRS***	***Count***
Tulsa	Sec. 4-T19N-R10E	2
Tulsa	Sec. 9-T19N-R10E	1
Pawnee	Sec. 31-T20N-R10E	3
Haliaeetus leucocephalus	**Bald Eagle**	**Protected**
County	***TRS***	***Count***
Tulsa	Sec. 9-T19N-R10E	1
Tulsa	Sec. 10-T19N-R10E	1
Tulsa	Sec. 12-T19N-R10E	1
Tulsa	Sec. 6-T19N-R11E	1
Tulsa	Sec. 7-T19N-R11E	1
Osage	Sec. 21-T20N-R10E	1
Osage	Sec. 24-T20N-R10E	1

Additionally, absence from our database does not preclude such species from occurring in the area.

If you have any questions about this response, please send me an email, or call us at the number given below.

Kristin Comolli
Oklahoma Natural Heritage Inventory
(405) 325-4700
kcomolli@ou.edu