



**US Army Corps
of Engineers** ®
Kansas City District

**U.S. Army Corps of Engineers - Kansas City District;
Unified Government of Wyandotte County
and Kansas City, Kansas;
and the City of Kansas City, Missouri**

TURKEY CREEK BASIN



NATURAL REACH

**Supplemental Environmental Assessment II
&
Finding of No Significant Impact**

September 2023

FINDING OF NO SIGNIFICANT IMPACT

Turkey Creek Flood Damage Reduction Project – Natural Reach Wyandotte County, Kansas

The U.S. Army Corps of Engineers, Kansas City District (Corps) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1968, as amended for a supplemental action for the Turkey Creek Flood Damage Reduction Project (Project). The draft Supplemental Environmental Assessment (SEA), dated September 2023, evaluated alternatives to address stream instability issues in the Natural Reach of Turkey Creek that are degrading the Project's performance.

The draft SEA, incorporated herein by reference, evaluated various alternatives that would address bed degradation, channel widening, and streambank erosion in the Natural Reach that are causing sediment to accumulate downstream. The Recommended Plan includes:

- Installation of 330 linear feet of riprap revetment along the left bank of Turkey Creek.
- Removal of approximately 2205 cubic yards of sediment and gravel from the channel.
- Removal of an abutment from a now defunct pedestrian bridge.
- Installation of 470 linear feet of longitudinal stone toe protection along the left bank of Turkey Creek.
- Installation of 180 linear feet of riprap revetment along the right bank of Turkey Creek.
- Installation of a 30-foot-long riprap grade control structure in the channel.

In addition to a “no action” plan, four additional action alternatives were evaluated. These alternatives included three plans using some of the measures proposed in the Recommended Plan and one alternative that expanded upon the Recommended Plan by adding longitudinal stone toe protection on the right bank in addition to the other measures.

For each alternative, the potential effects were evaluated. A summary assessment of the potential effects of the recommended plan are listed in Table 1:

Table 1: Summary of Potential Effects of the Recommended Plan

	Insignificant effects	Insignificant effects as a result of mitigation	Resource unaffected by action
Aesthetics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aquatic resources/wetlands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Invasive species	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	Insignificant effects	Insignificant effects as a result of mitigation	Resource unaffected by action
Fish and wildlife habitat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Threatened/Endangered species/critical habitat	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historic properties	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other cultural resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Floodplains	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hazardous, toxic & radioactive waste	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Hydrology	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Land use	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Navigation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Noise levels	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Public infrastructure	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Socio-economics	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental justice	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soils	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tribal trust resources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Water quality	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Climate change	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the Recommended Plan. Best management practices (BMPs) as detailed in the SEA will be implemented, if appropriate, to minimize impacts.

No compensatory mitigation is required as part of the Recommended Plan.

Public review of the draft SEA and FONSI was completed on [PENDING]. All comments submitted during the public review period were responded to in the Final SEA and FONSI.

Pursuant to Section 7 of the Endangered Species Act of 1973, as amended, the Corps determined the Recommended Plan may affect, but is not likely to adversely affect, the following federally listed species or their designated critical habitat: northern long-eared bat (*Myotis septentrionalis*). The US Fish and Wildlife Service (USFWS) concurred with the Corps' determination on 30 March 2023.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the Corps determined that historic properties would not be adversely affected by the Recommended Plan. The Kansas State Historic Preservation Office concurred with the determination on 24 February 2022.

Pursuant to the Clean Water Act of 1972, as amended, the discharge of dredged or fill material associated with the recommended plan has been found to be compliant with section 404(b)(1) Guidelines (40 CFR 230). The Clean Water Act Section 404(b)(1) Guidelines evaluation is found in Appendix A of the SEA.

A water quality certification pursuant to Section 401 of the Clean Water Act was obtained from the Kansas Department of Health and Environment on [PENDING]. All conditions of the water quality certification shall be implemented & directed by KDHE in compliance with Section 401 of the Clean Water Act.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed.

All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State, and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the recommended plan would not cause significant adverse effects on the quality of the human environment. Therefore, preparation of an Environmental Impact Statement is not required.

Date: _____

Travis J. Rayfield
Colonel, Corps of Engineers
District Commander

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1.0 INTRODUCTION

Turkey Creek is a flashy, urban stream with a drainage area of approximately 23 square miles in metropolitan areas of Kansas City, Kansas. This creek has a long history of flooding with significant flood events dating back to the turn of the 20th century. Turkey Creek originally flowed into the Missouri River, but a major flood in the 1800s moved its mouth to the Kansas River. Much of its original floodplain was developed for urban uses, including industrial, commercial, and residential areas. As a result of flood related damages, the Turkey Creek Flood Damage Reduction Project (Project) was authorized in August 1999 by the Water Resources Development Act (WRDA) of 1999 to conduct a feasibility study. Construction of measures proposed by this feasibility study was conducted under the authorization of the Consolidated Appropriations Resolution, 2003. The Project's non-Federal sponsors are Unified Government of Wyandotte County and Kansas City, Kansas (UG); and the City of Kansas City, Missouri.

The Project consists of multiple flood damage reduction measures that have been combined and implemented on the lower reach of Turkey Creek in Kansas City, Kansas (lower Turkey Creek). These measures include the construction of levees, channel widening, channel deepening, and bridge modifications. The Project was constructed in phases beginning from approximately 900 feet (ft) upstream of the 4.4 Railroad Bridge to the downstream end at the Turkey Creek Tunnel. Construction to complete the Project has occurred in phases resulting in a number of National Environmental Policy Act documents, which include:

- Turkey Creek Basin Feasibility Report and Environmental Assessment (EA), 1998.
- Final Revised Environmental Assessment for the Flood Damage Reduction General Reevaluation Report Turkey Creek Basin Kansas City, Kansas and Missouri, 2003 (GRR).
- Turkey Creek Basin Supplemental Environmental Assessment I to Final Revised Environmental Assessment for the Flood Damage Reduction General Reevaluation Report Turkey Creek Basin Kansas City, Kansas and Missouri, 2015 (SEA I).

Degradation within the Natural Reach of lower Turkey Creek (Figure 1) appears to be a result of changed hydraulic conditions following the completion of other Project design phases. This has led to instability within the Natural Reach which is now threatening adjacent infrastructure. A conceptual plan to stabilize this reach was developed in a draft 2018 Sedimentation Study. The draft 2018 Sediment Study conducted by the US Army Corps of Engineers (Corps) assesses the general conditions of the stream upstream and downstream of the Natural Reach and makes recommendations based on existing and projected conditions. Although the Natural Reach was not originally selected for improvement due to environmental concerns, bank stabilization is consistent with recommendations in the 2003 General Reevaluation Report (GRR) to apply bio-stabilization methods to address changed hydraulic conditions. Specifically, Appendix B of the GRR stated “some reaches that are proposed to be unchanged need

to be protected from new hydraulic conditions that will be present upon project completion...[P]rotection of these areas is addressed within the proposed bioengineering recommendations.” Further, the GRR incorporated the Turkey Creek Bioengineering Options Evaluation Report (BOER) which stated applicable to the Natural Reach (therein referred as “Reach 3”) recommendations that meet the Project objectives of stabilization & proper flow alignment.

1.1 Project Location

Turkey Creek is a right bank tributary of the lower Kansas River. The Turkey Creek basin has headwaters in southern Johnson County, Kansas, and drains approximately 15,000 acres before passing through a quarter-mile long tunnel to the Kansas River. Turkey Creek is approximately 15 miles long and runs parallel to Interstate 35 (I-35) for nearly its entire length. The Natural Reach, the focus of the proposed action, runs between Mill Street and Mission Road in Kansas City, Kansas (Figure 1). The Natural Reach is immediately upstream of the lower Walled Channel reach, and immediately downstream of the Restored Channel reach.



Figure 1. Project Location

1.2 Purpose and Need for Action

The purpose of the proposed action (hereinafter referred to as the “Supplemental Project”) is to address stream instability issues within the Natural Reach of lower Turkey Creek. The Natural Reach is experiencing substantial bed lowering, bank erosion, and widening immediately upstream of the entrance to the Walled Channel. Sources of sedimentation upstream, combined with the Natural Reach, have resulted in accumulation of sediment within the Walled Channel Reach directly downstream. This is causing maintenance and conveyance issues as well as degrading the flood risk management performance of the Project design. Long-term operation, maintenance implications, and adverse effects on the Project performance need to be addressed prior to project turnover to the non-federal sponsors.

1.3 Public Availability and Agency Coordination

Prior to a decision on whether to prepare an environmental impact statement, the Corps will circulate a Public Notice that announces the availability of the Draft Supplemental EA (SEA), Finding of No Significant Impact (FONSI), and Section 404(b)(1) (Appendix A). The Public Notice will be made available for a 30-day comment period to the public and resource agencies. At the conclusion of the comment period any public or resource agency comments received, as well as applicable Corps responses to those comments, will be included with the final NEPA document (See Section 4 and Appendix G).

2.0 RECOMMENDED PLAN AND ALTERNATIVES

This SEA only addresses changes to the Project within the Natural Reach segment (Figure 1). No changes are proposed to the Project within the upstream Restored Channel or downstream Walled Channel segments of lower Turkey Creek. Proposed Supplemental Project designs considered multiple erosion, streambed, and stream-width control structures and methods.

2.1 Alternatives Carried Forward for Analysis

2.1.1 No Action Alternative

Under the No Action Alternative (NAA) there would be no actions taken to improve bed lowering, bank erosion, and widening issues within the Natural Reach of lower Turkey Creek. This alternative is the basis of comparison for any plan of improvement and requires acceptance of the existing flooding and stream degradation concerns. It is probable that this alternative would indirectly result in a future stabilization action(s) by another agency, particularly to protect adjacent I-35 infrastructure from erosion. While the exact nature and scale of these potential future actions cannot be known, they would likely be comparable to the action alternatives described below.

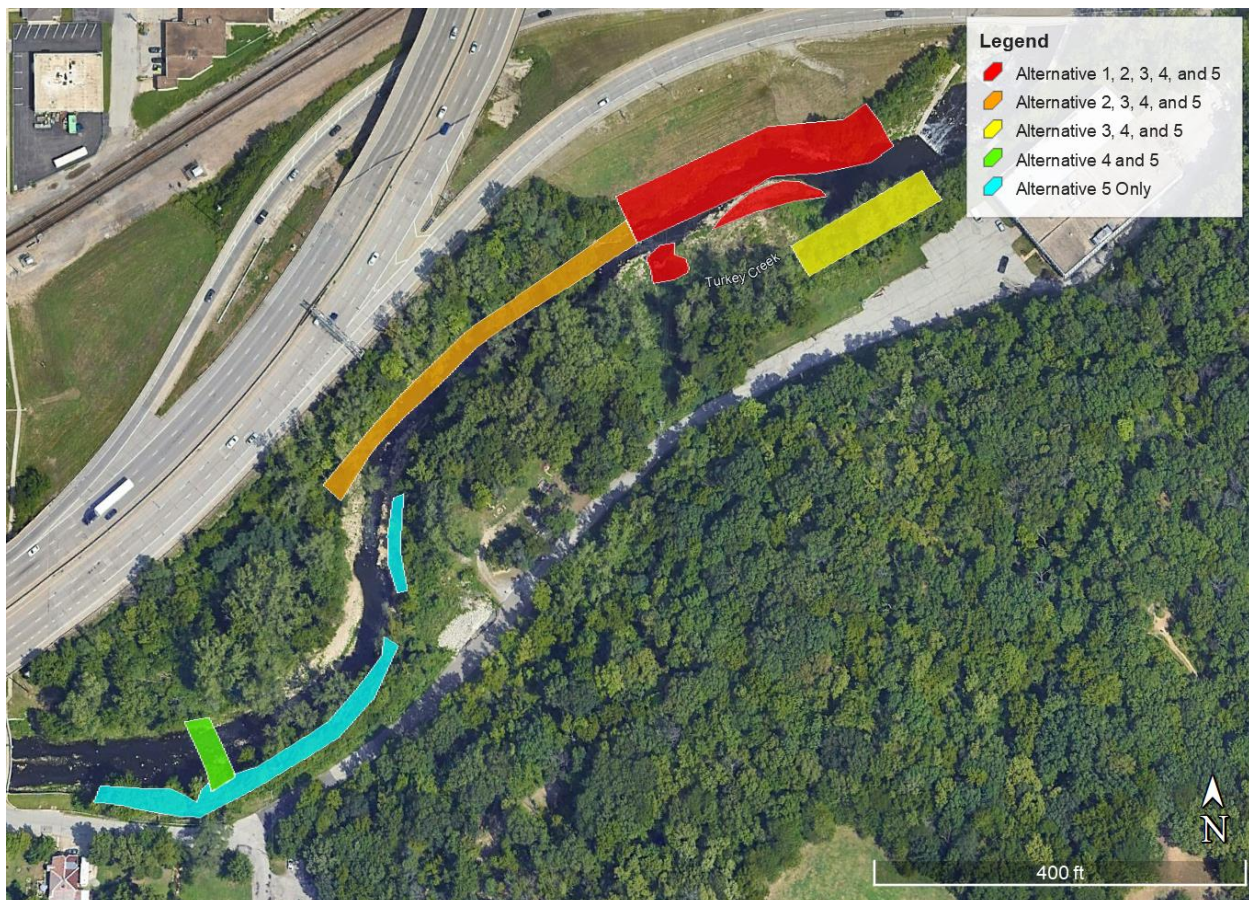


Figure 2. Action Alternative Map

2.1.2 Action Alternative 1 – Left Bank Revetment, Gravel Removal, and Bridge Abutment Removal

Action Alternative 1 would consist of three measures. First, a 330-foot-long riprap revetment would be installed on the left descending bank shortly upstream of the Walled Channel reach. This area is experiencing the most erosion in the Natural Reach and is crucial for supporting the I-35 Southwest Boulevard offramp. The streambank would be sloped at 3H:1V and the riprap revetment would be placed up to an elevation 789 feet, which is the approximate top of bank. The revetment would have a thickness of seven feet at the base to provide extra stone for launching, and a 3.5-foot thickness the rest of the way up the slope. The additional stone at the base will make the feature more resilient to toe scour, which is one of the most common methods of riprap failure. A 7-foot-thick revetment key would be placed at the upstream end of the revetment. The riprap would be sized to withstand a 1% Annual Exceedance Probability (AEP) discharge, which is approximately 24,300 cubic feet per second (cfs). The revetment would be embedded 0.5 feet into the channel to prevent the stone from sliding on the channel bed. This measure would install approximately 4,701.2 cubic yards of stone.

Second, this alternative would remove approximately 2,205 cubic yards of sediment and gravel from the gravel bar adjacent to the riprap revetment to create a smoother transition into the Walled Channel. Third, an abutment from a previously removed pedestrian bridge would also be removed to eliminate it as an obstruction in the channel. The Corps anticipates that all removed material will be disposed of in a landfill. Regardless, the material will be disposed of outside of the channel and 100-year floodplain.

Because this alternative would not address all erosion and stability issues in the Natural Reach, it is possible that another agency would eventually conduct their own stabilization action(s) as an indirect consequence of this alternative, most likely to preserve adjacent I-35 infrastructure and/or Seminary Street.

2.1.3 Action Alternative 2 – Action Alternative 1 with Left Bank Longitudinal Stone Toe Protection

Action Alternative 2 would utilize all measures included in Action Alternative 1 but would add a 470-foot-long longitudinal stone toe along the left descending bank upstream of the riprap revetment (see Figure 2), providing I-35 with additional protection from erosion. The stone toe would have a riverward side slope of 2H:1V and would be embedded into the channel by 0.5 feet to prevent stone from sliding on the channel bed. Because boring logs and field reconnaissance indicate that the channel bed in this reach consists mostly of bedrock, a thickness of 3.5 feet is proposed for the stone toe. This thickness would be sufficient to resist toe scour without requiring excavation into the I-35 embankment or extending the stone toe too far into the channel, which would raise water surface elevation and stream velocity unnecessarily.

Keys would be placed approximately every 75 feet along the stone toe and would have a total height of 15 feet from the bottom of the stone toe to the top of the key. Keys would be placed perpendicularly to the stone toe except for the end keys, which would be angled at 110-degrees. The middle keys would have a 3.5-foot thickness, 6-foot width, and would be placed on the existing grade. The end keys would be embedded into the streambank and have a 6-foot thickness. Approximately 2,152.6 cubic yards of stone would be used to construct the stone toe and keys.

Because this alternative would not address erosion and stability issues on the Natural Reach's right bank, it is possible that another agency would eventually conduct their own stabilization action(s) as an indirect consequence of this alternative, most likely to preserve Seminary Street.

2.1.4 Action Alternative 3 – Action Alternative 2 with Right Bank Revetment

Action Alternative 3 would utilize all measures included in Action Alternative 2 but would add a 180-foot-long riprap revetment along the right descending bank shortly upstream of the Walled Channel reach to address erosion concerns on the right bank of Turkey Creek. Because modeled velocities on this side of the bank is much lower than on the left, the riprap revetment here would have a slightly lower top elevation (786 feet) and a steeper slope of 2H:1V when compared to the left bank revetment. The right bank revetment would utilize a revetment key like the left bank revetment, use the same size of riprap, and install riprap at the same thicknesses. This right bank stabilization measure would utilize approximately 2,207.8 cubic yards of stone.

Because this alternative would not address all erosion and stability issues on the Natural Reach's right bank, it is possible that another agency would eventually conduct their own stabilization action(s) as an indirect consequence of this alternative, most likely to preserve Seminary Street.

2.1.5 Action Alternative 4 – Action Alternative 3 with Grade Control Structure (Recommended Plan)

Action Alternative 4 would utilize all measures included in Action Alternative 3 but would add a riprap grade control structure upstream of the other proposed features to address bed degradation in the channel (see Figure 2). This grade control structure would extend across the full width of the channel and have a 30-foot width parallel to the flow. The grade control structure would be five feet thick and constructed with riprap of the same size used in the riprap revetments. Approximately 430.6 cubic yards of stone would be used to construct this grade control structure.

This structure would be installed upstream of a currently existing headcut in the stream, which is anticipated to continue migrating upstream where it would eventually affect Project infrastructure & efficacy. The grade control structure would intercept the headcut and prevent it from moving further upstream. In order to minimize the potential for additional bank erosion due to a scour hole forming downstream of the grade control

structure, the structure would have an invert approximately level with the existing bed and will launch once the headcut reaches the structure. Figure 3 demonstrates how this would function.

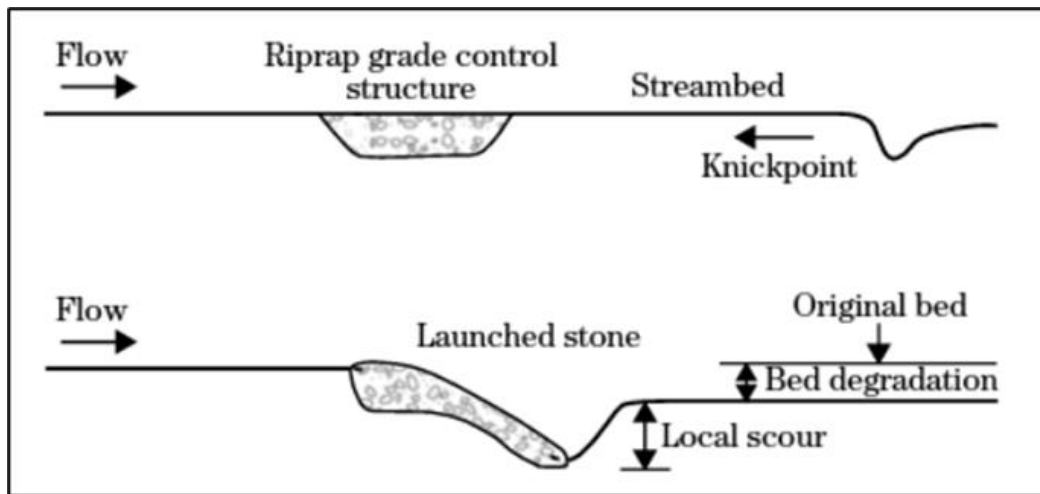


Figure 3. Riprap grade control structure (NRCS, 2007)

Because this alternative would not address all erosion and stability issues on the Natural Reach's right bank, it is possible that another agency would eventually conduct their own stabilization action(s) as an indirect consequence of this alternative, most likely to preserve Seminary Street.

Action Alternative 4 is the Recommended Plan because it does the most to address the various erosion and infrastructure issues in the Natural Reach as contemplated in the GRR while remaining within the Project's cost restraints.

2.1.6 Action Alternative 5 – Action Alternative 4 with Right Bank Longitudinal Stone Toe Protection

Action Alternative 5 would utilize all measures included in Action Alternative 4 but would add 540 linear feet of longitudinal stone toe protection on the right descending bank to protect road infrastructure from streambank erosion (see Figure 2). The stone toes would be constructed in the same manner as the left bank stone toe. Approximately 2,825.6 cubic yards of stone would be utilized to construct these stone toes. Because this alternative would address erosion and stability concerns across both banks, this alternative is not expected to indirectly result in future stabilization actions in the Natural Reach. The Corps did not select Action Alternative 5 as the Recommended Plan due to its excessive cost.

2.2 Alternatives Eliminated from Further Consideration

2.2.1 Floodplain Benching / Channel Widening

The purpose of these alternatives would be to create a greater cross-sectional area to reduce velocities which would allow for a smaller sized riprap. However, there are several disadvantages with this approach. First, space is generally scarce through the Natural Reach, with very high banks on each side. A floodplain bench could be constructable on the right bank but would require a significant amount of excavation. Additionally, any excavation in this area could aggravate existing slides and instability or initiate new instances of the same. The Corps' initial modeling of floodplain benching strongly indicated that velocities and shear stress would be very high on the bench, known causes of severe erosion.

Widening the channel could decrease velocities enough to use a smaller riprap size. However, increasing the area of the main channel may also lead to increased sediment deposition, which would require periodic maintenance to maintain the desired cross-section area. Additionally, channel widening or floodplain benching may increase the water surface slope and velocities upstream of the Natural Reach, which could lead to channel incision and bank erosion. For these reasons, these alternatives would likely fail to meet the purpose and need of the Supplemental Project in the long-term.

2.2.2 Grouted Riprap

Grouted riprap consists of riprap bonded by a cementitious material referred to as grout. Grouted riprap is usually installed when a desired size of riprap is greater than what can be manufactured by local quarries. Grouted riprap forms a rigid blanket over a bank slope or surface and shields the underlying and/or supportive material from exposure to flow velocities as long as the cemented grout and riprap matrix remains intact and the underlying material is not displaced, which would expose the rigid grouted riprap blanket to cantilevered loading.

Grouted riprap was eliminated from further consideration due to the anticipated adjustment of channel bank slopes prior to completion of the Project and throughout the Project's lifetime. A reliable supporting bank slope and channel bed is preferred to provide a consistent support for the grout and riprap matrix to ensure the integrity of the grouted riprap blanket. Relatively consistent temperatures and a consistently wet or dry environment are ideal for grouted riprap installations. Due to the rapidly varying nature of flows on Turkey Creek, as well as the variable temperatures, there is a high likelihood of breakdown of the grout matrix between the constituent riprap, which is anticipated to result in the displacement of the grouted riprap. To maintain a grouted riprap installation, it is anticipated that more frequent and involved monitoring and maintenance of the feature would be required as compared to a riprap-only alternative. Thus, this alternative would likely fail to meet the purpose and need of the Supplemental Project in the long-term.

2.2.3 Gabions

Gabions consist of manually constructed wire cages around installed volumes of riprap. The individual baskets are closed around the internal riprap. Individual gabion baskets generally take the form of rectangular prisms, or brick-like shape, and are frequently installed with multiple individual gabion baskets being interconnected both horizontally along a single level, as well as vertically in height. These interconnected and overlapping gabion installations provide a permeable barrier between streamflow and the bank slope or surface to be shielded. Due to the use of smaller constituent riprap within the wire baskets, minor conformance of the individual baskets and failure can occur due to displacement of soils and supporting materials. Gabions can be vulnerable to debris damage, oxidation of the wiring material and/or ultraviolet exposure and degradation of protective wire wrapping, and/or displacement of supporting material.

Gabions were eliminated from further consideration due to the vulnerability of wiring damage from oxidation, debris damage, and the potential for feature compromise due to scour or bank erosion. Turkey Creek is a flashy stream within a highly urbanized environment. Flow events can repeatedly wet the metal cages, contributing to oxidation and damage to the cages, and the urban environment can present a damaging debris load from both natural and manufactured materials. While the gabion installations can withstand relatively minor erosion or adjustment of the bank slope or foundation, the flashy nature of Turkey Creek may result in displacement of material sufficient to compromise the integrity of a gabion feature. Thus, this alternative would likely fail to meet the purpose and need of the Supplemental Project in the long-term.

2.2.4 Articulated Concrete Blocks

Articulated Concrete Blocks (ACBs) are a relatively common bank stabilization technique that can withstand high velocities. Many types of ACB systems are available from a variety of manufacturers. ACBs are typically interconnected by cabling or are interlocked. However, the interconnecting features for ACBs can be vulnerable to degradation due to ultraviolet exposure and repeated wetting and drying as discussed with gabion features. Further, ACB use in the Natural Reach would be impractical because of the steepness of the left bank along I-35, which is steeper than 2H:1V. This alternative would likely fail to meet the purpose and need of the Supplemental Project in the long term.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The National Environmental Policy Act and the Council on Environmental Quality's NEPA Implementing Regulations require that an EA identify the likely environmental effects of a proposed project and that the agency determine whether those impacts may be significant. Effects (or impacts) are changes to the human environment from the proposed action or alternatives that are reasonably foreseeable and include direct effects, indirect effects, and/or cumulative effects, as defined by 40 C.F.R. § 1508.1(g).

Effects may include ecological, aesthetic, historic, cultural, economic, social, or health effects, and can be either beneficial or adverse.

In considering whether the effects of the proposed action are significant, agencies shall analyze the potentially affected environment and degree of the effects of the action. (40 C.F.R. § 1501.3(b)). In considering the potentially affected environment, agencies should consider the affected area and its resources, understanding that significance varies with the setting of the proposed action. Agencies should consider connected actions including actions that automatically trigger other actions, that cannot or will not proceed unless other actions are taken previously or simultaneously, or are independent parts of a larger action and depend on the larger action for their justification. (40 C.F.R. § 1501.9(e)). In considering the degree of the effects of the action, agencies should consider both short-term and long-term effects, both beneficial and adverse effects, effects on public health and safety, and effects that would violate laws protecting the environment. The term “degree” is not defined in the governing regulations, but generally refers to the magnitude of change that would result from the alternatives evaluated herein.

All potentially relevant resource areas were initially considered for analysis in this SEA. Some resource topics are not discussed, or the discussion is limited in scope, due to the lack of anticipated effect from the alternatives on the resource or because that resource is not located within the affected environment. Further, the Project area was assessed as a whole during the 2003 GRR. Resource topics considered but eliminated from further analysis are provided in Table 1.

Table 1. Environmental Resources Considered but Eliminated

Resources	Rational
Aesthetics and Recreation	The area of potential effect is not visible from roadways, residences, or offices due to natural vegetation and urban setting; recreational opportunity is restricted due to right of ways and accessibility.
Land Use	Land uses have not substantially changed since the Project was approved in 2003. Proposed action would not affect land use.
Prime Farmland	No convertible prime farmland is in or adjacent to the project area (NRCS 2022).
Wetlands	The area of potential effect was reviewed using the U.S. Fish and Wildlife online wetland mapper. No wetlands are in or directly adjacent to the action area (USFWS 2022). A field survey conducted 1 November 2022 confirms no wetlands are present.
Wild and Scenic Rivers	Turkey Creek is not designated as a wild or scenic river.

This section presents the adverse and beneficial environmental effects of the action alternatives and the No Action Alternative. The section is organized by resource topic,

with the effects of alternatives discussed under each resource topic. Impacts are quantified whenever possible. Qualitative descriptions of impacts are explained by accompanying text where used.

Qualitative definitions/descriptions of impacts as used in this section of the SEA include:

Degree:

- No Effect, or Negligible – a resource would not be affected, or the effects would be at or below the level of detection, and changes would not be of any measurable or perceptible consequence.
- Minor – effects on a resource would be detectable, although the effects would be localized, small, and of little consequence to the sustainability of the resource. Mitigation measures, if needed to offset adverse effects, would be simple and achievable.
- Moderate – effects on a resource would be readily detectable, localized, and measurable. Mitigation measures, if needed to offset adverse effects, would be extensive and likely achievable.
- Significant – effects on a resource would be obvious and would have substantial consequences. The resource would be severely impaired so that it is no longer functional in the project area. Mitigation measures to offset the adverse effects would be extensive, and success of the mitigation measures would not be guaranteed.
- Beneficial – A measurable and positive effect to a resource. There would be improved conditions, sustainability, or viability of the resource.

Duration:

- Short-term – temporary effects caused by the construction and/or implementation of a selected alternative.
- Long-term – effects caused by an alternative that remain after the action has been completed and/or after it is in full and complete operation.

3.1 Climate

3.1.1 Existing Conditions

Kansas, which lies in the central Great Plains, straddles the transition from relatively abundant precipitation in the southeast to the semiarid conditions in the west (Frankson et al., 2022). The lack of mountains to the north and south expose Kansas to cold, dry air from the north and warm, moist air from the Gulf of Mexico. Due to the interaction of these two air masses, severe thunderstorms are common in Kansas. The mean annual temperature around the Natural Reach is about 57 degrees Fahrenheit. The monthly means vary from 32.1 degrees Fahrenheit in January to 81.2 degrees Fahrenheit in July. Precipitation in the Natural Reach is generally greatest in spring and early summer. The average annual precipitation is about 36 inches. Figure 4 depicts monthly averages for temperature and precipitation using data from the closest National Oceanic and Atmospheric Administration (NOAA) weather station (Station USW00013988) in

Kansas City, Missouri (NOAA, 2023), which is approximately 4.8 miles northeast of the Natural Reach.

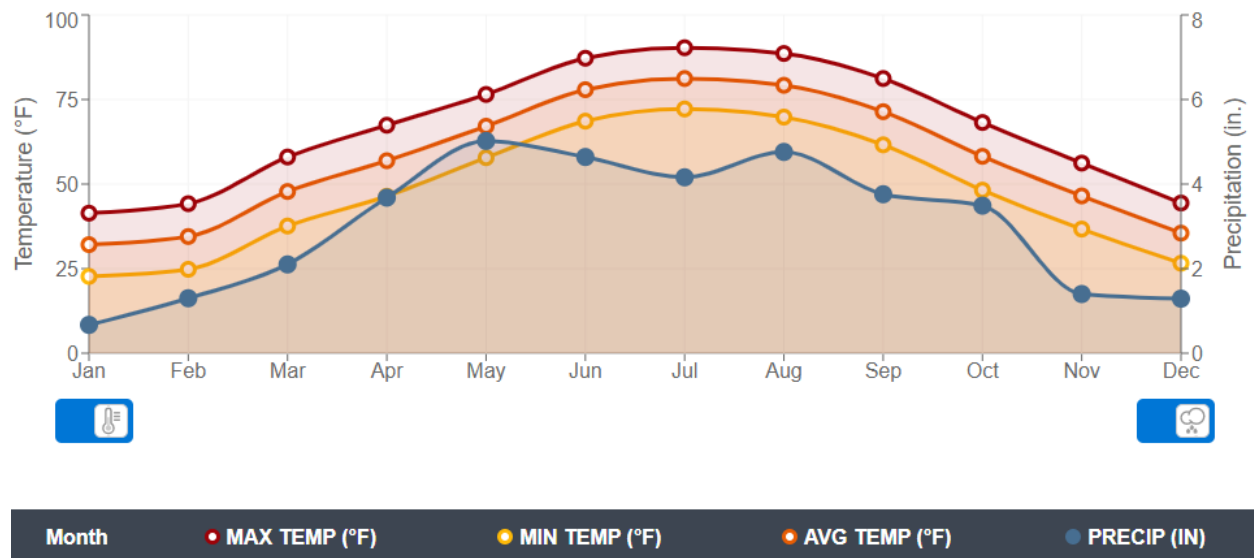


Figure 4. Monthly temperature and precipitation averages for Kansas City Downtown Airport, Missouri from 2006 to 2020.

Figure 5 depicts the observed and projected changes in near-surface air temperatures for Kansas; one projection assumes greenhouse gas emissions will continue to rise (“Higher Emissions”) and another projection assumes greenhouse gas emissions will increase at a slower rate (“Lower Emissions”; Frankson et al., 2022). Both projections indicate Kansas will experience higher than average temperatures as the 21st Century progresses, although the increase is expected to be greater with higher greenhouse gas emissions.

Observed and Projected Temperature Change

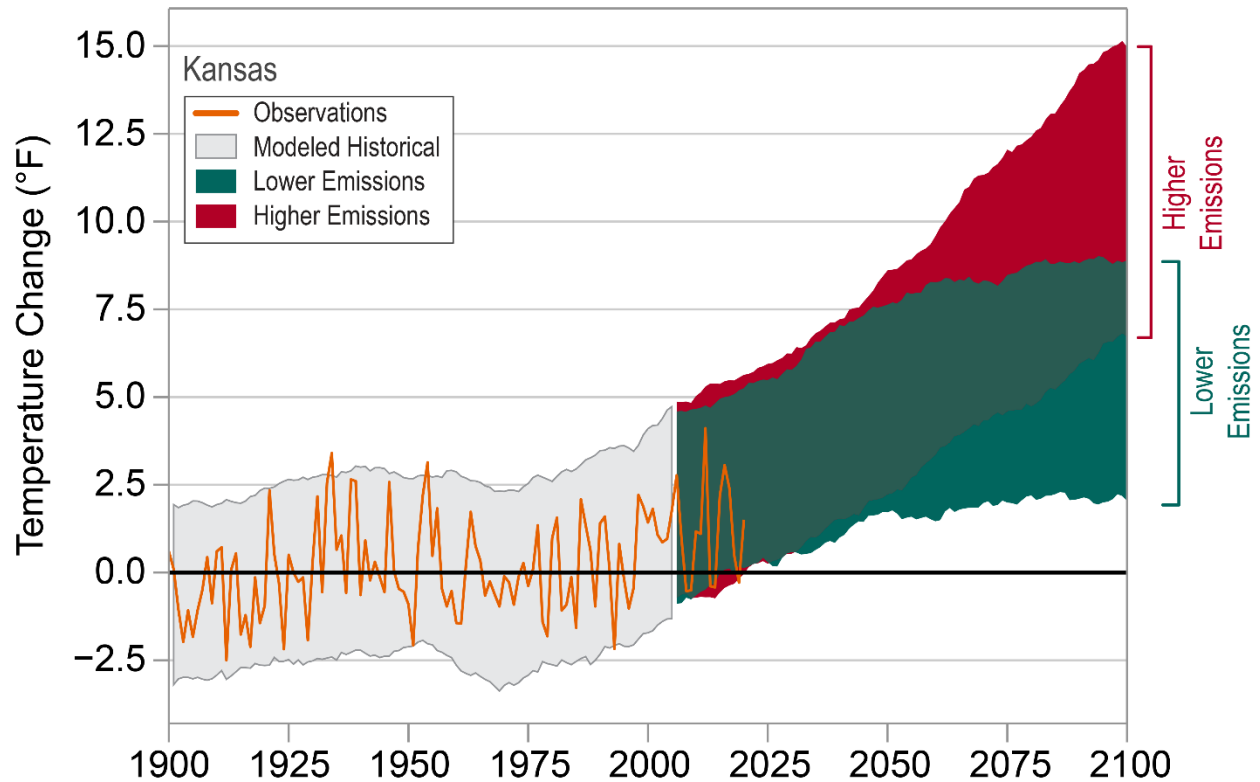


Figure 5. Observed and projected temperatures of Kansas. Figure adapted from Frankson et al., 2022.

Summer precipitation is expected to decrease across the state of Kansas, while winter precipitation is projected to increase (Frankson et al., 2022). This trend, if realized, is likely to result in more intense droughts in the future. Higher summer temperatures will increase the rate of soil moisture loss during dry periods, leading to exacerbated drought conditions. There has also been a general increase in the frequency of extreme precipitation events, particularly in the eastern part of the state (Frankson et al., 2022). Thus, the frequency of flooding events may also increase in the future.

The USACE Climate Hydrology Assessment Tool was used to observe projected trends in streamflow within the Lower Kansas watershed (HUC 10270104). These projections (see Figure 6 below) indicate there are no statistically significant trends in streamflow in the lower Kansas River watershed from 1951 to 2005. However, a statistically significant trend of increased streamflow is projected from 2006 to 2099 under one set of projected future conditions (Representative Concentration Pathway [RCP] 8.5). Thus, flood events, may become more frequent and more intense as the century progresses.

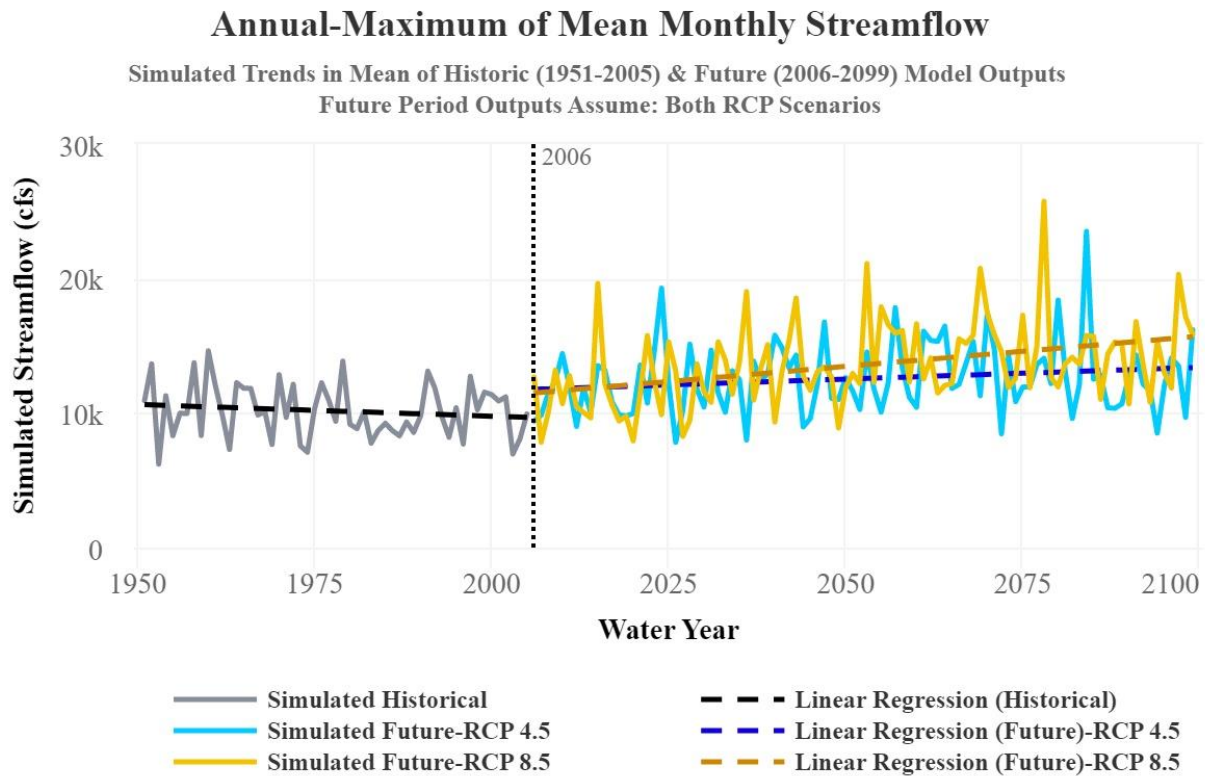


Figure 6. Annual-Maximum of Mean Monthly Streamflow.

Figure 6 displays projected trends for annual-maximum of mean monthly streamflow in the lower Kansas River watershed (HUC 10270104). Note that these future projections use two different sets of possible conditions: RCP 4.5, which assumes greenhouse gas emissions will stabilize by the end of the century, and RCP 8.5, which assumes that greenhouse gas emissions will continue to increase throughout the century. The trendline equation for Simulated Historical: $Q = 10,625.86 - 17.479 \cdot (\text{Water Year})$, with p-values 0.305 (t-Test), 0.309 (Mann-Kendall), and 0.337 (Spearman Rank-Order). The trendline equation for Simulated Future-RCP 4.5: $Q = 11,764.31 + 17.409 \cdot (\text{Water Year})$, with p-values 0.0817 (t-Test), 0.0789 (Mann-Kendall), and 0.0892 (Spearman Rank-Order). The trendline equation for Simulated Future-RCP 8.5: $Q = 11,493.75 + 44.961 \cdot (\text{Water Year})$, with p-values $9.2 \cdot 10^{-5}$ (t-Test), $8.18 \cdot 10^{-5}$ (Mann-Kendall), and $2.62 \cdot 10^{-5}$ (Spearman Rank-Order). P-values lower than 0.5 indicate a statistically significant trend, and therefore only the projected future under RCP 8.5 predicts a statistically significant increase in streamflow. Projected future under RCP 4.5 shows a slight upward trend, however, it is not statistically significant.

3.1.2 Environmental Consequences

No Action Alternative: Under the NAA, no construction activities would occur, thus there would be no increase in greenhouse gas emissions and no effect on climate in the short-term. However, the NAA is likely to indirectly cause other agencies to engage in

stabilization actions in the Natural Reach in order to preserve crucial infrastructure such as I-35. The NAA could therefore indirectly cause some level of greenhouse gas emissions. The Corps has no reason to believe these emissions would exceed the figures represented in Table 2 and would therefore have negligible effects on climate.

Action Alternative 1: Under this alternative, construction activities would be undertaken to stabilize parts of the Natural Reach. These activities would require the use of equipment that emit greenhouse gases. In order to estimate the amount of greenhouse gases that would be emitted under the action alternatives, a list of the necessary equipment and the amount of fuel each piece of equipment would require was generated for all action alternatives (see Appendix D). The Environmental Protection Agency’s (EPA) Greenhouse Gas Equivalencies Calculator website (USEPA, 2023b) was used to estimate the amount of greenhouse gases (reported in weight of carbon dioxide equivalent) that would be generated by using the fuel necessary for each alternative. Because some types of equipment require gasoline and others diesel, a conversion ratio of 1 gallon of gasoline to 0.873 gallons of diesel was used to generate a “gallons of gasoline equivalent” value for each piece of equipment. This conversion ratio was taken from the Greenhouse Gas Equivalences Generator (USEPA, 2023b). Table 2 summarizes the results of this exercise.

Table 2. Approximate direct greenhouse gas emissions by each alternative

Alternative	Carbon Dioxide Equivalent Directly Emitted (in tons)
No Action Alternative	0
Action Alternative 1	88.7
Action Alternative 2	135.7
Action Alternative 3	229.6
Action Alternative 4	240.5
Action Alternative 5	286.3

Action Alternative 1 is therefore anticipated to directly result in the emission of roughly 88.7 tons of carbon dioxide equivalent. As noted prior, this alternative may indirectly result in other stabilization actions that would be undertaken in the Natural Reach to address erosion issues left unresolved by this alternative. If these future actions were to be undertaken, it is probable that the greenhouse gases emitted would be similar to the values reported in Table 2. The overall small scale of these actions mean that even if these potential indirect emissions were realized, the combined direct and indirect effect on climate would be negligible.

Action Alternative 2: This alternative would directly result in the emission of approximately 135.7 tons of carbon dioxide equivalent. Because this alternative would not address all erosion concerns in the Natural Reach (specifically on the right bank and

channel bed), this alternative may indirectly cause future stabilization actions with their own associated emissions. As with the indirect emissions under Action Alternative 1, it is probable that these indirect emissions would be similar to the values reported in Table 2. Once again, the overall small scale of these actions means that the combined direct and indirect effect on climate would be negligible.

Action Alternative 3: This alternative would directly result in the emission of approximately 229.6 tons of carbon dioxide equivalent. Because this alternative would not address all erosion concerns in the Natural Reach (specifically on the upstream right bank and channel bed), this alternative may indirectly cause future stabilization actions with their own associated emissions. As with the previously discussed action alternatives, these emissions would likely be similar to the values reported in Table 2, and the combined direct and indirect effect on climate would be negligible.

Action Alternative 4 (Recommended Plan): This alternative would directly result in the emission of approximately 240.5 tons of carbon dioxide equivalent. Because this alternative would not address all erosion concerns on the right bank, this alternative may indirectly cause future stabilization actions with their own associated emissions. As with the previously discussed action alternatives, these emissions would likely be similar to the values reported in Table 2, and the combined direct and indirect effect on climate would be negligible.

Action Alternative 5: This alternative would directly result in the emission of approximately 286.3 tons of carbon dioxide equivalent, the most out of any of the considered alternatives. Because this alternative would do the most to address erosion concerns in the Natural Reach, it is unlikely that additional stabilization actions would be undertaken here. Due to the small scale of the actions considered, this alternative's effect on climate would be negligible.

3.2 Geology and Soils

3.2.1 Existing Conditions

Turkey Creek is located in the Osage Plains region of the central lowland physiographic region. The project area is near the boundary with the Glaciated Plains region. The lower Turkey Creek valley was affected by glaciations near downtown Kansas City, but glaciers did not advance further south or upstream of the creek. Turkey Creek has eroded the rolling-to-level upland and associated drainage ways to create vertical relief greater than 180 feet in the vicinity of the Natural Reach. Bedrock is present in numerous places along the valley walls and the creek bottom.

Generally, the site is overlain by a layer of fill, covering lean clays that overlay cyclical layers of shale and Bethany or Winterset limestone. The layer of fill is a stiff, moist, and dark brown layer roughly 7-10 feet in thickness where work is to be completed. Traces of gravel and sands, broken glass, and fragments of cinder blocks or bricks are present. Directly underneath the fill is a layer of natural soils. Native soils within the Natural

Reach are mostly alluvial deposits overlying an eroded bedrock surface. The thickness of native soils ranges from less than 5 feet to greater than 14 feet. Native alluvial deposits are composed of soft-to-stiff lean clays with occasional layers of fat clay and clayey gravel overlying weathered shale and limestone, which in turn overlies dense limestone bedrock. In many places, the creek bottom is covered with a layer of relatively clean sub-angular limestone and chert gravel and cobbles.

Soil resources are gradually being lost in the Natural Reach due to erosion. This is particularly affecting the left bank, which supports the I-35 and the I-35 Southwest Boulevard offramp. Historic satellite imagery indicates that over 0.4 acres of soil between Turkey Creek and the I-35 Southwest Boulevard offramp were lost from 2012 to 2022 (Google Earth).

3.2.2 Environmental Consequences

No Action Alternative: Under the NAA, no construction activities would be undertaken and thus there would be no short-term impacts to geology or soils. However, erosion in the Natural Reach would continue unabated, resulting in the gradual loss of soil resources. The NAA would likely indirectly cause future stabilization actions in the Natural Reach, particularly to protect I-35 infrastructure. The Corps anticipates that these actions would stabilize soils in the Natural Reach and therefore limit the loss of soil in the long-term. Thus, minor long-term effects to soil would be anticipated under this alternative.

Action Alternative 1: Minor short-term effects to soils would occur due to construction activities. The implementation of Best Management Practices (BMPs) such as silt fences would minimize the loss of soils during the implementation of this alternative. Because erosion in the Natural Reach would be reduced, the long-term effect of this alternative would be beneficial. This alternative would not address all streambank erosion concerns in the Natural Reach, and therefore this alternative may indirectly cause future stabilization actions here. These activities would also be expected to result in minor construction-related impacts to soils, while the long-term effect would be beneficial.

Action Alternative 2: While construction activities under this alternative would be of a greater scale than those under Action Alternative 1, this increase would be very modest in scale and the short-term effect on soils would still be minor. Once again, the implementation of BMPs such as silt fences would minimize the loss of soils during the implementation of this alternative. The long-term effects to soils would be beneficial due to reduced erosion and would be greater than Action Alternative 1. As under Action Alternative 1, this alternative may indirectly cause future stabilization actions which would again result in minor construction-related impacts while ultimately benefiting soils in the Natural Reach.

Action Alternative 3: Construction activities under this alternative would be of a greater scale than those under Action Alternative 2, though only modestly so. BMPs would

again be implemented, and the short-term effect would be minor. Greater beneficial effects in the long-term would be expected due to a greater reduction in erosion. As with the previously considered action alternatives, future stabilization activities indirectly caused by this alternative are possible and would again result in minor construction-related impacts while ultimately benefiting soils in the Natural Reach.

Action Alternative 4 (Recommended Plan): Construction activities under this alternative would be increased very modestly under this alternative when compared to Action Alternative 3. BMPs would again be implemented, and the short-term effect would be minor. Because the only difference between this alternative and Action Alternative 3 is the addition of a grade control structure to address channel bed degradation, long-term beneficial effects to soils would be very similar between these alternatives. As with the previously considered action alternatives, future stabilization activities indirectly caused by this alternative are possible and would again result in minor construction-related impacts while ultimately benefiting soils in the Natural Reach.

Action Alternative 5: Construction activities are more extensive under this alternative than any of the others evaluated. However, given the overall small scale of the Natural Reach and the fact that excavation activities would not need to be extensive, short-term construction-related impacts to soils would still be minor. Because this alternative does the most to address erosion concerns throughout the Natural Reach, the greatest long-term benefits to soils would be realized under this alternative.

3.3 Surface Water and Other Aquatic Resources

3.3.1 Existing Conditions

Turkey Creek is a flashy, urban stream approximately 15 miles long and with a drainage area of approximately 23 square miles in metropolitan areas of Kansas City, Kansas. Turkey Creek originally flowed into the Missouri River, but a major flood in the 1800s moved its mouth to the Kansas River. Turkey Creek has been subject to a variety of modifications, including channelization, realignment, and fill activities. The modern Turkey Creek runs parallel to I-35 for nearly its entire length and passes through a quarter-mile long tunnel before its confluence with the Kansas River.

While the Project did not directly alter the Natural Reach, it did implement measures upstream and downstream that have caused instability in this part of the stream via changed hydraulic conditions. As a result, the Natural Reach is experiencing substantial bed lowering, bank erosion, and widening immediately upstream of the entrance to the Walled Channel Reach. This, in addition to sedimentation from sources further upstream, has resulted in sediment accumulation within the Walled Channel Reach, causing maintenance and conveyance issues in this part of Turkey Creek.

As with many urban creeks, water quality within Turkey Creek is affected by both point and non-point sources of pollution. A major point source is the Nelson Treatment Complex, a wastewater treatment plant operated by the Johnson County Unified

Wastewater District. This treatment plant is located upstream of the Natural Reach near the Johnson and Wyandotte County line. Discharge from this wastewater treatment plant does provide a base flow of water to Turkey Creek throughout the year. However, Turkey Creek is known to be affected by high ammonia concentrations from the wastewater treatment plant and is listed as an impaired water body under Section 303 (d) of the Clean Water Act (CWA) (KDHE 2022). Non-point sources of pollution include urban run-off such as lawn and garden chemicals, petroleum products, and industrial pollutants. Turkey Creek is not subject to any Total Maximum Daily Loads (TMDLs; KDHE, 2023)

Turkey Creek's floodplain has experienced a long history of flood events dating back to the turn of the 20th century. Many of the historic aforementioned changes to the stream have helped to manage this flood risk, and much of the stream's original floodplain has been developed for urban uses, to include industrial, commercial, and residential areas. According to flood hazard data provided by the Federal Emergency Management Agency (FEMA; see Appendix C), the floodplain along the Natural Reach is primarily located on the left descending bank and contains roadways, a railway, and to a lesser extent - commercial, industrial, and residential properties. The right descending bank is generally steeper and has little infrastructure within the flood hazard area when compared to the left descending bank aside from roadways and residential properties.

The impacts of the Project on water surface elevations (WSE) along Turkey Creek was evaluated to provide context for the Supplemental Project. Overall, the Project has substantially reduced WSE and flooding through the construction of various flood control measures. In 2015, a Conditional Letter of Map Revision (CLOMR) for the Project was submitted by HNTB Corporation on behalf of the UG (HNTB, 2015). The CLOMR documented only one location where the WSE increased due to the Project – in the Natural Reach downstream of the Mill Street Bridge. This localized increase was caused by the elimination of the overbank flow north of I-35 by the construction of the Restored Channel (HNTB, 2015). The expected maximum increase in WSE for the 0.01 AEP event was 1.23 feet. However, only one residential property located just downstream of the Mill Street bridge was impacted by the increase, and it did not affect any structures on the property. The owner was notified of the increase, and UG stated that, if necessary, it would acquire an easement for the area encroached by the 0.01 AEP flood.

Hydraulic modeling conducted for the Supplemental Project has shown that the WSE decreased substantially through the Natural Reach from 2013 to 2022, likely because of the bed degradation, bank erosion, and channel widening through this reach. However, this eroded material is transported downstream into the Walled Channel reach where some is settling out, reducing capacity, and counteracting some of the Project's flood risk management benefits in this part of the stream. This modeling has also indicated that WSE slightly rose in the Restored Channel reach immediately upstream of the Natural Reach. However, this is likely due to updated assumptions made to represent the expected channel roughness, and thus would not represent a "real world" increase

in WSE in this part of the stream. Because eroded material is settling out in the Walled Channel reach, WSE in this part of the stream is likely rising gradually over time.

3.3.2 Environmental Consequences

No Action Alternative: Under the NAA, the Corps would take no action to address streambank erosion or channel bed degradation. Sedimentation and turbidity would likely have minor impacts to water quality in the long-term. Channel bed degradation and streambank erosion would continue. This would likely interfere with the Project's performance in the long-term, particularly in the Walled Channel Reach. While WSE may continue to decrease in the Natural Reach, the transportation of eroded material into the Walled Channel reach would likely increase WSE there. The Walled Channel reach has a greater concentration of surrounding infrastructure than the Natural Reach, so minor to potentially moderate flooding impacts may occur in the long-term. Indirectly caused stabilizations actions may mitigate some of the long-term adverse effects experienced under this alternative by limiting streambank erosion and therefore sediment accumulation downstream.

Action Alternative 1: Construction activities would likely result minor short-term effects to water quality due to in-channel work and disturbed soils raising turbidity in Turkey Creek, though the overall scale of the work is small and BMPs (e.g., silt fences) would be in place. By reducing erosion, the long-term effect to water quality is beneficial. Gravel bars are a habitat feature utilized by a variety of aquatic organisms, and its removal would adversely impact the aquatic habitat. However, there are three additional factors affecting this habitat that should be considered. First, this gravel bar feature would not be entirely eliminated, only reduced to allow for a smoother transition into the Walled Channel reach. Second, the previously mentioned long-term improvements to water quality would also benefit the aquatic habitat. Third, this alternative would remove artificial material from the habitat in the form of the bridge abutment, which is also beneficial to the habitat. Thus, while minor impacts to the aquatic habitat are possible in the short-term, the net long-term impact to aquatic habitat in the Natural Reach would be beneficial.

While hydraulic modeling was not conducted for this alternative, the Corps assumes that the modeling done for the Recommended Plan is broadly representative here due to the similarity between these alternatives. This modeling indicates that WSE would increase from current conditions in the Natural Reach and Restored Channel reach due to a net increase of material in the flood hazard area. This increase would be smaller under Action Alternative 1 than under the Recommended Plan because it would place a smaller net volume of material. The modeling indicates post-implementation WSE in the Natural Reach would still be lower than WSE after implementation of other Project measures due to the amount of material that has eroded out of the Natural Reach. Thus, the long-term impact to flooding in the Natural Reach is minor. WSE in the Restored Channel reach is anticipated to increase slightly beyond WSE post-implementation of other Project measures. However, due to the previously constructed levee in the Restored Channel reach, this increase would not add any structures to the

0.01 AEP floodplain, thus keeping long-term adverse impacts here minor. By reducing the accumulation of sediment in the Walled Channel reach, this alternative would have beneficial floodplain impacts by reducing the gradual rise of WSE there.

This alternative would not address all streambank erosion concerns in the Natural Reach, and this alternative may therefore indirectly cause additional stabilization actions. These activities would also be expected to result in minor construction-related impacts, while the long-term effects to water quality and aquatic habitat would be beneficial. It is possible that these activities would raise WSE further, though the Corps anticipates that any increases would be similar to the alternatives considered in this SEA and therefore correspond to the hydraulic modeling. Thus, minor flood impacts in the Restored Channel and Natural Reach and beneficial flood effects in the Walled Channel reach would be possible.

Action Alternative 2: Impacts to water resources under this alternative would be expanded compared to Action Alternative 1, though not to a great extent. The scale of work performed would still be small and BMPs would still be implemented, so the short-term construction-related effects would be minor. Once again, water quality would benefit in the long-term. Once again, minor impacts to aquatic habitat would occur in the short-term and beneficial effects would occur in the long-term. While the net increase in material placed in the flood hazard area would be greater under this alternative than Action Alternative 1, this increase would be modest and so the long-term flooding impacts would be similar. Thus, there would be minor effects in the Restored Channel and Natural Reach, and beneficial effects in the Walled Channel reach.

Additional stabilization actions that may be indirectly caused by this alternative would also be expected to result in minor construction-related impacts to water resources while benefitting them in the long-term. It is possible that these activities would raise WSE further, though because this alternative would do more to address instability issues in the Natural Reach than Action Alternative 1, the potential for these indirect impacts to flooding is reduced. Once again, the Corps anticipates that any increases in WSE would be similar to the alternatives considered in this SEA and therefore correspond to the hydraulic modeling. Thus, minor flood impacts in the Restored Channel and Natural Reach and beneficial flood effects in the Walled Channel reach would be possible.

Action Alternative 3: This alternative, when compared to Action Alternative 2, would expand stabilization actions to part of the right bank. Because the increase in work performed would be very modest in scale, short-term construction-related impacts under this alternative would be very similar. Impacts to water quality would again be minor in the short-term and beneficial in the long-term, as would be impacts to aquatic habitat. While the net increase in material placed in the flood hazard area would be greater under this alternative than Action Alternative 2, this increase would be modest and so the long-term flooding impacts would be similar. Thus, there would be minor effects in the Restored Channel and Natural Reach, and beneficial effects in the Walled Channel

reach. Potential indirect effects on water resources are anticipated to be similar to Action Alternative 2.

Action Alternative 4 (Recommended Plan): This alternative would directly address channel bed degradation by installing a grade control structure. This would necessitate instream work, causing minor short-term effects to water quality and aquatic habitat during construction as riprap is placed into the channel. However, the aquatic habitat would benefit in the long-term from a reduction in bed degradation and sedimentation.

Turkey Creek is a jurisdictional water of the United States and requires a Section 404 evaluation (see Appendix A) and Section 401 State Water Quality Certification under the CWA. A CWA Section 402 National Pollutant Discharge Elimination System (NPDES) stormwater permit may be required from Kansas Department of Health and Environment (KDHE). Obtaining a NPDES permit would be the sole responsibility of the contractor. BMPs, such as equipment and petroleum storage precautions, solid waste management, water diversion, etc., would be implemented to minimize adverse effects to the stream. Construction activities would be required to follow state and federal CWA requirements and guidelines. Stream effects to Turkey Creek were assessed under the Kansas Stream Mitigation Method (KSMM) (USACE 2023). Based on the proposed measures, it was concluded that this alternative would result in 2189.71 debits and 2436 stream credits (see Appendix B). Thus, mitigation is not proposed.

The Corps conducted hydraulic modeling to determine the Recommended Plan's anticipated impact on WSE. This modeling indicates that WSE would be increased in the Natural Reach and Restored Channel reach. However, because WSE in the Natural Reach has been lowering over time due to erosion, WSE in the Natural Reach after the implementation of the Recommended Plan is anticipated to remain below WSE after the previous implementation of other Project measures. In other words, the increase in WSE is more than compensated for by the previous decrease. Thus, the flood impact in the Natural Reach is minor. WSE in the Restored Channel reach is anticipated to increase slightly beyond WSE post-implementation of other Project measures. However, due to the previously constructed levee in the Restored Channel reach, this increase would not add any structures to the 0.01 AEP floodplain. Because the Recommended Plan would reduce the accumulation of sediment in the Walled Channel Reach, this alternative would reduce the gradual rising of WSE there and would therefore have a beneficial impact in that part of the stream.

Effects from potential indirectly caused stabilization actions are expected to be broadly similar to Action Alternatives 1-3. Minor short-term effects to water quality and aquatic habitat may occur during construction, though these resources would benefit in the long-term due to reduced erosion. WSE might be slightly raised in the Restored Channel and Natural Reach, though the Restored Channel may benefit from reduced sediment accumulation.

Action Alternative 5: Construction activities under this alternative are greater than under any of the other considered alternatives. However, the scale of actions

undertaken would still be small in absolute terms and BMPs would still be implemented, so the short-term construction-related effects to water quality and aquatic habitat would be minor. Long-term impacts to water quality and aquatic habitat would be beneficial. While flooding impacts would be greater under this alternative than any of the others, this difference would again be small in absolute terms. In the long-term, the Restored Channel and Natural Reach would see minor adverse flooding effects and the Walled Channel reach would benefit.

3.4 Terrestrial Habitat

3.4.1 Existing Conditions

Terrestrial habitat of lower Turkey Creek consists of fragmented riparian forest and maintained road right of way due to the presence of industrial properties, fencing, roads, and other intensive land use practices. Urban encroachment has caused riparian areas to be very narrow, particularly upstream of Mill Stream Bridge. Tree species known within the proposed action area consist of cottonwood (*Populus deltoides*), sycamore (*Platanus occidentalis*), hackberry (*Celtis occidentalis*), red elm (*Ulmus rubra*), and green ash (*Fraxinus pennsylvanica*) among others. Understory vegetation is made up of dense patches of bush honeysuckle (*Lonicera* spp.), intermixed with roughleaf dogwood (*Cornus drummondii*) and saplings from the aforementioned tree species. Due to the dense bush honeysuckle canopy the ground cover is generally void of herbaceous plants; however, vines such as Japanese honeysuckle (*Lonicera japonica*) and poison ivy (*Toxicodendron radicans*) are present. Approximately 0.35 acres of the Natural Reach can be considered bottomland hardwood forest due to the flora species present and topography. Areas lacking trees are made up of maintained grassy right of ways or rip-rap areas associated with bank stabilization. Like most urban, inner-city streams the riparian area is littered with trash, residential waste, and rubble. Streambank erosion has resulted in the gradual reduction of terrestrial habitat in the Natural Reach, particularly on the left bank.

The University of Georgia's EDDMapS website maintains lists of invasive species records throughout the United States, including individual states and counties (University of Georgia, 2023). Wyandotte County, Kansas has records for a variety of invasive plants, including bush honeysuckle, johnsongrass (*Sorghum halepense*), garlic mustard (*Alliaria petiolata*), autumn olive (*Elaeagnus umbellata*), and purple crown-vetch (*Securigera varia*), among many others. Given the ruderal and unmanaged nature of the Natural Reach area, many of these invasive species are likely to be present.

The Kansas Department of Wildlife and Parks (KDWP) conducted a Subjective Terrestrial Wildlife Habitat Evaluation for Turkey Creek in 2002. All reaches of the project area were rated as "Fair" with scores between 4.0 and 4.5 on a scale of 0 to 10, with higher numbers indicating better habitat conditions (USACE, 2003). However, since that time the Turkey Creek basin has experienced further environmental degradation. Emerald ash borer (*Agilus planipennis*), which was first detected in Wyandotte County in 2012 (USDA, 2023), has caused a die-off of ash trees including the riparian green

ash. Other riparian trees have been lost due to cutting or advanced age, and the proliferation of invasive species such as bush honeysuckle interferes with the growth of new trees to replace those that have been lost. Thus, there has been a gradual decrease in riparian habitat quality since the 2002 habitat evaluation.

3.4.2 Environmental Consequences

No Action Alternative: Under the NAA, no construction activities would be undertaken. Thus, there would be no short-term effect to terrestrial habitat. However, the ongoing erosion affecting the Natural Reach would continue unabated. This would mean that riparian habitat would continue to be lost, particularly on the left bank. Any indirectly caused stabilization actions would likely need to clear terrestrial habitat in order for equipment to access the site. However, given the limited quality and quantity of this habitat within the Natural Reach, the combined direct and indirect effect would be minor.

Action Alternative 1: In order to make the site accessible for construction equipment, vegetation would need to be removed along 1,500 feet of the left bank. However, these activities would work around the habitat present to the greatest extent possible. Less than 0.1 acres of bottomland hardwood forest would be removed and cleared areas would be allowed to revegetate over time. Thus, the impact to bottomland hardwood forests would be minimal. Disturbed areas would be reseeded with native species to prevent the spread of invasive plants. Effects to terrestrial habitat by indirectly caused actions would be expected to be similar to the direct effects. The short-term and long-term effect to terrestrial habitats would be minor.

Action Alternative 2: Impacts to terrestrial habitat under this alternative would be similar to Action Alternative 1. Because the area where the stone toe would be installed would need to be cleared of vegetation anyway in order to create access to the left bank revetment site, the increase in vegetation clearance between this alternative and Action Alternative 1 would be negligible. As with Action Alternative 1, less than 0.1 acres of bottomland hardwood forest would be removed and cleared areas would be allowed to revegetate over time. Thus, the impact to bottomland hardwood forests would be minimal. Disturbed areas would be reseeded with native species to prevent the spread of invasive plants. Effects to terrestrial habitat by indirectly caused actions would be similar to the direct effects. The short-term and long-term effect to terrestrial habitats would be minor.

Action Alternative 3: This alternative, when compared to Action Alternative 2, would expand construction activities and vegetation clearance to the right bank. However, even with this expansion the total removal of terrestrial habitat is small in scale and habitat affected is limited in quality. As with Action Alternatives 1 and 2, less than 0.1 acres of bottomland hardwood forest would be removed and cleared areas would be allowed to revegetate over time. Thus, the impact to bottomland hardwood forests would be minimal. Disturbed areas would be reseeded with native species to prevent the spread of invasive plants. Effects to terrestrial habitat by indirectly caused actions would be similar to the direct effects. The short-term and long-term effect to terrestrial

habitats would be minor.

Action Alternative 4 (Recommended Plan): This alternative, when compared to Action Alternative 3, would simply add a grade control structure to the channel. This impact is almost entirely limited to the channel, and only a marginal amount of vegetation would need to be cleared in order to implement this additional measure. Therefore, impacts to terrestrial habitat under the Recommended Plan are as described under Action Alternative 3. Since the amount of bottomland hardwood forest that would be lost under the Recommended Plan is less than 0.1 acres and cleared areas would be allowed to revegetate over time, the impact to bottomland hardwood forests is minimal and no mitigation is proposed. Disturbed areas would be reseeded with native species to prevent the spread of invasive plants. Effects to terrestrial habitat by indirectly caused actions would be similar to the direct effects. The short-term and long-term effect to terrestrial habitats would be minor.

Action Alternative 5: Construction activities are more extensive under this alternative than any of the others evaluated. However, given the overall small scale of the Natural Reach and the limited quality of habitat present, impacts to terrestrial habitat under this alternative would still be minor in the short-term and long-term. As with the other action alternatives, less than 0.1 acres of bottomland hardwood forest would be removed and cleared areas would be allowed to revegetate over time. Thus, the impact to bottomland hardwood forests would be minimal. Disturbed areas would be reseeded with native species to prevent the spread of invasive plants.

3.5 Fish and Wildlife

3.5.1 Existing Conditions

Fish species commonly observed in Turkey Creek includes the red shiner (*Cyprinella lutrensis*), green sunfish (*Lepomis cyanellus*), fathead minnow (*Pimephales promelas*), and creek chub (*Semotilus atromaculatus*; Welker and Huggins, 1997). These species of fish are known to be tolerant of degraded waters. The steep grade of the Turkey Creek Tunnel as it enters the Kansas River usually prevents fish from moving into Turkey Creek, however, some passage is possible. Because Turkey Creek is relatively smaller stream with few deep pools it is unlikely to sustain larger fish from the Kansas River. Fish and macroinvertebrate communities in Turkey Creek are severely degraded by both point and non-point sources of pollution (Welker and Huggins, 1997). The wastewater treatment plant provides a constant flow of warm water that creates open water in the winter months that could be used by waterfowl.

Wildlife residing within the riparian corridor includes small mammals such as eastern cottontail rabbit (*Sylvilagus floridanus*), gray squirrel (*Sciurus carolinensis*), Fox squirrel (*Sciurus niger*), Virginia opossum (*Didelphis virginiana*), and raccoon (*Procyon lotor*), among others. Larger mammals include whitetail deer (*Odocoileus virginianus*), red fox (*Vulpes vulpes*), and coyote (*Canis latrans*). Various species of birds, reptiles, amphibians, and invertebrates also inhabit areas of Turkey Creek.

3.5.2 Environmental Consequences

No Action Alternative: Under the NAA, no construction activities would be undertaken. Thus, there would be no short-term effect to fish and wildlife. Ongoing loss of riparian habitat, unresolved sedimentation issues, and indirectly caused actions would have minor impacts to fish and wildlife in the long-term.

Action Alternative 1: Fish and wildlife would be impacted in the short-term during construction. However, given the small scale of the construction, the implementation of BMPs (e.g., silt fences to reduce sedimentation), and the fact that the Natural Reach is inhabited by edge and urban adaptive species tolerant of disturbances, this effect would be minor. This would also be anticipated for indirectly caused actions in the Natural Reach. Aquatic organisms benefit in the long-term by a reduction in erosion and sedimentation. Terrestrial wildlife is adversely impacted in the long-term by the loss of vegetation, though this effect is mitigated by the preservation of the Natural Reach's bottomland hardwood forest habitat which would only experience minimal impacts.

Action Alternative 2: Minor short-term impacts to fish and wildlife under this alternative are substantially similar to Action Alternative 1. Vegetation clearing would occur at the same places as in Action Alternative 1. Stone toe protection results in a greater reduction in erosion and sedimentation in Turkey Creek. Minor adverse long-term effects would be anticipated for terrestrial wildlife, and beneficial long-term effects would be anticipated for aquatic wildlife.

Action Alternative 3: This alternative, when compared to Action Alternative 2, would expand construction activities to the right bank but the effect of this expansion on the Natural Reach's fish and wildlife resources would be negligible. Short-term construction effects would be minor and adverse for all fauna, and aquatic and terrestrial wildlife would experience beneficial and minor adverse effects in the long-term, respectively.

Action Alternative 4 (Recommended Plan): This alternative, when compared to Action Alternative 3, would simply add a grade control structure to the channel. However, because this measure would only impact 30 linear feet of stream, the increase in impact to aquatic fauna would be negligible. Once installed, this grade control structure would act as riffle habitat. Thus, minor adverse short-term effects and beneficial long-term effects would be anticipated for aquatic fauna. Impacts to terrestrial fauna would be as described under Action Alternative 3.

Action Alternative 5: Construction activities are more extensive under this alternative than any of the others evaluated. However, the scale of construction under this alternative is still small in absolute terms and thus does not pose a significant threat to the edge and urban adaptive species present in the Natural Reach. Effects to aquatic organisms would be minor and adverse in the short-term and beneficial in the long-term. Effects to terrestrial wildlife would be minor in the short-term and long-term.

3.6 Threatened and Endangered Species

3.6.1 Existing Conditions

Federally Listed Species

An official list of federally protected species was generated using the US Fish and Wildlife Service (USFWS) automated Information for Planning and Consultation (IPaC) website. The list generated by the IPaC website included three species that could potentially be affected by activities near the Natural Reach. The presence of a species on the list does not indicate presence within the Natural Reach.

Table 3. Federally listed species potentially present in the Natural Reach area.

Taxa	Scientific Name	Common Name	Federal Status	Federal critical habitat w/n project area
Insect	<i>Danaus plexippus</i>	Monarch Butterfly	Candidate	No
Mammal	<i>Myotis septentrionalis</i>	Northern Long-eared Bat	Endangered	No

The northern long-eared bat was listed as a threatened species in 2015 and then reclassified as an endangered species in 2023 due to declines mostly associated with white-nose syndrome. The bats spend winter hibernating in caves and mines. During the summer, the bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live trees and snags. Males and non-reproductive females may also roost in cooler places, like caves and mines. Like other listed bat species, northern long-eared bats have experienced a population decline resulting from white-nose syndrome and human disturbance (USFWS, 2023b). Site visits by Corps biologists confirmed the presence of multiple living and dead trees with the sufficient size (three inches diameter at breast height [4.5 feet] or greater) and characteristics (exfoliating bark, crevasses, etc.) to make them suitable for summer roosting by northern long-eared bat.

Pallid sturgeon was identified on the IPaC-generated species list for the Natural Reach. However, lower Turkey Creek is not a stream system which would sustain adult pallid sturgeon and at its confluence with the Kansas river fish passage is limited due to the steep gradient of the Turkey Creek Tunnel. Thus, it is unlikely larval or juvenile pallid sturgeon would enter or reside in Turkey Creek. USFWS concurs that the species' presence in the Natural Reach and the potential for bank stabilization activities in this stream to impact this species is highly negligible (see Appendix G).

Monarch butterfly is currently listed as a candidate species, and thus does not receive formal protection under ESA - unlike northern long-eared bat and pallid sturgeon. The Natural Reach appears to lack habitat supporting monarch butterfly's life cycle. This

species only lays eggs on milkweed plants, and the only grassy areas in the Natural Reach include a mowed right of way of the I-35 North Mission Road exit and a mowed field north of I-35 and west of South Mill Street. Routine mowing in both locations prevents the establishment of forbs, including milkweed.

No federally designated critical habitat is identified within the Natural Reach.

State Listed Species

The Kansas Department and Wildlife and Parks maintains a list of state listed species under the Kansas Nongame and Endangered Species Conservation Act of 1975. The list of state listed species potentially present in Wyandotte County, Kansas is provided in the table below. Note that this list includes some federally listed species, including some species not identified in the USFWS IPaC list. These species are bolded in the table below.

Table 4. State listed species identified within Wyandotte County, Kansas.

Taxa	Scientific Name	Common Name	State Status
Bird	Charadrius alexandrinus	Snowy Plover	Threatened
	Charadrius melodus	Piping Plover	Threatened
	Sterna antillarum	Least Tern	Endangered
Fish	Hybognathus argyritis	Western Silvery Minnow	Threatened
	Hybognathus placitus	Plains Minnow	Threatened
	Macrhybopsis gelida	Sturgeon Chub	Threatened
	Macrhybopsis hyostoma	Shoal Chub	Threatened
	Macrhybopsis meeki	Sicklefin Chub	Endangered
	Macrhybopsis storeriana	Silver Chub	Endangered
	Platygobio gracilis	Flathead Chub	Threatened
	Scaphirhynchus albus	Pallid Sturgeon	Endangered
Insect	Nicrophorus americanus	American Burying Beetle	Endangered
Mammal	Spilogale putorius	Eastern Spotted Skunk	Threatened

3.6.2 Environmental Consequences

No Action Alternative: The NAA would have negligible impacts to federally listed species. The Natural Reach does not support habitat for pallid sturgeon or monarch butterfly. No tree removal activities would occur as a direct consequence of this alternative, and the potential loss of trees along Turkey Creek due to erosion would not

be substantial. While this alternative is likely to indirectly cause future stabilization actions in the Natural Reach, it can be reasonably assumed that these activities would observe seasonal tree clearing restrictions to avoid potential impacts to northern long-eared bat.

Action Alternative 1: This alternative would result in negligible impacts to federally listed species. While tree removal, including removal of trees that may serve as suitable summer roosting sites for northern long-eared bat, would occur, all tree removal would occur within the seasonal restrictive window from November 1 to March 31. Thus, adverse impacts to this species are avoided. While it is possible that this alternative would indirectly cause future stabilization actions in the Natural Reach, it can be reasonably assumed that these activities would observe seasonal tree clearing restrictions to avoid potential impacts to northern long-eared bat.

Action Alternative 2: Impacts to federally listed species under this alternative are as described under Action Alternative 1.

Action Alternative 3: Impacts to federally listed species under this alternative are as described under Action Alternative 1.

Action Alternative 4 (Recommended Plan): The Recommended Plan would have negligible effects on federally listed species. This SEA represents the assessment and findings regarding the Supplemental Project and serves as the Biological Assessment with a determination of “not likely to adversely affect” (NLAA) for northern long-eared bat and “no effect” to pallid sturgeon. This SEA will be provided to USFWS for comment. USFWS concurred with the Corps’ NLAA determination for northern long-eared bat on 30 March 2023 via the Northern Long-eared Bat Rangelwide Determination Key (see Appendix G). Any comments provided by USFWS or other agencies are included in Appendix G.

Action Alternative 5: Impacts to federally listed species under this alternative are largely as described under Action Alternative 1, though this alternative is not anticipated to indirectly cause additional bank stabilization activities in the Natural Reach.

3.7 Cultural Resources

3.7.1 Existing Conditions

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (amended June 17, 1999) requires Federal agencies to take into account the effects of their undertakings on historic properties. By definition, historic properties are properties eligible for or listed on the National Register of Historic Places (NRHP). Federal undertakings refer to any federal involvement including funding, permitting, licensing, or approval. Federal agencies are required to define and document the Area of Potential Effect (APE) for undertakings. The APE is defined as the geographic area or areas

within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if such properties exist.

A literature and background review of the proposed project area has been completed. The review consisted of an examination of the NRHP, archeological site location maps in the Corps and the Kansas State Historical Society offices, and other pertinent records, such as historic city maps and aerial images. In addition, the Corps funded an archeological survey of the proposed project area in 1998 and a historic structures survey in 2002. The Corps coordinated the studies with the SHPO in 2002. At that time, the Corps recommended that no historic properties would be adversely affected by the proposed action. The SHPO concurred with these recommendations in a letter dated August 13, 2002.

No NRHP listed properties are located within the proposed APE. However, the background review identified a number of NRHP or NRHP eligible properties in the Turkey Creek basin such as: the Anthony Sauer Residence, the Rosedale World War I Memorial Arch, the George Ruston Baking Company, Rosedale City Hall and Fire Station No. 1. All of these properties are located well outside of the APE. The field work found no archeological sites within the proposed APE. One structure, the Boulevard Drive-In Theater, located west of the Natural Reach was determined to be potentially eligible for the NRHP.

Since the 2002 coordination, project plans changed following a value engineering study. The APE has increased slightly in scope. The length of the Supplemental Project remains the same while impacts along the channel have widened slightly. Additional field survey, in conjunction with the geotechnical bore hole data, has confirmed that the APE has been highly disturbed and thus the Supplemental Project will have no effect on historic properties. The Kansas SHPO agreed with this conclusion in a letter dated February 24, 2022. Tribes were consulted, as required by statute, on the Supplemental Project and responses were received from the Eastern Shawnee Tribe of Oklahoma and Iowa Tribe of Kansas and Nebraska also agreeing that there were no concerns.

3.7.2 Environmental Consequences

No Action Alternative: No action would be taken under the NAA and therefore no effect to cultural resources would occur.

Action Alternative 1: This alternative is not expected to negatively impact any cultural resources. No NRHP eligible properties or other cultural resources are known to occur or would be adversely affected by this alternative. The SHPO has concurred that the Supplemental Project's APE has "virtually no potential for intact surface or buried cultural resources (see Appendix G). If in the unlikely event that archeological material is discovered during project construction, work in the area of discovery would cease until the discovery is investigated by a qualified archeologist and coordinated with the SHPO and federally recognized Native American tribes.

Action Alternative 2: Impacts to cultural resources under this alternative are as described under Action Alternative 1.

Action Alternative 3: Impacts to cultural resources under this alternative are as described under Action Alternative 1.

Action Alternative 4 (Recommended Plan): Impacts to cultural resources under the Recommended Plan are as described under Action Alternative 1.

Action Alternative 5: Impacts to cultural resources under this alternative are as described under Action Alternative 1.

3.8 Socioeconomics and Environmental Justice

3.8.1 Existing Conditions

In January of 2020, President Biden issued Executive Order 14008. The order directed the Council on Environmental Quality (CEQ) to develop the Climate and Economic Justice Screening Tool. The tool has an interactive map and uses datasets that are indicators of burdens in eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development. The tool uses this information to identify communities that are experiencing these burdens. These communities are disadvantaged because they are overburdened and underserved.

The Climate and Economic Justice Screening Tool identifies five out of nine US Census tracts within one mile of the Natural Reach as disadvantaged (US Census tracts 20209042800, 20209043000, 20209043301, 20209045000, and 20209045100). Table 5 below describes the specific disadvantages that have been identified for these tracts.

Table 5. Climate and Economic Justice Screening Tool results.

Category	Disadvantage	Description	Number of Tracts
Climate Change	Projected flood risk	Projected risk to properties from projected floods, from tides, rain, riverine and storm surges within 30 years.	1
Energy	Energy cost	Average annual energy costs divided by household income.	2
Health	Diabetes	Share of people ages 18 years and older who have diabetes other than diabetes during pregnancy.	1
	Heart disease	Share of people ages 18 years and older who have been told they have heart disease.	1
Housing	Historic underinvestment	Share of households making less than 80% of the area median family income and spending more than 30% of income on housing.	4
	Lack of indoor plumbing	Share of homes without indoor kitchens or plumbing.	1
	Lead paint	Share of homes that are likely to have lead paint.	1
Legacy Pollution	Proximity to RMP facilities	Count of Risk Management Plan (RMP) facilities within 5 kilometers.	4
Transportation	Diesel particulate matter exposure	Amount of diesel exhaust in the air.	1
	Traffic proximity and volume	Count of vehicles at major roads within 500 meters.	1
Workforce Development	Poverty	Share of people in households where income is at or below 100% of the Federal poverty level.	1

The USEPA EJScreen tool was used to evaluate the demographics and environmental justice variables for the Natural Reach area (see Appendix F). Table 6 shows the environmental and demographic indicators for this area (“Value” column), and how those indicators compare to the state and national averages.

Table 6. Environmental and demographic indicators of the project area.

Selected Variables	Value	State Avg.	%ile in State	USA Avg.	%ile in USA
Pollution and Sources					
Particulate Matter 2.5 ($\mu\text{g}/\text{m}^3$)	8.41	8	81	8.67	45
Ozone (ppb)	46.5	45.1	90	42.5	84
Diesel Particulate Matter* ($\mu\text{g}/\text{m}^3$)	0.436	0.21	98	0.294	80-90th
Air Toxics Cancer Risk* (lifetime risk per million)	30	25	99	28	80-90th
Air Toxics Respiratory Hazard Index*	0.4	0.33	98	0.36	80-90th
Traffic Proximity (daily traffic count/distance to road)	810	290	92	760	77
Lead Paint (% Pre-1960 Housing)	0.42	0.34	55	0.27	67
Superfund Proximity (site count/km distance)	0.084	0.081	69	0.13	61
RMP Facility Proximity (facility count/km distance)	2.9	1.1	91	0.77	94
Hazardous Waste Proximity (facility count/km distance)	5.6	1.3	97	2.2	89
Underground Storage Tanks (count/km ²)	5.3	3.5	76	3.9	78
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.037	1.8	79	12	78
Socioeconomic Indicators					
Demographic Index	45%	28%	83	35%	70
People of Color	49%	25%	85	40%	66
Low Income	41%	29%	71	30%	69
Unemployment Rate	3%	4%	55	5%	43
Limited English Speaking Households	8%	2%	88	5%	82
Less Than High School Education	15%	9%	80	12%	71
Under Age 5	7%	6%	60	6%	66
Over Age 64	6%	16%	15	16%	14

*Diesel particular matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the EPA's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: <https://www.epa.gov/haps/air-toxics-data-update>.

When compared to the state average averages, the Natural Reach area received higher scores on all of the pollution variables except the wastewater discharge (toxicity-weighted concentration/m distance) measurement. However, in this category the Natural Reach area scored well over the state's median value, placing it in the 79th percentile. Compared to the national average, the Natural Reach area received higher scores on all of the pollution variables except the particulate matter (PM 2.5 in $\mu\text{g}/\text{m}^3$), superfund proximity (site count/km distance), and wastewater discharge measurements. However, the Natural Reach area did score well above the national median for wastewater discharge, placing it in the 78th percentile. The percentages of people of color, low-income population, limited English speaking households, and population with less than high school education around the Natural Reach area are notably higher than the national and state averages. The Natural Reach area is largely comparable to state and national averages when considering other socioeconomic indicators (e.g., unemployment rate).

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, directs federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations. When conducting NEPA evaluations, the Corps incorporates Environmental Justice (EJ) considerations into both the technical analyses and the public involvement in accordance with the USEPA and the Council on Environmental Quality guidance (CEQ, 1997). The CEQ guidance defines "minority" as individual(s) who are members of the following population groups: American Indian or Alaskan native, Asian or Pacific Islander, Black, not of Hispanic origin, and Hispanic. The Council defines these groups as minority populations when either the minority population of the affected area exceeds 50-percent of the total population, or the percentage of minority population in the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographical analysis.

Table 7. Comparison of percentile ranks for various Environmental Justice Indexes for the project area among Kansas and the USA.

Selected Variable	State Percentile	USA Percentile
EJ Index for Particulate Matter 2.5	91	66
EJ Index for Ozone	92	87
EJ Index for Diesel Particulate Matter	92	81
EJ Index for Air Toxics Cancer Risk	87	74
EJ Index for Air Toxics Respiratory Hazard Index	87	76
EJ Index for Traffic Proximity	87	74
EJ Index for Lead Paint	77	75
EJ Index for Superfund Proximity	88	75
EJ Index for RMP Facility Proximity	91	85
EJ Index for Hazardous Waste Proximity	92	83
EJ Index for Underground Storage Tanks	83	80
EJ Index for Wastewater Discharge	89	84

Table 7 shows how EJ indexes for the project area compare to the State of Kansas and the United States. The data indicate that all EJ indices are notably above the state medians, and all but one (Particulate Matter 2.5) are notably above the national medians.

3.8.2 Environmental Consequences

No Action Alternative: No action would be taken under the NAA and therefore no short-term effects to socioeconomics or environmental justice would occur. However, nothing would be done to address the erosion and sedimentation issues that are threatening the performance of the Project in the long-term. While it has been noted before that the NAA would likely indirectly cause future stabilization actions in the Natural Reach, these activities would most likely be focused on preserving road infrastructure and not maintaining the flood risk management benefits of the Project. As noted above in Table 5, communities around the Natural Reach have been identified as disadvantaged. Flood risk has contributed to this identification. As a consequence, long-term environmental justice impacts are possible under the NAA.

Action Alternative 1: Construction activities under this alternative would have a negligible effect on environmental justice in the short-term. These activities are small enough in scale and intensity that they wouldn't have significant effects relating to

particulate matter, ozone, diesel particulate matter, traffic proximity, or other environmental justice factors listed in Table 5 and Table 7. For example, air quality impacts under this alternative would only be minor, localized, and temporary (see Section 3.10.2). The same would be expected of any stabilization actions that would be indirectly caused by this alternative. The local community may experience a small socioeconomic benefit from the business and job opportunities associated with construction. This alternative is anticipated to have long-term environmental justice benefits by helping to maintain the Project's flood risk management performance. This would directly help the local community by mitigating flood risk.

Action Alternative 2: When compared to Action Alternative 1, construction activities would only be slightly expanded under this alternative. Short-term increases in diesel particulate matter and other environmental justice factors would still be minor in absolute terms, though the community may experience slightly greater benefits to socioeconomics in the short-term and environmental justice in the long-term.

Action Alternative 3: This alternative would expand construction activities further relative to Action Alternative 2, though again by only a modest amount. The small increase in the use of construction equipment would not be expected to worsen environmental justice indexes related to air quality. This alternative would nominally increase the short-term socioeconomic benefits and long-term environmental justice benefits.

Action Alternative 4 (Recommended Plan): The only difference between the Recommended Plan and Action Alternative 3 is the addition of a grade control structure to Turkey Creek. This represents a very small increase in construction activities, and so the socioeconomic and environmental justice impacts under the Recommended Plan are largely the same as under Action Alternative 3. The benefits under the Recommended Plan would be greater, though again not substantially so.

Action Alternative 5: Construction activities under Action Alternative 5 are more extensive than under any of the other considered alternatives. Regardless, the small overall scale and low intensity of the proposed action would keep the short-term environmental justice impacts negligible. The increase in work performed relative to the other action alternatives would be modest. This alternative would result in the greatest short-term socioeconomic benefits and long-term environmental justice benefits, exceeding the Recommended Plan by a nominal amount.

3.9 Hazardous Toxic and Radioactive Wastes (HTRW)

3.9.1 Existing Conditions

A general hazardous, toxic, and radioactive waste (HTRW) assessment was performed in 2001 along the Turkey Creek corridor as part of the GRR. In researching potential contamination issues, this information was recently reviewed by the Corps and a new database search was conducted. While no new contaminants were identified in the

Natural Reach, a number of incidents have been reported in the general surrounding area. These incidents are summarized below and in Appendix E.

Since the previous assessment, there have been nine active facilities on the KDHE Identified Sites List within one mile of the Natural Reach. Three of these incidents are still active pending resolution. One of these sites, a former Betty Brite dry cleaning facility, has no listed contamination. Another site, the 2555 South Ferree property, has heavy metal, polychlorinated biphenyl (PCB), and refined petroleum contamination, and put an environmental use control (EUC) in place in 2018. The third site, Rode Cleaners, has refined petroleum contamination. Contaminations from facilities that have been resolved since the 2001 HTRW assessment include volatile organic compounds and refined petroleum. There is no evidence that contamination from any of these sites has migrated to the Natural Reach area.

There are 28 Resource Conservation and Recovery Act (RCRA) hazardous waste facilities within 0.5 miles of the Natural Reach. Eight of these are active very small quantity generator facilities. One of these is an active small quantity generator facility. No facilities have any identified RCRA violations within the past three years.

Six spills have been reported to KDHE within 0.5 miles of the Natural Reach since the 2001 HTRW assessment, and eight other spills that were reported prior to that assessment. One incident reportedly spilled electrical insulating oil, while other incidents do not have reported contaminants and all fourteen incidents have been closed.

According to KDHE, there have been three leaking underground storage tank (LUST) incidents within 0.5 miles of the Natural Reach from 2001 onwards. Two of these incidents, one involving hydraulic oil and one without a listed substance, have since been closed. The third site, located at a Hinckley Springs Water Company facility, involved a motor oil and diesel leak and is currently enrolled in the Voluntary Clean Up and Property Redevelopment Program. Two of the pre-2001 reported sites still have a “monitor” status: a gasoline leak at Go Gas Café reported in 1991 as well as a gasoline and diesel leak at McCall’s Service #1 reported in 1999. All other incidents are closed.

3.9.2 Environmental Consequences

No Action Alternative: No action would be taken under the NAA and no HTRW substances would be generated. Therefore, no effect to HTRW substances would occur.

Action Alternative 1: Known contamination sources in the vicinity of the Natural Reach would not be anticipated to prevent the implementation of this alternative. Potential hazardous and/or toxic exposures during construction activities would not be anticipated under this alternative, and the use of standard operating procedures and specifications covering health and safety, environmental exposure, and appropriate disposal can minimize exposure risk. Nevertheless, the potential for unexpected hazardous/toxic exposures cannot be entirely ruled out due to the Natural Reach’s urban developed

setting. Strict adherence to health and safety plans and project specifications are important for avoiding potential HTRW impacts. No HTRW substances would be produced by this alternative. Any HTRW impacts would most likely be negligible and short-term.

Action Alternative 2: Impacts related to HTRW substances under this alternative are as described under Action Alternative 1.

Action Alternative 3: Impacts related to HTRW substances under this alternative are as described under Action Alternative 1.

Action Alternative 4 (Recommended Plan): Impacts related to HTRW substances under the Recommended Plan are as described under Action Alternative 1.

Action Alternative 5: Impacts related to HTRW substances under this alternative are as described under Action Alternative 1.

3.10 Air Quality

3.10.1 Existing Conditions

The U.S. Environmental Protection Agency (USEPA) Office of Air Quality Planning and Standards has set National Ambient Air Quality Standards (NAAQS) for six principal pollutants referred to as “criteria” pollutants. They are carbon monoxide, nitrogen dioxide, ozone, lead, particulates of 10 microns or less in size (PM-10 and PM-2.5), and sulfur dioxide. Ozone is the only parameter not directly emitted into the air but forms in the atmosphere when three atoms of oxygen (O₃) combine via a chemical reaction between oxides of nitrogen (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. Motor vehicle exhaust, industrial emissions, gasoline vapors, and chemical solvents are major sources of NO_x and VOC, also known as ozone precursors. Strong sunlight and hot weather can cause ground-level ozone to form in harmful concentrations in the air.

As of 31 March 2023, Wyandotte County in Kansas had attainment status for all criteria pollutants (USEPA, 2023a).

3.10.2 Environmental Consequences

No Action Alternative: No construction activities would be directly caused by the NAA, thereby preventing any short-term effect to air quality. However, construction activities that are likely to be indirectly caused by the NAA would very likely emit diesel fuel fumes, exhaust, and fugitive dust. Greenhouse gases emissions are discussed above in Section 3.1.2. These potential long-term impacts to air quality would be minor, localized, and temporary due to the small scale of anticipated activities under the NAA and the dispersion of fumes and exhaust during equipment downtime.

Action Alternative 1: Construction activities under this alternative would require the use of heavy equipment that emit diesel fuel fumes and exhaust, and fugitive dust would be made airborne from construction activities. However, this alternative would not require nonstop construction and as such, equipment downtime would allow for dispersion of any fumes or fugitive dust generated during construction. In addition, dust control BMPs would be implemented to reduce the impact of fugitive dust, as required by National Pollutant Discharge Elimination System (NPDES) permits. Greenhouse gas emissions caused by this alternative are discussed above in Section 3.1.2. Thus, there would only be minor impacts to air quality in the short-term. Emissions associated with potential stabilization activities that may be indirectly caused by this alternative in the long-term are expected to be similar.

Action Alternative 2: While construction activities under Action Alternative 2 are slightly more extensive when compared to Action Alternative 1, the increase in potential air quality impact would be marginal. Any air quality effects are anticipated to be minor, localized, and temporary.

Action Alternative 3: While construction activities under Action Alternative 3 are slightly more extensive when compared to Action Alternative 2, the increase in potential air quality impact would be marginal. Any air quality effects are anticipated to be minor, localized, and temporary.

Action Alternative 4 (Recommended Plan): While construction activities under the Recommended Plan are slightly more extensive when compared to Action Alternative 3, the increase in potential air quality impact would be marginal. Any air quality effects are anticipated to be minor, localized, and temporary.

Action Alternative 5: While construction activities under Action Alternative 5 would be more extensive than any of the other evaluated alternatives, the effect to air quality would still be minor and temporary. All mitigating factors discussed with Action Alternative 1 would also apply to this alternative.

3.11 Noise

3.11.1 Existing Conditions

Sound levels within the vicinity of the Natural Reach primarily vary based on time of day. The main source of noise within the Natural Reach is the everyday vehicular traffic along I-35, typically between 50 and 60 “A-weighted” decibels (dBA) at 100 feet.

3.11.2 Environmental Consequences

No Action Alternative: No action would be taken under the NAA and no noise would be generated. Noise effects associated with construction activities that are likely to be indirectly caused by the NAA would most likely be minor and temporary.

Action Alternative 1: Noise associated with this alternative would be limited to noise generated during construction activities. The noise associated with construction would only occur during daylight hours. Noise is measured as Day Night average noise levels (DNL) in “A-weighted” decibels to which the human ear is most sensitive (dBA). No federal standards exist for allowable noise levels. The Federal Aviation Administration (FAA) denotes a DNL of about 65 dBA as the level of significant noise impact. Several other agencies, including the Federal Energy Regulatory Commission, use a DNL criterion of 55 dBA as the threshold for defining noise impacts in suburban and rural residential areas. Table 8, below, provides the Occupational Safety and Health Administration’s (OSHA) guidance for temporary permissible noise exposure levels (OSHA, 2023).

Table 8. OSHA Permissible Noise Exposures

Duration per day, hours	Noise level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

Construction noise would be similar to other machinery used in the local area. Common equipment used during construction (e.g., backhoe) generally emit noise levels around 85 dBA at 45 feet. Construction equipment would be operated during daylight hours, and exposure times are not anticipated to exceed levels described in Table 8. Action Alternative 1 would therefore be expected to result in minor short-term noise impacts. Noise associated with potential stabilization activities that may be indirectly caused by this alternative in the long-term are expected to be similar.

Action Alternative 2: While construction activities under Action Alternative 2 are slightly more extensive when compared to Action Alternative 1, this would result in only a brief extension of noise effects. Noise effects under this alternative would be minor and short-term.

Action Alternative 3: While construction activities under Action Alternative 3 are slightly more extensive when compared to Action Alternative 2, this would result in only

a brief extension of noise effects. Noise effects under this alternative would be minor and short-term.

Action Alternative 4 (Recommended Plan): While construction activities under the Recommended Plan are slightly more extensive when compared to Action Alternative 3, this would result in only a brief extension of noise effects. Noise effects under this alternative would be minor and short-term.

Action Alternative 5: While construction activities under Action Alternative 5 would be more extensive than any of the other evaluated alternatives, noise effects would still be minor and short-term.

3.12 Traffic and Transportation

3.12.1 Existing Conditions

The Natural Reach is adjacent to several roadways. The Natural Reach is bordered on the north by I-35 and the I-35 Southwest Boulevard offramp, the latter of which crosses over Turkey Creek. The streambank adjacent to the offramp is eroding as previously noted. The Natural Reach is bordered to the south by Seminary Street and to the west by South Mill Street. A small bridge over Turkey Creek connects these two roadways.

3.12.2 Environmental Consequences

No Action Alternative: No action would be taken under the NAA and no short-term effects would occur to traffic or transportation. While the ongoing erosion at Turkey Creek is threatening to damage I-35 infrastructure, it is highly probable that another agency (e.g., Kansas Department of Transportation) would eventually stabilize at least part of the Natural Reach's streambank in order to prevent this from occurring. Thus, the Corps does not anticipate the loss of I-35's function under the NAA. Traffic disruptions from indirectly caused actions are anticipated to be similar to the action alternatives, and therefore minor and temporary.

Action Alternative 1: Construction activities under this alternative are likely to disrupt typical traffic along South Mill Street and Seminary Street near the Natural Reach. However, because alternate routes are easily accessible for the local traffic, this short-term impact would only be minor. Implementation of this alternative would help to preserve I-35 from erosion, maintaining its function for local and regional traffic in the long-term.

Action Alternative 2: Impacts related to traffic and transportation under this alternative are largely as described under Action Alternative 1. While the modestly increased extent of construction activities under this alternative would extend the duration of traffic disruptions relative to Action Alternative 1, this increase would be negligible in effect. The short-term impact would be minor.

Action Alternative 3: Impacts related to traffic and transportation under this alternative are as largely as described under Action Alternative 1. While the modestly increased extent of construction activities under this alternative would extend the duration of traffic disruptions relative to Action Alternative 2, this increase would be negligible in effect. The short-term impact would be minor.

Action Alternative 4 (Recommended Plan): Impacts related to traffic and transportation under the Recommended Plan are as described under Action Alternative 1. While the modestly increased extent of construction activities under the Recommended Plan would extend the duration of traffic disruptions relative to Action Alternative 3, this increase would be negligible in effect. The short-term impact would be minor.

Action Alternative 5: Impacts related to traffic and transportation under this alternative are as largely described under Action Alternative 1. While construction activities are more extensive under Action Alternative 5 than any of the other evaluated alternatives, the difference in the duration of disruptions between this alternative and Action Alternative 1 would be small in absolute terms. Thus, the short-term impact to traffic and transportation would still be minor.

3.13 Cumulative Effects

NEPA requires Federal agencies to consider not only the direct and indirect impacts of a proposed action, but also the cumulative impacts of the action. A cumulative impact is defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions” (40 CFR § 1508.1(g)). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. These actions include on- or off-site projects conducted by government agencies, businesses, or individuals that are within the spatial and temporal boundaries of the actions considered.

While the Project has thus far not included any actions within the Natural Reach, it has implemented flood risk management measures upstream and downstream of this area in the Restored Channel and Walled Channel reaches. These measures include the construction of levees, channel widening, channel deepening, and bridge modifications. Additional flood risk management measures are planned further upstream of these areas. The Upper Turkey Creek Johnson County and Wyandotte County, Kansas Flood Risk Management Project Feasibility Report recommends levees; floodwalls; a gravity-drained detention pond; stormwater, water, and sanitary sewer relocations; and seven acres of forest planting. These Upper Turkey Creek measures would be located approximately 3.85 miles southwest of the Natural Reach, or approximately 4.35 instream miles upstream. Additionally, the UG has previously undertaken and may continue to periodically undertake sediment removal activities in the Walled Channel reach to prevent substantial accumulation and a corresponding rise in WSE. The Corps

is unaware of any other notable actions proposed near the Natural Reach. Because this area is already developed for transportation as well as industrial, commercial, and residential land uses, the Corps anticipates that other actions taken around the Natural Reach would be garden-variety, routine activities meant to maintain these current land uses.

3.13.1 No Action Alternative

The NAA would be expected to result in minor long-term impacts to soils, flooding, water quality, terrestrial habitat, fish and wildlife, and environmental justice. As previously discussed, these effects are largely the cumulative result of previously implemented Project measures, which have altered the hydraulic conditions of the Natural Reach. Actions indirectly caused by the NAA would likely result in minor, temporary impacts to noise, air quality, and traffic via construction as well. Construction activities proposed in the Upper Turkey Creek reach are anticipated to result in minor short-term effects to soils, hydraulics, water quality, terrestrial habitat, and fish and wildlife, noise, air quality, and traffic. However, given the small scale of these impacts and the distance between the Upper Turkey Creek reach and the Natural Reach, the potential for these impacts to be cumulatively significant is negligible.

While levees and floodwalls in the Upper Turkey Creek reach are anticipated to result in long-term impacts to Turkey Creek's hydraulics, hydraulic modeling has indicated that these measures would not increase flooding downstream of the Upper Turkey Creek reach (USACE, 2015). Thus, the potential for these actions and the NAA to result in cumulatively significant impacts to flooding along Turkey Creek is negligible.

As Section 3.3.2 outlines, the NAA would not address the accumulation of sediment in the Walled Channel reach downstream of the Natural Reach. This material would reduce the channel's capacity, causing a long-term adverse impact to flooding. However, the UG has previously undertaken and may continue to periodically undertake sediment removal activities in the Walled Channel reach to counteract this gradual rise in WSE and maintain the flood risk management benefits of the Project. The cumulative impact of these sediment removal activities is anticipated to prevent significant flooding impacts, though they increase the long-term maintenance costs of the Project for the UG. These activities have not resulted in significant water quality impacts in the past and the Corps expects this to continue to be the case.

Other maintenance activities in the general area around the Natural Reach are anticipated to be small, routine actions typical of urban areas, such as minor road repair. These kinds of actions would be too small in scale, frequency, and intensity to meaningfully raise the potential for significant cumulative effects. Thus, the cumulative impact of these maintenance actions is considered negligible.

3.13.2 Action Alternatives Including the Recommended Plan

The action alternatives, including the Recommended Plan, are analyzed together for their potential to incur significant cumulative effects due to their similarity. In general, alternatives that are larger in scale have an inherently larger potential for significant cumulative effects. Action alternatives 1 through 5 feature progressively larger amounts of proposed activities, but each increase is small and the difference between Action Alternative 1 and Action Alternative 5 is not substantial in absolute terms. This, in addition to the qualitative similarity between the action alternatives, means that the Corps does not anticipate a significant difference in the potential of cumulative effects between these alternatives.

Construction activities under the action alternatives are expected to result in minor, short-term impacts to soils, water resources, terrestrial habitat, fish and wildlife, air quality, noise, and traffic. These impacts are highly similar to construction-related impacts expected in the Upper Turkey Creek reach, though again the distance between these two areas greatly diminishes the potential for significant cumulative effects. The Corps would implement BMPs in all instances, so even if construction activities were to occur simultaneously, temporarily increased soil erosion and stream turbidity would be too small in intensity to become cumulatively significant. The distance between the Natural Reach and the Upper Turkey Creek reach makes the potential for cumulatively significant air quality, noise, and traffic impacts negligible.

The environments along the Natural Reach and Upper Turkey Creek reach are highly similar: riparian habitats that are heavily disturbed by urban development and inhabited by edge and urban adaptive species. The action alternatives would result in a long-term adverse impact to terrestrial habitat and fauna due to the loss of riparian vegetation. However, due to the action alternatives working around the bottomland hardwood forest in the Natural Reach and the replanting of seven acres of forest in the Upper Turkey Creek reach, riparian habitat is maintained throughout Turkey Creek. This, in addition to the animals inhabiting these areas being edge and urban adaptive species that tolerate these kinds of disturbances, means that there would be no significant cumulative impact to terrestrial habitat or fauna.

The cumulative effect of these action alternatives with the previously implemented measures in the Restored Channel and Walled Channel reaches would be the maintenance of the Project's flood risk management benefits. The impacts that these earlier measures had on the resources analyzed in this SEA were not significant and none of the action alternatives would push these effects into significance. Hydraulic modeling conducted for the Recommended Plan indicates that the action alternatives would increase WSE in the Restored Channel and Natural Reach. The cumulative impact to each of the affected reaches are discussed individually below:

- **Restored Channel:** The action alternatives are anticipated to raise WSE in the Restored Channel slightly above current WSE, which has not significantly changed since the implementation of other Project measures. Due to the

previously constructed levee in the Restored Channel reach, this increase would not add any structures to the 0.01 AEP floodplain.

- **Natural Reach:** The action alternatives are anticipated to raise WSE in the Natural Reach above the current WSE here. However, the WSE in this reach has been declining following the implementation of other Project measures as a result of erosion. Modeling indicates that the raised WSE following the implementation of the action alternatives would still be below the WSE that was established in this reach following the implementation of other Project measures.
- **Walled Channel:** It is not anticipated that the action alternatives would raise WSE in this reach. Sediment accumulating in the Walled Channel is likely raising WSE here, and the stabilization of the Natural Reach would reduce the transport of sediment into Walled Channel.

The cumulative effect to flooding by the action alternatives and previously implemented Project measures is beneficial. The flood risk benefits achieved in the Walled Channel are better maintained by reducing accumulating sediment from the Natural Reach. The action alternatives would address erosion impacts that were not anticipated earlier in the Project without raising WSE in the Natural Reach beyond what it was after the implementation of earlier Project measures. The minor increase in WSE in the Restored Channel is cumulatively rendered inconsequential due to the previous construction of levees there as part of the Project. Because none of the action alternatives would entirely eliminate sediment from entering the Walled Channel reach, sediment removal activities in the Walled Channel reach may occur. However, reducing the sedimentation rate would also reduce the frequency of sediment removal activities needed to maintain the Project's flood risk management benefits. Thus, the action alternatives would reduce the UG's maintenance costs in the long-term. Sediment removal activities in the Walled Channel reach would not occur simultaneously with any of the action alternatives, thus making the risk of cumulatively significant impacts to water quality negligible.

Other maintenance activities in the general area around the Natural Reach are anticipated to be small, routine actions typical of urban areas, such as minor road repair. These kinds of actions would be too small in scale, frequency, and intensity to meaningfully raise the potential for significant cumulative effects even if some were to occur simultaneously with construction activities under the action alternatives. Thus, the cumulative impact of these maintenance actions is considered negligible.

4.0 COORDINATION AND COMMENTS

In compliance with NEPA and Corps policies, input on the draft SEA and draft FONSI was solicited from the public and other governmental agencies. During the scoping period for the SEA, the Corps notified government agencies of the Supplemental Project and requested their input regarding the proposed activities. Kansas Department of Transportation (KDOT), KDWP, and USFWS submitted comments during the scoping period. The public was invited to comment during the public review period of the SEA

and FONSI. Table 9 will be updated as more comments are received. All comments received are included in Appendix G.

Table 9. Public comments.

Nature of Comment	Time Received	USACE Response
<p>KDOT voiced support for any actions taken to restore the channel and to repair and protect slopes associated with I-35 and the I-35 Southwest Boulevard offramp</p>	<p>Scoping Period</p>	<p>USACE acknowledges this support and will keep KDOT abreast of any relevant updates to the proposed action.</p>
<p>KDWP provided a summary of previous fish and wildlife surveys taken of Turkey Creek.</p>	<p>Scoping Period</p>	<p>USACE has incorporated this information into Sections 3.5 and 3.6.</p>
<p>USFWS considers northern long-eared bat and monarch butterfly as potentially present. While pallid sturgeon was identified by the IPaC species list, the proposed action's locality and distance from the Kansas River makes the potential for impacts to this species "highly negligible."</p>	<p>Scoping Period</p>	<p>USACE has incorporated this information into Section 3.6.</p>

5.0 AGENCY COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS

Federal Policy	Compliance*
Archeological Resources Protection Act, 16 U.S.C. 470, et seq.	Full Compliance
Bald and Golden Eagle Protection Act, 16 U.S.C. 668-668d , et seq.	Full Compliance
Clean Air Act, as amended, 42 U.S. C. 7401-7671g, et seq.	Full Compliance
Clean Water Act (Federal Water Pollution Control Act), 33 U.S.C. 1251, et seq.	In-Progress
Coastal Zone Management Act, 16 U.S.C. 1451, et seq.	Not Applicable
Endangered Species Act, 16 U.S.C. 1531, et seq.	In-Progress
Environmental Justice (Executive Order 12898)	Full Compliance
Estuary Protection Act, 16 U.S.C. 1221, et seq.	Not Applicable
Farmland Protection Policy Act, 7 U.S.C. 4201, et. seq.	Full Compliance
Federal Water Project Recreation Act, 16 U.S.C. 4601-12, et seq.	Full Compliance
Fish and Wildlife Coordination Act, 16 U.S.C. 661, et seq.	Full Compliance
Floodplain Management (Executive Order 11988)	Full Compliance
Invasive Species (Executive Order 13122)	Full Compliance
Land and Water Conservation Fund Act, 16 U.S.C. 4601-4, et seq.	Not Applicable
Marine Protection Research and Sanctuary Act, 33 U.S.C. 1401, et seq.	Not Applicable
Migratory Bird Treaty Act, as amended, 16 U.S.C. 703-712, et seq.	Full Compliance
National Environmental Policy Act, 42 U.S.C. 4321, et seq.	In-Progress
National Historic Preservation Act, as amended, 54 U.S.C. 300101, et seq.	Full Compliance

Federal Policy	Compliance*
Protection & Enhancement of the Cultural Environment (Executive Order 11593)	Full Compliance
Protection of Wetlands (Executive Order 11990)	Full Compliance
Rivers and Harbors Act, 33 U.S.C. 403, et seq.	Not Applicable
Watershed Protection and Flood Prevention Act, 16 U.S.C. 1001, et seq.	Full Compliance
Wild and Scenic River Act, 16 U.S.C. 1271, et seq.	Not Applicable

*NOTES: Not applicable. No requirements for the statute required: compliance for the current stage of planning.

Full compliance. Having met all requirements of the statute for the current stage of planning (either preauthorization or post authorization).

In-Progress. Not having met some of the requirements to be in full compliance but anticipated to be in full compliance upon final state of planning.

Noncompliance. Violation of a requirement of the statute.

6.0 CONCLUSION

The Recommended Plan would have negligible effects on federally listed species. The Recommended Plan would have no effect on sites listed, or eligible for inclusion, on the National Register of Historic Places. About 1,500 linear feet more of riparian vegetation would be removed under the Recommended Plan than previously proposed in the 2003 GRR and EA. Minor long-term impacts would occur to terrestrial wildlife as a result of reduced habitat along the stream bank. Areas that would be cleared of vegetation would be reseeded with native plant species to prevent the spread of invasive species. With time, the minor long-term impacts would be reduced as these areas naturally revegetated and trees became reestablished in these disturbed areas. The Recommended Plan would best meet the purpose and need of the Supplemental Project by providing for the desired level of flood risk management and public safety. The Recommended Plan would not result in any significant, long-term impacts to the human or natural environment.

7.0 REFERENCES

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8.0 LIST OF PREPARERS

This draft SEA and FONSI were prepared by Mr. Chris Name, Environmental Resources Specialist, and Mr. Max Headlee, Environmental Resources Specialist, with cultural resource assistance provided by Ms. Gina Powell, District Archeologist, and socioeconomic assistance by Mr. Allen Holland, Senior Economist. The address of the preparers is: U.S. Army Corps of Engineers, Kansas City, District; PM-PR, Room 529, 601 E. 12th Street, Kansas City, Missouri 64106.

9.0 APPENDICES

APPENDIX A

Section 404(b)(1) Evaluation

**Turkey Creek Natural Reach
Turkey Creek Flood Damage Reduction Project
Kansas City, Wyandotte County, Kansas**

Section 404(b)(1) Evaluation

1. Introduction

This Section 404(b)(1) Evaluation is for a supplemental action for the Turkey Creek Flood Damage Reduction Project, Kansas City, Wyandotte County, Kansas (hereafter referred to as the “Project”). This supplemental action will hereafter be referred to as the “Supplemental Project.” This evaluation meets the requirements found in 40 CFR 230, Section 404(b)(1): Guidelines for Specification of Disposal Sites for Dredged and Fill Material. This supplemental evaluation is being conducted to assess effects of the Recommended Plan, as well as environmental changes that have occurred between the original evaluation conducted in 2003 Environmental Assessment (EA) and present day.

2. Project Description

- a. Location:** Turkey Creek is a right bank tributary of the lower Kansas River. The Turkey Creek basin has headwaters in southern Johnson County, Kansas, and drains approximately 15,000 acres before passing through a quarter-mile long tunnel to the Kansas River. Turkey Creek is approximately 15 miles long and runs parallel to I-35 for nearly its entire length. The focus of the Supplemental Project, the Natural Reach, runs approximately 1500 feet between Mill Street and Mission Road in Kansas City, Kansas. The Natural Reach is immediately upstream of the lower Walled Channel reach, and immediately downstream of the Restored Channel reach.
- b. General Description:** The U.S. Army Corps of Engineers - Kansas City District (Corps), in cooperation with the Unified Government of Wyandotte County and Kansas City, Kansas (UG); and the City of Kansas City, Missouri (City), are conducting a flood risk management project along Turkey Creek in Wyandotte and Johnson Counties, Kansas. The purpose of the Project is to reduce flooding risk and associated damages along Turkey Creek. Turkey Creek is a flashy, urban stream with a long history of significant flood events dating back to the 1800s. Much of its original floodplain has been developed for urban uses, including industrial, commercial, and residential areas.

Several EAs and Findings of No Significant Impact (FONSI) have been completed for the Project, most recently in 2015. Flood damage reduction measures that have been implemented as part of the Project include the construction of levees, channel widening, channel deepening, and bridge modifications. While none of these measures were implemented within the Natural Reach, they appear to have altered Turkey Creek's hydrology such that the stream has become unstable in the Natural Reach. Not only is this threatening nearby infrastructure, but this is also causing an increase in sedimentation impacts to Project features further downstream. This in turn threatens the flood risk management performance of the Project.

The Recommended Plan is designed to address these instability issues through a collection of different measures. While these measures are described in greater detail in Section 2 of the Supplemental EA (SEA), they are summarized below:

- Installation of a riprap revetment along 330 feet of the left streambank shortly upstream of the Walled Channel reach. This measure would place approximately 4,701.2 cubic yards of stone.
- Removal of approximately 2205 cubic yards of sediment and gravel from the channel shortly upstream of the Walled Channel reach.
- Removal of an old pedestrian bridge abutment adjacent to the channel shortly upstream of where gravel and sediment will be removed.
- Installation of longitudinal stone toe protection along 470 feet of the left streambank immediately upstream of the left bank riprap revetment. This measure would place approximately 2,152.6 cubic yards of stone.
- Installation of a riprap revetment along 180 feet of the right streambank shortly upstream of the Walled Channel reach. This measure would place approximately 2,207.8 cubic yards of stone.
- Installation of a 30-foot-long riprap grade control structure approximately 400 feet upstream of the left bank stone toe. This measure would place approximately 430.6 cubic yards of stone.

The Recommended Plan would result in the removal of approximately 1,500 linear feet of riparian vegetation along Turkey Creek in the Natural Reach. Impacts to bottomland hardwood forest in the Natural Reach would be negligible due to construction limits working around this habitat type as much as possible. While this would result in a long-term impact to terrestrial habitats - and terrestrial fauna by extension - these areas will regenerate natural vegetation over time. Thus, this adverse impact is reduced over time. In the short-term, disturbed areas would be reseeded with natural plant species to prevent the spread of invasive plants.

The Recommended Plan would result in a minor long-term impact to the floodplain. Temporary impacts to soils, water quality, air quality, fish/wildlife species, noise, and traffic would be greatest during actual construction activities, but would be minor in nature and would be minimized due to implementation of required mitigation and Best Management Practices (BMPs).

- c. Authority:** Section 404 of the Clean Water Act (33 USC 1344). The feasibility study for the Project is authorized by the Water Resources Development Act of 1999. Construction of measures recommended by this feasibility study was conducted under the authorization of the Consolidated Appropriations Resolution, 2003

3. Review of Compliance (§ 230.10 a-d)

- a.** No practicable alternative to the Recommended Plan would have a less adverse impact on the aquatic ecosystem while providing a suitable level of protection to local infrastructure (e.g., I35) and maintaining the adequate performance of the Project. Additional information on the impacts of various alternatives to waters of the U.S. can be found in Section 3 of the SEA.
- b.** The Recommended Plan does not appear to violate any applicable state water quality standards, nor applicable toxic effluent standard or prohibition under Section 307 of the Clean Water Act. The Recommended Plan is not likely to jeopardize the continued existence of species listed as endangered or threatened under the Endangered Species Act of 1973, as amended, and would have no effect on federally designated critical habitat. Furthermore, the Recommended Plan would not violate the requirements of any Federally designated marine sanctuary.
- c.** The Recommended Plan would not cause or contribute to significant degradation of waters of the U.S. This includes no significant adverse effects on human health, life stages of organisms' dependent on the aquatic ecosystem, ecosystem diversity, productivity and stability, and recreational, aesthetic, and economic values.
- d.** Appropriate and practical steps have been taken which would minimize potential adverse impacts on the aquatic ecosystem.

4. Technical Evaluation Factors (Subparts C-F)

a. Potential Impacts on Physical and Chemical Characteristics of the Aquatic Ecosystem (Subpart C)

- 1) **Substrate:** The Recommended Plan would result in minor short-term impacts to substrate and long-term benefits. In the short-term, the installation of the grade control structure would place stone on top of extant substrate, forcing bottom-dwelling fauna to migrate. However, this stone structure would then act as riffle habitat very similar to riffle habitat already present in the Natural Reach. Thus, any displaced organisms are not anticipated to have difficulty recolonizing this location. This structure would prevent the continued migration of an identified headcut in the streambed, preventing it from disrupting stream bottom habitat along a greater length of Turkey Creek. Because previous KDWP surveys of Turkey Creek have not identified any mussels in the stream, the Corps does not anticipate burial of immobile fauna to any significant degree. Sediment and gravel removal at the downstream end of the Natural Reach is not anticipated to have a significant impact on substrate either, as the gravel bar feature here is only being reduced instead of entirely removed. These impacts are not anticipated to result in significant changes to the relative amounts of substrate types present in the stream. By reducing erosion and sedimentation, the Recommended Plan would prevent the gradual increase of silt substrate that would occur at the expense of coarser substrate types that support different organisms.
- 2) **Suspended particulates/turbidity:** The Recommended Plan would result in minor short-term impacts to suspended particulates and an increase in turbidity during construction from in-channel work and potential runoff. BMPs would be employed to reduce these impacts. No long-term negative impacts are expected. The anticipated long-term impact of the Recommended Plan is a reduction in sedimentation and turbidity in the stream due to stabilization of the channel bed and streambank.
- 3) **Water:** The Recommended Plan would not result in any long-term negative impacts to water quality. The Recommended Plan may result in minor short-term construction related impacts to water quality due to activities taking place in the channel, along the streambank, and in the floodplain more generally. These activities would result in increased suspended particulates and increased turbidity. This has some potential to have secondary impacts on nutrient concentrations, dissolved oxygen, pH, and conductivity.

These impacts would be minimized by using BMPs to minimize the amount of runoff and land/channel disturbance that would occur during construction. The anticipated long-term impact to water quality is beneficial due to reducing sedimentation and turbidity in the stream by stabilizing the channel bed and streambank.

- 4) Current patterns and water circulation:** The revetments and stone toe protection are anticipated to cause an increase in stream velocity along their reach of the stream though velocities would generally decrease upstream and downstream of these structures. These changes are not anticipated to be significant. Hardening the left bank at the site of the revetment and removal of material from the gravel bar on the opposite bank would cause a minor change in the direction of water flow as the channel slightly shifts away from I35 infrastructure. It is not anticipated that this would result in any significant adverse changes to the location, structure, and dynamics of the aquatic community or the rate and extent of the mixing of dissolved and suspended components of the water body.
- 5) Normal water fluctuations:** The proposed plan would cause a minor increase in water surface elevation (WSE) in the Natural Reach and Restored Channel reach. WSE in the Natural Reach would return to levels slightly below what they were following the previous implementation of Project measures. Since that time, WSE in the Natural Reach has been falling due to erosion. WSE in the Restored Channel reach would be slightly raised above original post-implementation levels, though this increase is small enough that significant adverse impacts to the aquatic environment are not expected. By reducing erosion in the Natural Reach, the Recommended Plan would reduce sedimentation in the downstream Walled Channel reach, reducing long-term changes in water fluctuations there.
- 6) Salinity Gradients:** The Recommended Plan would not impact any salinity gradients. The Turkey Creek basin is a freshwater system, and this would not change as a result of the Supplemental Project.

b. Potential Impacts to the Biological Characteristics of the Aquatic Ecosystem (Subpart D)

- 1) Threatened and endangered species:** Based on consultation with the U.S. Fish and Wildlife Service (USFWS), the only Federally listed threatened and endangered species with a potential presence at the Natural Reach is the endangered northern long-eared bat (*Myotis septentrionalis*). There are a small number of large

exfoliating bark trees that would be removed during construction. These trees could be used by the bats during the summer roosting season. However, the trees would only be removed between November 1 and March 31, when the bats have retreated to limestone caves for over wintering, so no significant impacts to the bats are expected. Based on informal Section 7 coordination with USFWS, construction activities may affect, but are not likely to adversely affect the northern long-eared bat. See Appendix G of the SEA for IPaC information and additional USFWS correspondence.

- 2) Fish, crustaceans, mollusks, and other aquatic organisms in the food web:** The Recommended Plan would not result in significant adverse impacts to aquatic organisms. Minor, short-term impacts to the aquatic community may result from an increase in turbidity during construction. Placement of stone in the channel, particularly at the site of the grade control structure, would likely cause aquatic organisms to temporarily migrate. Previous KDWP surveys of Turkey Creek did not identify any mussels and the stream is unlikely to have a significant presence of immobile fauna. The reduction of the gravel bar may cause short-term impacts to aquatic organisms. However, because this feature would not be removed entirely and because other gravel bars would be left in their current condition, the impact to aquatic organisms is not expected to be significant. These surveys also indicate that the fish community in this stream is largely composed of common species that can tolerate disturbances typical of urban environments. The Recommended Plan may affect individual organisms in a small stretch of Turkey Creek but is unlikely to have a significant impact on the overall population of any particular species within the waterbody. Because no significant changes to the instream habitat of Turkey Creek are anticipated, displaced aquatic organisms would be able to recolonize without difficulty. No significant adverse long-term impacts are anticipated. The aquatic community may benefit in the long-term from a stabilized streambed and a reduction in sedimentation.
- 3) Other wildlife:** Wildlife associated with the Natural Reach includes resident and transient mammals, birds, reptiles, and amphibians. These are generally represented by edge and urban adaptive species that can tolerate disturbances typical of an urban setting. There would be minor short-term and long-term impacts to these types of wildlife as a result of removing terrestrial vegetation. Construction boundaries are defined to work around bottomland hardwood forest in the Natural Reach as much as possible. All

disturbed land areas would be seeded with native grasses as part of construction. Noise from construction equipment may also create a short-term negative impact to wildlife. No significant adverse long-term impacts are anticipated.

c. Potential Impacts on Special Aquatic Sites (Subpart E)

- 1) Sanctuaries and Refuges:** No sanctuaries or refuges were identified in or adjacent to the Natural Reach.
- 2) Wetlands:** No wetlands were identified in or adjacent to the Natural Reach area.
- 3) Mud flats:** No mud flats would be impacted by the Recommended Plan.
- 4) Vegetated shallows:** No vegetated shallows would be impacted by the Recommended Plan.
- 5) Coral reefs:** The Natural Reach does not provide the necessary environmental conditions to support corals.
- 6) Riffle and pool complexes:** Riffle and pool complexes are present in the Natural Reach but are currently being impacted by stream instability. A headcut is degrading the streambed and is likely disrupting this habitat complex. Ongoing sedimentation threatens to degrade this habitat further. The Recommended Plan would impact riffles by placing stone in the stream, particularly at the site of the grade control structure. However, the grade control structure would functionally act as riffle habitat after construction. This structure would also prevent the headcut from traveling further upstream and degrading riffle and pool complexes along the way. Not all riffles in the Natural Reach or adjacent sections of Turkey Creek would be directly impacted, which would provide short-term refugia for organisms that depend on this kind of habitat. BMPs would mitigate the rise in sedimentation caused by construction activities. By reducing erosion throughout the Natural Reach, riffles and pools will have a reduced risk of being clogged with sediment. Thus, the Recommended Plan is anticipated to benefit the stable presence of riffle and pool complexes in the Natural Reach in the long-term.

d. Potential Effects on Human Use Characteristics (Subpart F):

- 1) Municipal and private water supplies:** The Recommended Plan would not impact any municipal or private water supplies.

- 2) **Recreational and commercial fisheries:** The Recommended Plan would not significantly affect the suitability of any recreational or commercial fisheries. The Recommended Plan would result in no more than minor impacts to fish habitat.
- 3) **Water-related recreation:** The Recommended Plan would not significantly impair or destroy any resources which support recreation activities.
- 4) **Aesthetics:** The Recommended Plan may result in minor impacts to the aesthetics of the area as a result of vegetation clearing and ground disturbing construction activities. However, because the Natural Reach is generally inaccessible, much of these temporary aesthetic impacts would not be observable to the public.
- 5) **Parks, national and historic monuments, national seashores, wilderness areas, research sites, and similar preserves:** The Boulevard Drive-In Theater, located adjacent to the eastern end of the Natural Reach, is potentially eligible for the National Register of Historic Places. However, the State Historic Preservation Office has concurred that the Supplemental Project would have no effect to historic properties.

5. EVALUATION OF DREDGED OR FILL MATERIAL (Subpart G)

- a. **General evaluation of dredged or fill material:** Stone used as fill material would be locally quarried, thus making it similar to stone already present in the stream. The stone would be free from cracks, blast fractures, bedding, seams, and other defects that would tend to increase its deterioration from natural causes. The stone would also be free from all foreign matter; any foreign material adhering to or combined with the stone as a result of stockpiling would be removed prior to placement. Soils that may be disturbed by excavation activities are largely fill, lean clays containing traces of gravel, sands, broken glass, and cinder block or brick fragments. The alluvial material around the bridge abutment to be removed and the gravel bar to be reduced appears to be comprised of various clays and clayey gravel.
- b. **Chemical, biological, and physical evaluation and testing:** The Supplemental Project would utilize clean, quarried stone. Visual examinations would be used to confirm the absence of fractures and other defects, as well as any foreign material adhering to or combined with the stone. Site inspections and previous investigations of soils at the Natural Reach did not identify significant concerns. A recent review of federal and state Hazardous, Toxic, or Radioactive Waste (HTRW) databases did not

identify incidents within the Natural Reach. If any HTRW material is identified during construction, all activities would cease until the proper Phase II assessments could be conducted.

6. DISPOSAL SITE DELINEATION (§230.11 f)

Locations for fill and removal of the bridge abutment and gravel are as described and depicted in Section 2 of the SEA. As stated in the SEA, removed material would be disposed of outside of the channel and 100-year floodplain, most likely in a landfill. Because the Recommended Plan includes various measures throughout the Natural Reach, there would be multiple mixing zones. The amount of fill that would be used has been determined to be the minimum amount necessary to provide the desired level of protection to the Project. BMPs would be utilized to mitigate inadvertent discharge of soil into Turkey Creek during and after construction activities. Because of the overall small scale of the measures within the Recommended Plan, the clean nature of the fill and dredged material, the implementation of BMPs, and the absence of particular environmental factors making the site's aquatic community especially sensitive to these disturbances, these mixing zones would not be anticipated to experience significant environmental impacts.

7. ACTIONS TO MINIMIZE ADVERSE EFFECTS (SUBPART H)

The construction contractor would be required to obtain a Section 402 NPDES stormwater permit from Kansas Department of Health and Environment. As part of the NPDES permit, BMPs would be required to minimize the incidental fallback of material into the waterway and to minimize the fuel, petroleum products, or other deleterious material from the waterway. Such measures could include the use of erosion control fences; storing equipment, solid waste, and petroleum products above the ordinary high-water mark and away from areas prone to runoff; and requiring that all equipment be clean and free of leaks. To prevent fill from reaching water sources by wind or runoff, fill would be covered, stabilized or mulched, and silt fences would be used as required.

8. FACTUAL DETERMINATIONS (§230.11)

A review of the information in items 4 through 7 of this report indicates that there is minimal potential for long-term environmental effects with inadvertent discharges of runoff from the construction area to Turkey Creek. Additionally, there are not expected to be any cumulative or long-term, secondary impacts as a result of these actions.

9. FINDINGS (§230.12)

The Recommended Plan has been evaluated and determined in compliance with Clean Water Act Section 404(b)(1) guidelines, with the inclusion of appropriate and practical conditions to minimize pollution and adverse effects on the aquatic ecosystem.

Prepared by: _____ Date _____
Mr. Max Headlee
Environmental Resources Specialist
Planning Branch

Reviewed by: _____ Date _____
Mr. Michael Snyder
Chief, Environmental Resources Section
Planning Branch

Approved by: _____ Date _____
Travis J. Rayfield
Colonel, Corps of Engineers
District Commander

APPENDIX B

Kansas Stream Mitigation Method

Project Name: Lower Turkey Creek Natural Reach

Date: 1-May-23

Adverse Impact Factors for Riverine Systems Worksheet										
Factor	Impact 1	Impact 2	Impact 3	Impact 4	Impact 5	Impact 6	Impact 7	Impact 8	Impact 9	Impact 10
Stream Type Impacted	0.8	0.8	0.8							
Stream Status	0.4	0.4	0.4							
Existing Condition Value	0.1	0.1	0.1							
<i>Formula total</i>	0.08	0.08	0.08	0	0	0	0	0	0	0
Duration	0.3	0.3	0.3							
Activity	1.5	0.5	1.5							
Cumulative impact	0.066	0.186	0.009	0	0	0	0	0	0	0
Sum of Factors = M	3.146	2.266	3.089	0	0	0	0	0	0	0
Linear Feet of Stream Impacted = LF	220	620	30							
M x LF	692.12	1404.92	92.67	0	0	0	0	0	0	0

Total Mitigation Credits Required = 2189.71

Adverse Impact Factors Table							
Stream Type	Ephemeral/Intermittent w/o Pools 0.4			Intermittent w/ Pools 0.6			Perennial 0.8
Stream Status	Tertiary 0.1			Secondary 0.4			Primary 0.8
Existing Condition	Functionally Impaired Stream Type x 0.1			Moderately Functional Stream Type x 0.8			Highly Functional Stream Type x 5.0
Duration	Temporary (<1 yr.) 0.05			Short Term (1-2 yr.) 0.1			Permanent (>2 yr.) 0.3
Impact Activity	Below Grade Culvert 0.3	Armor 0.5	Diversion/ Weir 0.75	Morphologic 1.5	Impound 2	Pipe 2.2	Fill 2.5
Cumulative Impact	0.0003 x total linear feet of stream impacted per reach						

Project Name:

Lower Turkey Creek Natural Reach

Date: 1-May-23

In-Stream Work/Channel Restoration or Enhancement and Relocation Worksheet										
Factors	Benefit 1	Benefit 2	Benefit 3	Benefit 4	Benefit 5	Benefit 6	Benefit 7	Benefit 8	Benefit 9	Benefit 10
Stream Type	0.8	0.8								
Priority Area	0.2	0.2								
Existing Condition	0.4	0.4								
Net Benefit	1	1								
Control/Site Protection	0.4	0.4								
Mitigation construction Timing	0	0								
Sum Factors (M)	2.8	2.8	0	0	0	0	0	0	0	0
Stream length in Reach (LF)	840	30								
Credits (C) = M x LF	2352	84	0	0	0	0	0	0	0	0
Site Factor (SF) pg 19	1	1								
Barrier Removal Credits (A) (from worksheet below)										
Total Credits Generated (C x SF) + A =	2352	84	0	0	0	0	0	0	0	0

Total Channel Restoration/Relocation Credits Generated =

2436

In-Stream Work/ Channel Restoration or Enhancement and Relocation Table						
Stream Type	Ephemeral/Intermittent w/o Pools 0.2	Intermittent w/ Pools 0.4	Perennial Stream Avg. Width at OHWM			
			<15'	15'-30'	30'-50'	>50'
Priority Area	Tertiary 0.05	Secondary 0.2	Primary 0.4			
Existing Condition	Not Applicable 0	Functionally Impaired 0.4	Moderately Functional 0.05			
Net Benefit	Minimal 1.0	Moderate 2.0	Substantial 3.5			
Control/Site Protection	Corps approved site protection without third party grantee 0.1		Corps approved site protection recorded with third party grantee, or transfer of title to a conservancy 0.4			
Mitigation Construction Timing	Schedule 1 0.3	Schedule 2 0.1	Schedule 3 0			

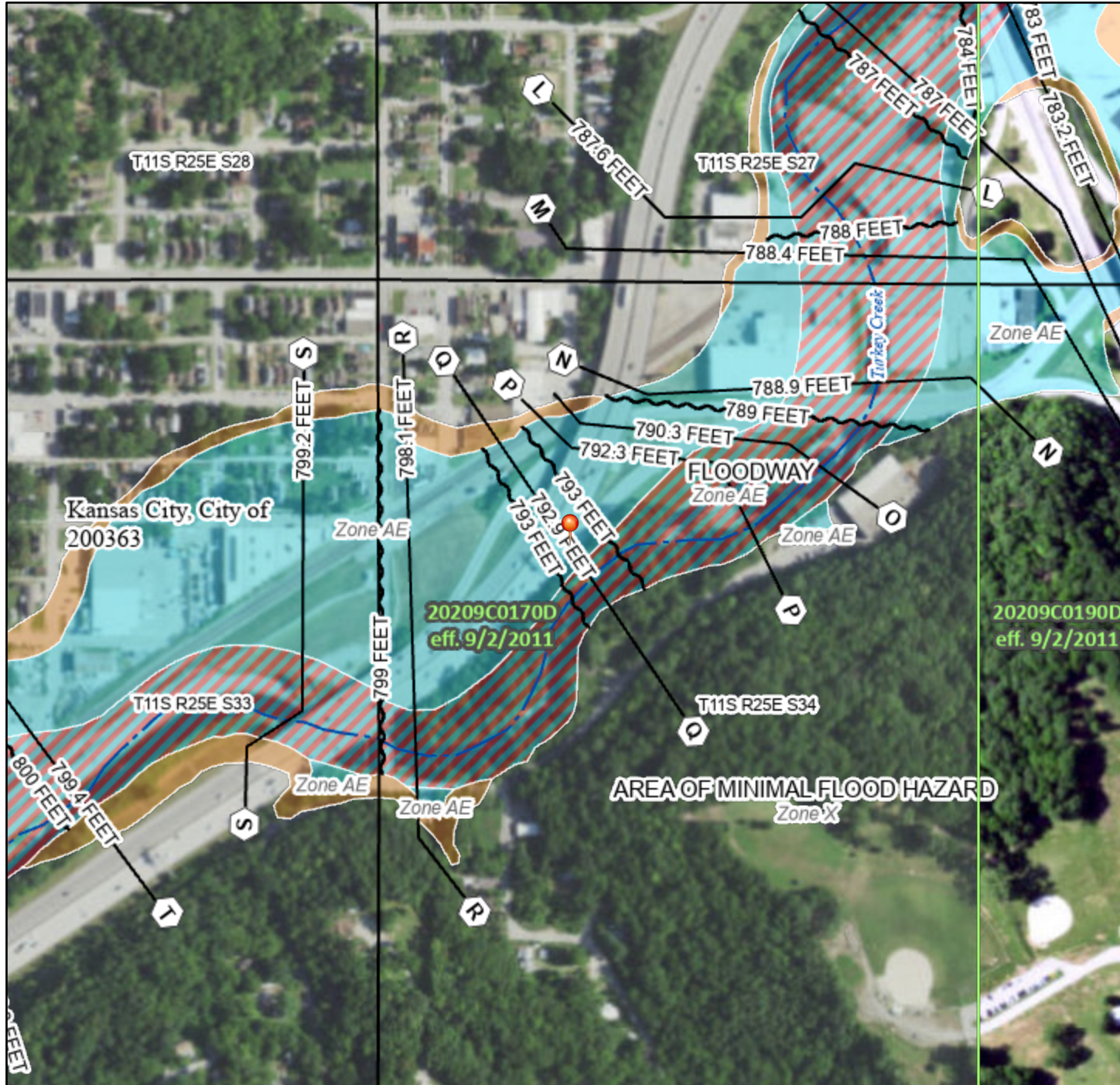
APPENDIX C

FEMA Flood Hazard Map and 8-Step Process for EO 11988: Floodplain Management

National Flood Hazard Layer FIRMMette



94°38'2"W 39°3'38"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D

OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall

OTHER FEATURES		20.2 Cross Sections with 1% Annual Chance
		17.5 Water Surface Elevation
		Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
OTHER FEATURES		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature

MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.



This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on **2/2/2023 at 1:35 PM** and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

8-Step Process for EO 11988: Floodplain Management

Turkey Creek Flood Damage Reduction Project – Natural Reach

- Water Resources Development Act (WRDA) of 1999
- Decision Process for EO 11988 as Provided by 24 CFR §55.20

Step 1: Determine whether the action is located in a 100-year floodplain (or a 500-year floodplain for critical actions).

This action is located in the 100-year floodplain. The National Flood Hazard Layer FIRMette included in this appendix displays the 100-year floodplain in the study area. The Recommended Plan is the installation of riprap along the left and right banks of Turkey Creek, a longitudinal stone toe along the left bank, a riprap grade control structure in the channel, and the removal of gravel and an old bridge abutment from the channel. Therefore, E.O. 11988 applies. An evaluation of direct and indirect impacts associated with construction, occupancy, and modification of the flood plain is required.

The Recommended Plan is comprised of six measures:

1. Installation of a riprap revetment along 330 feet of the left streambank shortly upstream of the Walled Channel reach.
2. Removal of approximately 2205 cubic yards of sediment and gravel from the channel shortly upstream of the Walled Channel reach.
3. Removal of an old pedestrian bridge abutment from the channel shortly upstream of where gravel and sediment will be removed.
4. Installation of longitudinal stone toe protection along 470 feet of the left streambank immediately upstream of the left bank riprap revetment.
5. Installation of a riprap revetment along 180 feet of the right streambank shortly upstream of the Walled Channel reach.
6. Installation of a 30-foot-long riprap grade control structure approximately 400 feet upstream of the left bank stone toe.

Disturbed areas will also be reseeded with native plant species in order to prevent the spread of invasive species. Since the project activities are necessarily concentrated along the streambank and in the channel, this analysis considers impacts to the floodway.

Step 2: Notify the public for early review of the proposal and involve the affected and interested public in the decision making process.

USACE sent out letters to various federal and Kansas state agencies in March 2023 to notify them of the Supplemental Environmental Assessment (SEA) and to solicit them for any initial comments. These comments are summarized in Section 4 of the SEA. No substantial concerns

were raised. The SEA and Finding of No Significant Impact (FONSI) will be made available for public review and comment for a period of 30 days beginning in June 2023.

Step 3: Identify and evaluate practicable alternatives.

The objective of this study is to address the substantial bed lowering, bank erosion, and channel widening occurring in the Natural Reach of Turkey Creek in an economically justified, environmentally sound, and technically feasible manner. These issues, in addition to erosion further upstream in the watershed, are causing sediment to accumulate downstream in the Walled Channel reach. This is degrading the performance of the Turkey Creek Flood Damage Reduction Project.

The planning constraints identified in this study are as follows:

- The alternative chosen must protect I35 and its associated infrastructure.
- The alternative chosen must minimize impacts to the bottomland hardwood forest habitat present in the Natural Reach.

The study evaluated a variety of measures for their effectiveness at addressing the various stream instability issues at the Natural Reach while meeting planning constraints. These measures were used to develop five action alternatives which were carried forward for environmental effect analysis, one of which is the Recommended Plan. The No Action Alternative was also carried forward for environmental effect analysis.

A. Locate the Project Within the Floodplain

The Recommended Plan is comprised of six measures. First, a riprap revetment would be installed on the left descending bank shortly upstream of the Walled Channel reach. This area is experiencing the most erosion in the Natural Reach and is crucial for supporting the I35-Southwest Boulevard offramp. The streambank would be sloped at 3H:1V and the riprap revetment would be placed up to an elevation 789 feet, which is the approximate top of bank. The revetment would have a thickness of seven feet at the base to provide extra stone for launching, and a 3.5-foot thickness the rest of the way up the slope. The additional stone at the base will make the feature more resilient to toe scour, which is one of the most common methods of riprap failure. A 7-foot-thick revetment key would be placed at the upstream end of the revetment. The riprap would be sized to withstand a 1% Annual Exceedance Probability (AEP) discharge, which is approximately 24,300 cubic feet per second (cfs). The revetment would be embedded 0.5 feet into the channel to prevent the stone from sliding on the channel bed. This measure would install approximately 4,701.2 cubic yards of stone.

Second, this alternative would remove approximately 2205 cubic yards of sediment and gravel from the right bank gravel bar opposite the left bank riprap revetment to create a smoother transition into the Walled Channel.

Third, an abutment from a previously removed pedestrian bridge would also be removed to eliminate it as an obstruction in the channel.

Fourth, a longitudinal stone toe would be installed along the left descending bank upstream of the riprap revetment. The stone toe would have a riverward side slope of 2H:1V and would be embedded into the channel by 0.5 feet to prevent stone from sliding on the channel bed. Because boring logs and field reconnaissance indicate that the channel bed in this reach consists mostly of bedrock, a thickness of 3.5 feet is proposed for the stone toe. This thickness would be sufficient to resist toe scour without requiring excavation into the I35 embankment or extending the stone toe too far into the channel, which would raise water surface elevation (WSE) and stream velocity unnecessarily. Keys would be placed approximately every 75 feet along the stone toe and would have a total height of 15 feet from the bottom of the stone toe to the top of the key. Keys would be placed perpendicularly to the stone toe except for the end keys, which would be angled at 110-degrees. The middle keys would have a 3.5-foot thickness, 6-foot width, and would be placed on the existing grade. The end keys would be embedded into the streambank and have a 6-foot thickness. Approximately 2,152.6 cubic yards of stone would be used to construct the stone toe and keys.

Fifth, a riprap revetment would be installed along the right descending bank shortly upstream of the Walled Channel reach to address erosion concerns on the right bank of Turkey Creek. Because modeled velocities on this side of the bank of much lower than on the left, the riprap revetment here would have a slightly lower top elevation (786 feet) and a steeper slope of 2H:1V when compared to the left bank revetment. The right bank revetment would utilize a revetment key like the left bank revetment, use the same size of riprap, and install riprap at the same thicknesses. This right bank stabilization measure would utilize approximately 2,207.8 cubic yards of stone.

Sixth, a riprap grade control structure would be installed upstream of the other proposed features to address bed degradation in the channel. This grade control structure would extend across the full width of the channel and have a 30-foot width parallel to the flow. The grade control structure would be five feet thick and constructed with riprap the same size used in the riprap revetments. Approximately 430.6 cubic yards of stone would be used to construct this grade control structure.

In addition, the Recommended Plan would reseed disturbed areas with native plant species to stabilize soils and prevent the spread of invasive species. These areas would be allowed to naturally revegetate over the long-term.

B. Locate the Project Outside of the Floodplain

No alternatives located outside of the floodplain were considered as part of the final array. During preliminary analysis, alternatives which did not meet the goals of the project, were not cost effective, or involved HTRW were eliminated. Because the instability issues affecting the

stream are occurring in and along the stream itself, any alternative that stabilized the stream necessarily involved work in the floodplain. No alternatives were identified that could meet the purpose and need of the study without working in the floodplain.

C. No Action or Alternative Actions that Serve the Same Purpose

The No Action Alternative was considered and rejected because without any action, the ongoing degradation of the channel and erosion of the streambank would continue unabated. These instability issues are causing sediment to accumulate in the Walled Channel reach downstream of the Natural Reach. This material is reducing channel capacity and likely raising WSE, thus making the area more susceptible to flood damages. In addition, streambank erosion is threatening to damage I35 infrastructure, which is locally and regionally important for transportation.

Step 4: Identify Potential Direct and Indirect Impacts of Associated with Floodplain Development.

USACE conducted hydraulic modeling to determine the Recommended Plan's anticipated impact on WSE. This modeling indicates that WSE would be increased in the Natural Reach and the upstream Restored Channel reach. However, because WSE in the Natural Reach has been lowering over time due to erosion, WSE in the Natural Reach after the implementation of the Recommended Plan is anticipated to still be below WSE after the previous implementation of other Turkey Creek Flood Damage Reduction Project measures. Thus, the flood impact in the Natural Reach is minor. WSE in the Restored Channel reach is anticipated to increase slightly beyond WSE post-implementation of other Turkey Creek Flood Damage Reduction Project measures. However, due to the previously constructed levee in the Restored Channel reach, this increase would not add any structures to the 0.01 AEP floodplain. Because the Recommended Plan would reduce the accumulation of sediment in the Walled Channel Reach, this alternative would reduce the gradual rising of WSE there and would therefore have a beneficial impact in that part of the stream.

The Recommended Plan would not address all stream instability issues in the Natural Reach. In particular, part of the right streambank upstream of the right bank revetment may still experience erosion after the implementation of the Recommended Plan. Because a local road (Seminary Street) is located adjacent to this streambank, additional streambank stabilization projects may be indirectly caused by the Recommended Plan. USACE anticipates that stabilization methods similar to the Recommended Plan would be utilized here and would therefore have similar impacts to the floodplain. WSE may be raised in the Natural Reach and Restored Channel, but the small scale of work necessary to stabilize the streambank here means this impact is unlikely to be significant. Further reduction of erosion in the streambank would result in less sediment accumulating downstream in the Walled Channel reach, likely reducing a gradual increase in WSE there.

Other developments in the floodplain as an indirect consequence of the Recommended Plan are not anticipated. The area around the Natural Reach is already developed for urban land uses. USACE anticipates that the few small areas of undeveloped land that remain in the floodplain would remain in this condition, as these areas are not well suited for development and would not become so as a consequence of the Recommended Plan.

Step 5: Where practicable, design or modify the proposed action to minimize the potential adverse impacts to lives, property, and natural values within the flood plain and to restore and preserve the values of the flood plain.

The Recommended Plan removes approximately 2,205 cubic yards of gravel and sediment as well as an old pedestrian bridge abutment from the flood hazard area. These measures help to reduce the increase in WSE, though the Recommended Plan would still result in a net increase of fill volume in the flood hazard area. However, the Recommended Plan would substantially reduce the amount of sediment passing downstream into the Walled Channel reach. This would reduce the sediment accumulating there and, by extension, reduce the gradual rising of WSE downstream. There is a greater concentration of infrastructure in the flood hazard area around the Walled Channel reach than there is around the Natural Reach or Restored Channel. As noted earlier, the WSE raise in the Natural Reach is more than compensated by the loss of material that has occurred since previous flood control measures were implemented and the WSE raise in the Restored Channel is contained within the leveed area. Thus, the Recommended Plan would help minimize adverse flood impacts to infrastructure along the Walled Channel reach while only incurring minor, inconsequential flooding impacts upstream of this area.

Step 6: Reevaluate the Alternatives

Although the Recommended Plan is in a floodplain, the project has been designed in order to minimize effects on flood plain values.

The No Action Alternative is not preferred because it will result in the unabated continuation of streambank erosion, channel widening, and streambed degradation which are all contributing to downstream sedimentation. The long-term impact of this decision would be increased flood damages as WSE in the Walled Channel reach gradually rises.

Step 7: Determination of No Practicable Alternative

It is our determination that there is no practicable alternative for locating the project out of the flood zone. This is because the ongoing stability issues are occurring in and along the channel itself. Because these stability issues are occurring within the 100-year floodplain, stabilization activities will also need to occur in the 100-year floodplain. The Recommended Plan is not expected to have adverse impacts on human health, public property, and floodplain values.

Step 8: Implement the Proposed Action

USACE will assure that this plan, as modified and described above, is executed and necessary language will be included in all agreements with participating parties. USACE will also take an active role in monitoring the construction process to ensure no unnecessary impacts occur nor unnecessary risks are taken.

APPENDIX D

Greenhouse Gas Emissions Summary

Action Alternative 1.

Equipment	Diesel Used (gallons)	Gasoline Used or Equivalent of Gasoline Used (gallons)	Carbon Dioxide Equivalent (lbs)
EP H25CA022 HYDRAULIC EXCAVATOR, CRAWLER, 49,600 LBS, 1.56 CY BUCKET, 22' MAX DIGGING DEPTH	2991.3	3426.5	67,134
EP L35ME001 LOADER, FRONT END, SKID STEER, TRACKED, 10.5 CF, 62" WIDE BUCKET	9.2	10.5	206
EP T15JD009 TRACTOR, CRAWLER (DOZER), 165 HP, HYDROSTATIC, LOW GROUND PRESSURE, W/4.84 CY POWER ANGLE TILT (PAT) BLADE (ADD ATTACHMENTS)	1789.3	2049.6	40,157
EP T50XX017 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	119.4	136.8	2,680
EP T50XX020 TRUCK, HIGHWAY, CREW, 3/4 TON PICKUP 4X4	13.3	15.2	298
EP T55JD001 TRUCK, OFF-HIGHWAY, ARTICULATED FRAME, 19.6 CY, 26.7 TON, 6X6, REAR DUMP	1533.9	1757	34,424
GEN C75Z2080 CRANE, HYDRAULIC, SELF-PROPELLED, YARD, 10.5 TON (9.5 MT), 32' (9.8 M) BOOM, 4X4	8.7	10	196
GEN C80Z2260 CRANES, HYDRAULIC, TRUCK MTD, BOOM TRUCK, 23.5T (21.3MT), 102' (31.1M) BOOM, 6X2	66.7	76.4	1,497
GEN L15Z3880 LANDSCAPING EQUIPMENT, 3,000 GAL (11,356 L), HYDROSEEDER, TRUCK MTD (ADD 56 KGVW (25 MT) TRUCK)	44.5	51	999
GEN L50Z4640 LOADER / BACKHOE, WHEEL, 1.0 CY (0.76 M3) FRONT END BUCKET, 24" (61 CM) DIP, 6.2 CF (0.18 M3), 14.5' (4.4 M) DIGGING DEPTH, 4X2	98.7	113.1	2,216
GEN T50Z7320 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	N/A	24.5	480
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	224.3	256.9	5,033
GEN T50Z7700 DUMP TRUCK, HIGHWAY, 32 KGVW (14.5 MT), 2 AXLE, 4X2 WITH REAR 10 - 13 CY (7.6 - 10.0 M3) DUMP BODY	824.9	944.9	18,513
MAP B20MQ005 BRUSH CHIPPER, LOG CHIPPER, 22" CAPACITY, DISC TYPE, TRAILER MTD	154.5	177	3,468
MAP C05S7004 CHAIN SAW, 59" GUIDE BAR	N/A	8.3	163
Total	7878.7	9057.7	177,464

Action Alternative 2.

Equipment	Diesel Used (gallons)	Gasoline Used or Equivalent of Gasoline Used (gallons)	Carbon Dioxide Equivalent (lbs)
EP H25CA022 HYDRAULIC EXCAVATOR, CRAWLER, 49,600 LBS, 1.56 CY BUCKET, 22' MAX DIGGING DEPTH	4466.1	5115.8	100,231
EP L35ME001 LOADER, FRONT END, SKID STEER, TRACKED, 10.5 CF, 62" WIDE BUCKET	18.3	21	411
EP T15JD009 TRACTOR, CRAWLER (DOZER), 165 HP, HYDROSTATIC, LOW GROUND PRESSURE, W/4.84 CY POWER ANGLE TILT (PAT) BLADE (ADD ATTACHMENTS)	2589.7	2966.4	58,119
EP T50XX017 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	185.8	212.8	4,169
EP T50XX020 TRUCK, HIGHWAY, CREW, 3/4 TON PICKUP 4X4	26.5	30.4	596
EP T55JD001 TRUCK, OFF-HIGHWAY, ARTICULATED FRAME, 19.6 CY, 26.7 TON, 6X6, REAR DUMP	2409.6	2760.1	54,077
GEN C75Z2080 CRANE, HYDRAULIC, SELF-PROPELLED, YARD, 10.5 TON (9.5 MT), 32' (9.8 M) BOOM, 4X4	17.4	19.9	390
GEN C80Z2260 CRANES, HYDRAULIC, TRUCK MTD, BOOM TRUCK, 23.5T (21.3MT), 102' (31.1M) BOOM, 6X2	66.7	76.4	1,497
GEN L15Z3880 LANDSCAPING EQUIPMENT, 3,000 GAL (11,356 L), HYDROSEEDER, TRUCK MTD (ADD 56 KGVW (25 MT) TRUCK)	89	101.9	1,996
GEN L50Z4640 LOADER / BACKHOE, WHEEL, 1.0 CY (0.76 M3) FRONT END BUCKET, 24" (61 CM) DIP, 6.2 CF (0.18 M3), 14.5' (4.4 M) DIGGING DEPTH, 4X2	98.7	113.1	2,216
GEN T50Z7320 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	N/A	24.5	480
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	328.6	376.4	7,375
GEN T50Z7700 DUMP TRUCK, HIGHWAY, 32 KGVW (14.5 MT), 2 AXLE, 4X2 WITH REAR 10 - 13 CY (7.6 - 10.0 M3) DUMP BODY	1563.9	1791.4	35,098
MAP B20MQ005 BRUSH CHIPPER, LOG CHIPPER, 22" CAPACITY, DISC TYPE, TRAILER MTD	206	236	4,624
MAP C05S7004 CHAIN SAW, 59" GUIDE BAR	N/A	11.2	219
Total	12066.3	13857.3	271,498

Action Alternative 3

Equipment	Diesel Used (gallons)	Gasoline Used or Equivalent of Gasoline Used (gallons)	Carbon Dioxide Equivalent (lbs)
EP H25CA022 HYDRAULIC EXCAVATOR, CRAWLER, 49,600 LBS, 1.56 CY BUCKET, 22' MAX DIGGING DEPTH	8252.7	9453.3	185,214
EP L35ME001 LOADER, FRONT END, SKID STEER, TRACKED, 10.5 CF, 62" WIDE BUCKET	27.5	31.5	617
EP T15JD009 TRACTOR, CRAWLER (DOZER), 165 HP, HYDROSTATIC, LOW GROUND PRESSURE, W/4.84 CY POWER ANGLE TILT (PAT) BLADE (ADD ATTACHMENTS)	4615	5286.4	103,574
EP T50XX017 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	252.1	288.8	5,658
EP T50XX020 TRUCK, HIGHWAY, CREW, 3/4 TON PICKUP 4X4	39.8	45.6	893
EP T55JD001 TRUCK, OFF-HIGHWAY, ARTICULATED FRAME, 19.6 CY, 26.7 TON, 6X6, REAR DUMP	4355.6	4989.2	97,751
GEN C75Z2080 CRANE, HYDRAULIC, SELF-PROPELLED, YARD, 10.5 TON (9.5 MT), 32' (9.8 M) BOOM, 4X4	17.4	19.9	390
GEN C80Z2260 CRANES, HYDRAULIC, TRUCK MTD, BOOM TRUCK, 23.5T (21.3MT), 102' (31.1M) BOOM, 6X2	66.7	76.4	1,497
GEN L15Z3880 LANDSCAPING EQUIPMENT, 3,000 GAL (11,356 L), HYDROSEEDER, TRUCK MTD (ADD 56 KGVW (25 MT) TRUCK)	133.5	152.9	2,996
GEN L50Z4640 LOADER / BACKHOE, WHEEL, 1.0 CY (0.76 M3) FRONT END BUCKET, 24" (61 CM) DIP, 6.2 CF (0.18 M3), 14.5' (4.4 M) DIGGING DEPTH, 4X2	98.7	113.1	2,216
GEN T50Z7320 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	N/A	39.8	780
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	432.9	495.9	9,716
GEN T50Z7700 DUMP TRUCK, HIGHWAY, 32 KGVW (14.5 MT), 2 AXLE, 4X2 WITH REAR 10 - 13 CY (7.6 - 10.0 M3) DUMP BODY	1865.4	2136.8	41,865
MAP B20MQ005 BRUSH CHIPPER, LOG CHIPPER, 22" CAPACITY, DISC TYPE, TRAILER MTD	257.6	295.1	5,782
MAP C05S7004 CHAIN SAW, 59" GUIDE BAR	N/A	14.1	276
Total	20414.9	23438.8	459,225

Action Alternative 4 (Recommended Plan).

Equipment	Diesel Used (gallons)	Gasoline Used or Equivalent of Gasoline Used (gallons)	Carbon Dioxide Equivalent (lbs)
EP H25CA022 HYDRAULIC EXCAVATOR, CRAWLER, 49,600 LBS, 1.56 CY BUCKET, 22' MAX DIGGING DEPTH	8548	9791.5	191,840
EP L35ME001 LOADER, FRONT END, SKID STEER, TRACKED, 10.5 CF, 62" WIDE BUCKET	36.6	41.9	821
EP T15JD009 TRACTOR, CRAWLER (DOZER), 165 HP, HYDROSTATIC, LOW GROUND PRESSURE, W/4.84 CY POWER ANGLE TILT (PAT) BLADE (ADD ATTACHMENTS)	4786.4	5482.7	107,420
EP T50XX017 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	318.5	364.8	7,147
EP T50XX020 TRUCK, HIGHWAY, CREW, 3/4 TON PICKUP 4X4	53.1	60.8	1,191
EP T55JD001 TRUCK, OFF-HIGHWAY, ARTICULATED FRAME, 19.6 CY, 26.7 TON, 6X6, REAR DUMP	4510	5166.1	101,217
GEN C75Z2080 CRANE, HYDRAULIC, SELF-PROPELLED, YARD, 10.5 TON (9.5 MT), 32' (9.8 M) BOOM, 4X4	17.4	19.9	390
GEN C80Z2260 CRANES, HYDRAULIC, TRUCK MTD, BOOM TRUCK, 23.5T (21.3MT), 102' (31.1M) BOOM, 6X2	66.7	76.4	1,497
GEN L15Z3880 LANDSCAPING EQUIPMENT, 3,000 GAL (11,356 L), HYDROSEEDER, TRUCK MTD (ADD 56 KGVW (25 MT) TRUCK)	177.9	203.8	3,993
GEN L50Z4640 LOADER / BACKHOE, WHEEL, 1.0 CY (0.76 M3) FRONT END BUCKET, 24" (61 CM) DIP, 6.2 CF (0.18 M3), 14.5' (4.4 M) DIGGING DEPTH, 4X2	98.7	113.1	2,216
GEN T50Z7320 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	N/A	39.8	780
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	537.2	615.3	12,055
GEN T50Z7700 DUMP TRUCK, HIGHWAY, 32 KGVW (14.5 MT), 2 AXLE, 4X2 WITH REAR 10 - 13 CY (7.6 - 10.0 M3) DUMP BODY	1962.6	2248.1	44,046
MAP B20MQ005 BRUSH CHIPPER, LOG CHIPPER, 22" CAPACITY, DISC TYPE, TRAILER MTD	270.5	309.9	6,072
MAP C05S7004 CHAIN SAW, 59" GUIDE BAR	N/A	14.8	290
Total	21383.6	24548.9	480,975

Action Alternative 5.

Equipment	Diesel Used (gallons)	Gasoline Used or Equivalent of Gasoline Used (gallons)	Carbon Dioxide Equivalent (lbs)
EP H25CA022 HYDRAULIC EXCAVATOR, CRAWLER, 49,600 LBS, 1.56 CY BUCKET, 22' MAX DIGGING DEPTH	9848.4	11281.1	221,025
EP L35ME001 LOADER, FRONT END, SKID STEER, TRACKED, 10.5 CF, 62" WIDE BUCKET	64.1	73.4	1,438
EP T15JD009 TRACTOR, CRAWLER (DOZER), 165 HP, HYDROSTATIC, LOW GROUND PRESSURE, W/4.84 CY POWER ANGLE TILT (PAT) BLADE (ADD ATTACHMENTS)	5463.4	6258.2	122,614
EP T50XX017 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	517.6	592.9	11,616
EP T50XX020 TRUCK, HIGHWAY, CREW, 3/4 TON PICKUP 4X4	92.9	106.4	2,085
EP T55JD001 TRUCK, OFF-HIGHWAY, ARTICULATED FRAME, 19.6 CY, 26.7 TON, 6X6, REAR DUMP	5268.3	6034.7	118,235
GEN C75Z2080 CRANE, HYDRAULIC, SELF-PROPELLED, YARD, 10.5 TON (9.5 MT), 32' (9.8 M) BOOM, 4X4	26.1	29.9	586
GEN C80Z2260 CRANES, HYDRAULIC, TRUCK MTD, BOOM TRUCK, 23.5T (21.3MT), 102' (31.1M) BOOM, 6X2	66.7	76.4	1,497
GEN L15Z3880 LANDSCAPING EQUIPMENT, 3,000 GAL (11,356 L), HYDROSEEDER, TRUCK MTD (ADD 56 KGVW (25 MT) TRUCK)	311.4	356.7	6,989
GEN L50Z4640 LOADER / BACKHOE, WHEEL, 1.0 CY (0.76 M3) FRONT END BUCKET, 24" (61 CM) DIP, 6.2 CF (0.18 M3), 14.5' (4.4 M) DIGGING DEPTH, 4X2	98.7	113.1	2,216
GEN T50Z7320 TRUCK, HIGHWAY, CONVENTIONAL, 3/4 TON PICKUP, 4X4	N/A	39.8	780
GEN T50Z7420 TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	850.1	973.8	19,079
GEN T50Z7700 DUMP TRUCK, HIGHWAY, 32 KGVW (14.5 MT), 2 AXLE, 4X2 WITH REAR 10 - 13 CY (7.6 - 10.0 M3) DUMP BODY	2477.8	2838.3	55,609
MAP B20MQ005 BRUSH CHIPPER, LOG CHIPPER, 22" CAPACITY, DISC TYPE, TRAILER MTD	373.4	427.7	8,380
MAP C05S7004 CHAIN SAW, 59" GUIDE BAR	N/A	20.3	398
Total	25458.9	29222.7	572,547

APPENDIX E
HTRW Summary

Table E1. KDHE Identified Sites List facilities within one mile of the Natural Reach area. EUC = Environmental Use Control.

Project Code	Site Status	Site Name	Program Name	Contaminants	EUC in Place?	Most Recent Action
C404673326	Active	Former Betty Brite Coin Op	BER - Dry Cleaner Remediation	Not listed	No	Remedial Design Plan - Jun 2021
C410570999	Resolved	Hinckley Springs Water Company	BER - Voluntary Cleanup	Refined Petroleum, VOC	No	NFA Letter - Nov 2006
C410571654	Resolved	Southwest Blvd Drum Site	BER - Superfund	Not listed	No	Resolved - Dec 1995
C410571655	Resolved	Southwest Plating Company	BER - Superfund	Heavy Metal	No	Resolved - Sep 1999
C410571710	Resolved	Roe Lane Tank	BER - Superfund	Chrome plating waste, tar	No	Resolved - Dec 1987
C410572146	Resolved	1136 Southwest Blvd	BER - Site Assessment	Not listed	No	NFRAP - Dec 2006
C410572413	Resolved	South Ferree and Lake Ave	BER - Site Assessment	VOC	No	NFRAP - Mar 2009
C410572640	Resolved	I35/635 Business Center Upgradient	BER - Site Assessment	Not listed	No	Resolved - Jun 2012
C410572943	Resolved	Radium Petroleum Co. (Former)	BER - Orphan Sites	Not listed	No	Transfer w/n bureau - Jan 2018
C410572947	Active	2555 South Ferree	BER - Orphan Sites	Heavy Metal, PCB, Refined Petroleum	Yes	EUC - Jul 2018
C410573553	Resolved	PCE - Southwest Blvd	BER - Site Assessment	Not listed	No	Resolved - Feb 2021
C410573726	Active	Rode Cleaners - 4024 Rainbow Blvd	BER - Dry Cleaner Remediation	Refined Petroleum	No	Phase II Assessment - Aug 2020

Table E2. CERCLIS facilities within 0.5 miles of the Natural Reach area. NFRAP = No Further Remedial Action Planned.

SEMS EPA ID	Site Name	NPL Status	Non-NPL Status
KSD007124613	Everseal Gasket & Sampling Inc	No	NFRAP
KSD056027311	Kemper Company	No	NFRAP
KSD984992826	S W Blvd Drum	No	NFRAP
KSN000706531	2555 South Ferree	No	NFRAP
KST210010690	Electrical Equipment Processing Center	No	NFRAP

Table E3. KDHE solid waste facilities within 0.5 miles of the Natural Reach area.

KDHE Facility ID	KDHE Program	Status	Facility Name
2039-SOLWASTE	Solid Waste -- Regulated Facilities	Active	Planet Marrs Recycling

Table E4. Resource Conservation and Recovery Act (RCRA) hazardous waste facilities within 0.5 miles of the Natural Reach area. VSQG = Very Small Quantity Generator. SQG = Small Quantity Generator.

Identifier	Site Name	Compliance Status	Universe	Status
KS0000081554	Smoot Co.	No Violation Identified	VSQG	Active (H)
KS0000081562	Smoot Co.	No Violation Identified	VSQG	Active (H)
KSD007144686	Hinckley Springs	No Violation Identified	Other	Inactive
KSD031285752	Campbell Crankshaft	No Violation Identified	Other	Inactive
KSD045101623	St Louis-San Francisco Ry Co	No Violation Identified	Other	Inactive
KSD052890761	Research Flour SVC Products Co	No Violation Identified	Other	Inactive
KSD056027311	Kemper Co	No Violation Identified	Other	Inactive
KSD056385743	McFadden Co	No Violation Identified	Other	Inactive
KSD065303984	Martins Body Shop	No Violation Identified	VSQG	Active (H)
KSD076269323	Shartzler Motors	No Violation Identified	Other	Inactive
KSD981127327	Electronic Crystals Corp	No Violation Identified	Other	Inactive
KSD981702541	Macks Foreign Car Rpr Svc	No Violation Identified	Other	Inactive
KSD984978361	American Dish	No Violation Identified	Other	Inactive
KSD984989038	K C Motor Sports	No Violation Identified	Other	Inactive
KSD984989426	Prose Inc	No Violation Identified	VSQG	Active (H)
KSD984992735	Imports Only, Inc.	No Violation Identified	Other	Inactive
KSD984994095	Hicks Elec Co	No Violation Identified	VSQG	Active (H)
KSD985001205	Midwest Sales & Svc	No Violation Identified	Other	Inactive
KSD985016898	Midwest Sales Inc	No Violation Identified	VSQG	Active (H)
KSP000000906	Mid Central Concrete Inc	No Violation Identified	Other	Inactive
KSP000002125	ECP Properties	No Violation Identified	Other	Inactive
KSR000007864	Tool Hosp	No Violation Identified	VSQG	Active (H)
KSR000008615	Jahan Enterprises	No Violation Identified	Other	Inactive
KSR000009696	McCall Service Station #1	No Violation Identified	Other	Inactive
KSR000010090	Epoxy Coating Specialists Inc	No Violation Identified	VSQG	Active (H)
KSR000010462	Ogers Painting Co Inc	No Violation Identified	Other	Inactive
KSR000506378	Premier Contracting	No Violation Identified	SQG	Active (H)
KSR597178731	Unified Government of Wyandotte Co	No Violation Identified	Other	Inactive

Table E5. KDHE reported spills within 0.5 miles of the Natural Reach area.

Spill Number	Reported Date/Time	Spill or Complaint	Status	Closed Date
42942	2/1/2018 1:26	Spill	Closed	5/10/2018
43585	6/21/2018 9:01	Spill	Closed	6/28/2018
KDHE-01536	6/15/1989 8:30	Spill	Closed	8/20/2002
KDHE-04633	1/3/1992 16:30	Spill	Closed	7/10/1992
KDHE-05607	9/17/1992 10:20	Spill	Closed	12/15/1992
KDHE-07729	4/12/1994 15:07	Spill	Closed	1/6/1995
KDHE-10427	6/24/1996 9:37	Spill	Closed	6/26/1996
KDHE-11432	6/7/1997 15:15	Spill	Closed	6/5/1997
KDHE-18017	1/2/1986 10:15	Spill	Closed	3/10/1986
KDHE-18050	12/10/1986 13:00	Spill	Closed	12/11/1986
KDHE-29045	9/19/2005 15:15	Spill	Closed	11/14/2005
KDHE-29175	1/20/2006 15:30	Spill	Closed	1/4/2007
KDHE-32011	11/5/2009 16:18	Spill	Closed	11/12/2009
KDHE-36378	9/17/2015 14:44	Spill	Closed	9/23/2015

Table E6. KDHE leaking underground storage tanks (LUSTs) within 0.5 miles of the Natural Reach area.

Project Code	Project Name	Status	Initial Report Date	Substance Released	Leak Type
A4-105-40225	Gard Corporation	Closed	8/11/2000	lube oil	Not listed
A4-105-40284	Smoot Company	Closed	11/5/2003	Hydraulic Oil	Tank
U4-105-00157	Clorox Company	Closed	11/18/1988	fuel oil	Other
U4-105-01013	Go Gas Cafe	Monitor	7/8/1991	gasoline	Piping
U4-105-01107	Rew Materials	Closed	10/21/1991	gasoline	Tank
U4-105-01240	BNSF RR, Rosedale Railyard	Closed	5/21/1992	Not listed	Not listed
U4-105-01344	Miligles Market	Closed	12/8/1992	gasoline	Spill/Overfill
U4-105-01560	Fire Station #10, KC	Closed	12/29/1993	Not listed	Not listed
U4-105-01649	Hinckley & Schmitt	Closed	7/18/1994	diesel fuel	Spill/Overfill
U4-105-12849	Mccall's Service #1	Monitor	11/3/1999	gas, diesel	Tank
U4-105-13138	Armour Amusement Co.	Closed	9/21/2001	Not listed	Not listed
U4-105-13365	Hinckley Springs Water Co.	Monitor	1/27/2003	Motor oil & diesel	Other

Table E7. KDHE underground storage tanks (USTs) within or adjacent to the Natural Reach area.

Tank Facility ID	Site Name	Status	Effective Date	Notes	Location
5258	Hinckley Springs	Permanently Out of Service	7/18/2000	3 diesel tanks	NW adjacent property
29471	Armour Amusement Company	Permanently Out of Service	7/11/1997	1 gas tank	On property, laydown area

APPENDIX F
EJScreen Results

EJScreen Report (Version 2.1)

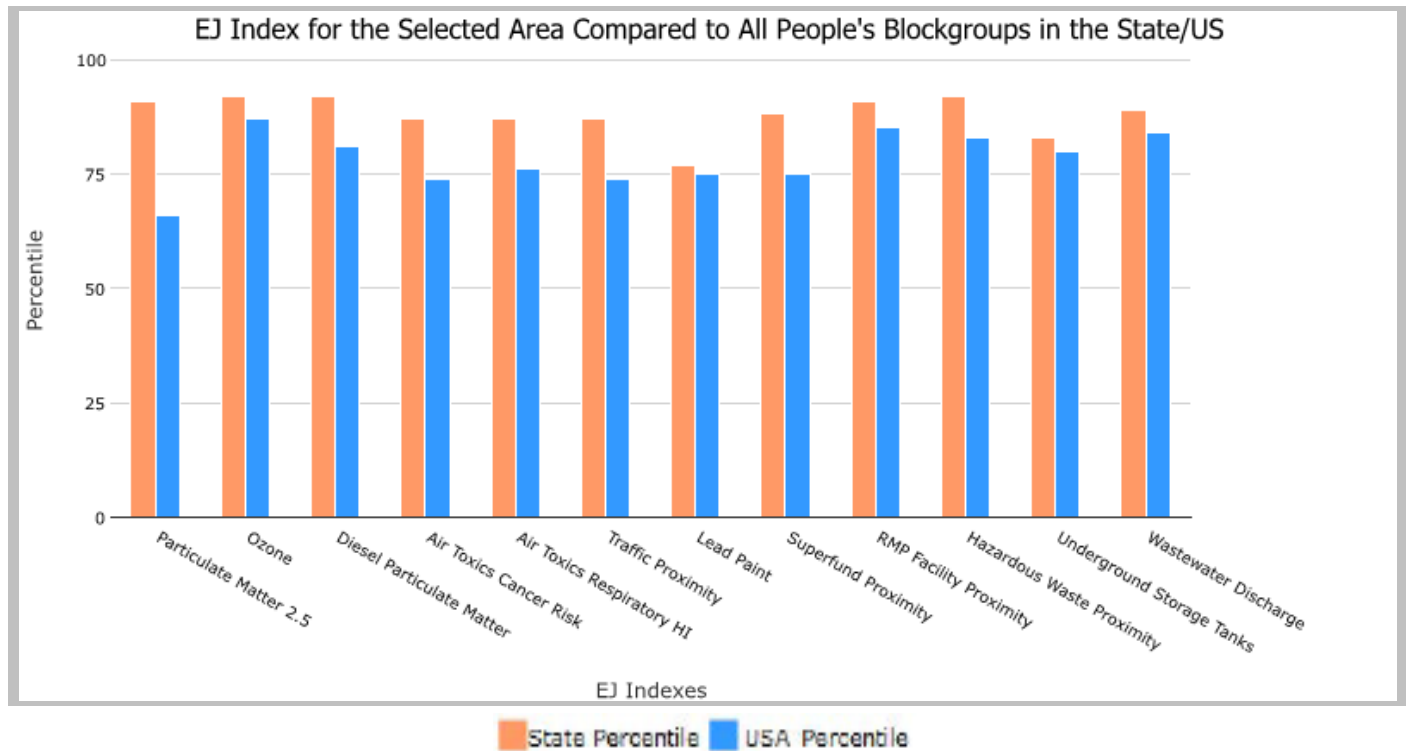
1 mile Ring around the Area, KANSAS, EPA Region 7

Approximate Population: 11,777

Input Area (sq. miles): 3.91

(The study area contains 2 blockgroup(s) with zero population.)

Selected Variables	State Percentile	USA Percentile
Environmental Justice Indexes		
EJ Index for Particulate Matter 2.5	91	66
EJ Index for Ozone	92	87
EJ Index for Diesel Particulate Matter*	92	81
EJ Index for Air Toxics Cancer Risk*	87	74
EJ Index for Air Toxics Respiratory HI*	87	76
EJ Index for Traffic Proximity	87	74
EJ Index for Lead Paint	77	75
EJ Index for Superfund Proximity	88	75
EJ Index for RMP Facility Proximity	91	85
EJ Index for Hazardous Waste Proximity	92	83
EJ Index for Underground Storage Tanks	83	80
EJ Index for Wastewater Discharge	89	84



This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJScreen Report (Version 2.1)

1 mile Ring around the Area, KANSAS, EPA Region 7

Approximate Population: 11,777

Input Area (sq. miles): 3.91

(The study area contains 2 blockgroup(s) with zero population.)



Sites reporting to EPA	
Superfund NPL	0
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	3

EJScreen Report (Version 2.1)

1 mile Ring around the Area, KANSAS, EPA Region 7

Approximate Population: 11,777

Input Area (sq. miles): 3.91

(The study area contains 2 blockgroup(s) with zero population.)

Selected Variables	Value	State Avg.	%ile in State	USA Avg.	%ile in USA
Pollution and Sources					
Particulate Matter 2.5 ($\mu\text{g}/\text{m}^3$)	8.41	8	81	8.67	45
Ozone (ppb)	46.5	45.1	90	42.5	84
Diesel Particulate Matter* ($\mu\text{g}/\text{m}^3$)	0.436	0.21	98	0.294	80-90th
Air Toxics Cancer Risk* (lifetime risk per million)	30	25	99	28	80-90th
Air Toxics Respiratory HI*	0.4	0.33	98	0.36	80-90th
Traffic Proximity (daily traffic count/distance to road)	810	290	92	760	77
Lead Paint (% Pre-1960 Housing)	0.42	0.34	55	0.27	67
Superfund Proximity (site count/km distance)	0.084	0.081	69	0.13	61
RMP Facility Proximity (facility count/km distance)	2.9	1.1	91	0.77	94
Hazardous Waste Proximity (facility count/km distance)	5.6	1.3	97	2.2	89
Underground Storage Tanks (count/km ²)	5.3	3.5	76	3.9	78
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.037	1.8	79	12	78
Socioeconomic Indicators					
Demographic Index	45%	28%	83	35%	70
People of Color	49%	25%	85	40%	66
Low Income	41%	29%	71	30%	69
Unemployment Rate	3%	4%	55	5%	43
Limited English Speaking Households	8%	2%	88	5%	82
Less Than High School Education	15%	9%	80	12%	71
Under Age 5	7%	6%	60	6%	66
Over Age 64	6%	16%	15	16%	14

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: <https://www.epa.gov/haps/air-toxics-data-update>.

For additional information, see: www.epa.gov/environmentaljustice

EJScreen is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJScreen documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJScreen outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

APPENDIX G
Agency Coordination



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Kansas Ecological Services Field Office
2609 Anderson Avenue
Manhattan, KS 66502-2801
Phone: (785) 539-3474 Fax: (785) 539-8567

In Reply Refer To:
Project Code: 2023-0032535
Project Name: Lower Turkey Creek Streambank Stabilization

March 30, 2023

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 ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

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:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.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/birds/policies-and-regulations.php>.

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/birds/bird-enthusiasts/threats-to-birds.php>.

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/birds/policies-and-regulations/executive-orders/e0-13186.php>.

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

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:

Kansas Ecological Services Field Office

2609 Anderson Avenue

Manhattan, KS 66502-2801

(785) 539-3474

PROJECT SUMMARY

Project Code: 2023-0032535

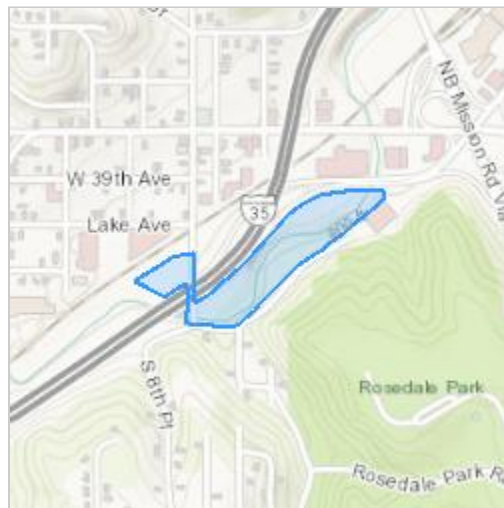
Project Name: Lower Turkey Creek Streambank Stabilization

Project Type: Modification Stream or Waterbody

Project Description: As part of the Lower Turkey Creek Flood Risk Management Project, a minor modification is proposed along the Natural Reach (directly upstream from the Walled Channel Reach). The project proposes to construct LPSTP and bank revetments to address bank instability, bed degradation, and conveyance issues. Less than 1,000 feet of streambank would be effected and rock tiebacks would also be used to ensure stream flanking does not occur. Minimal clearing and grading would occur to implement project designs.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@39.05632575,-94.62849762199724,14z>



Counties: Wyandotte County, Kansas

ENDANGERED SPECIES ACT SPECIES

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

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

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

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

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

MAMMALS

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Threatened
Tricolored Bat <i>Perimyotis subflavus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

FISHES

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

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> 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.

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Max Headlee
Address: 601 E 12th Street
City: Kansas City
State: MO
Zip: 64106
Email: max.r.headlee@usace.army.mil
Phone: 8163893134

From: [KansasES, FW6](#)
To: [Headlee, Max R CIV USARMY CENWK \(USA\)](#)
Subject: [URL Verdict: Neutral][Non-DoD Source] RE: [EXTERNAL] FW: Lower Turkey Creek Natural Reach Stabilization
Date: Thursday, March 30, 2023 12:00:54 PM

Hi Max,

Highly negligible for the bank stab. project given the locality and distance from the Kansas River.

Jason S. Luginbill, Project Leader
U.S. Fish and Wildlife Service
Ecological Services
2609 Anderson Ave.
Manhattan, KS 66502
Cell: 785-313-0772
Fax: 785-539-8567

Please call work cell, thank you

From: Headlee, Max R CIV USARMY CENWK (USA) <Max.R.Headlee@usace.army.mil>
Sent: Thursday, March 30, 2023 7:58 AM
To: KansasES, FW6 <KansasES@fws.gov>
Subject: RE: [EXTERNAL] FW: Lower Turkey Creek Natural Reach Stabilization

Good morning,

Thank you for this response. Just to confirm: do you recommend that we consider potential impacts to pallid sturgeon? The species was identified in the project's IPaC report (please see attached). Passage of Kansas River fish into Turkey Creek is limited by the steep gradient of the Turkey Creek Tunnel at the stream's confluence. Should the Corps consider potential downstream impacts to pallid sturgeon, or would you say that the project is far enough removed from the Kansas River that this risk is negligible for a bank stabilization project?

Thank you,

Max Headlee
Environmental Resources Specialist
US Army Corps of Engineers, Kansas City District
Office: (816) 389-3134

From: KansasES, FW6 <KansasES@fws.gov>
Sent: Wednesday, March 29, 2023 11:12 AM
To: Headlee, Max R CIV USARMY CENWK (USA) <Max.R.Headlee@usace.army.mil>
Subject: [URL Verdict: Neutral][Non-DoD Source] RE: [EXTERNAL] FW: Lower Turkey Creek Natural Reach Stabilization

Hi Max,

On November 30, 2022 the U.S. Fish and Wildlife Service (Service) published a final rule to reclassify the northern long-eared bat as endangered under the Endangered Species Act. The rule becomes effective March 31, 2023.

You can find information related to the northern long-eared bat at the ECOS species profile located here: <https://ecos.fws.gov/ecp/species/9045> and the Service's Northern Long-Eared Bat web page: <https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis>

A Range-wide Northern Long-eared Bat determination key is available through the Service's IPaC website. The goal is to streamline review of routine, predictable projects that are not likely to adversely affect the NLEB. It allows project proponents to receive automatic verification or concurrence for some actions.

The monarch butterfly, a candidate for listing under the ESA has a proposed listing rule currently scheduled for Fiscal Year 2024 (i.e., October 2023-September 2024). Information on the Monarch Nationwide Candidate Conservation Agreement with Assurances for Energy and Transportation Lands can be accessed at <https://rightofway.erc.uic.edu/national-monarch-ccaa/>. This process can provide certainty for project planners and provide conservation for the species.

We have no further comments. Please accept this email as our official response, thank you.

Jason S. Luginbill, Project Leader
U.S. Fish and Wildlife Service
Ecological Services
2609 Anderson Ave.
Manhattan, KS 66502
Cell: 785-313-0772
Fax: 785-539-8567

Please call work cell, thank you

From: Headlee, Max R CIV USARMY CENWK (USA) <Max.R.Headlee@usace.army.mil>
Sent: Wednesday, March 29, 2023 7:33 AM
To: KansasES, FW6 <KansasES@fws.gov>
Subject: [EXTERNAL] FW: Lower Turkey Creek Natural Reach Stabilization

This email has been received from outside of DOI - Use caution before clicking on links, opening attachments, or responding.

Good morning,

This is a reminder that the Corps is seeking to coordinate with USFWS regarding a streambank stabilization study in the Kansas City metro area. Please see the attached letter.

Thank you,

Max Headlee
Environmental Resources Specialist
US Army Corps of Engineers, Kansas City District
Office: (816) 389-3134

From: Headlee, Max R CIV USARMY CENWK (USA)
Sent: Monday, February 13, 2023 1:23 PM
To: kansases@fws.gov
Subject: Lower Turkey Creek Natural Reach Stabilization

Good afternoon,

Please see the attached letter regarding an environmental assessment that the Corps is writing to evaluate alternatives for addressing stream instability in Turkey Creek as part of the broader Turkey Creek Flood Damage Reduction Project. Please call or email me for any comments or questions about this project.

Thank you,

Max Headlee
Environmental Resources Specialist
US Army Corps of Engineers, Kansas City District
Office: (816) 389-3134



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Kansas Ecological Services Field Office
2609 Anderson Avenue
Manhattan, KS 66502-2801
Phone: (785) 539-3474 Fax: (785) 539-8567

In Reply Refer To:
Project code: 2023-0032535
Project Name: Lower Turkey Creek Streambank Stabilization

March 30, 2023

Federal Nexus: yes
Federal Action Agency (if applicable): Army Corps of Engineers

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for 'Lower Turkey Creek Streambank Stabilization'

Dear Max Headlee:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on March 30, 2023, for 'Lower Turkey Creek Streambank Stabilization' (here forward, Project). This project has been assigned Project Code 2023-0032535 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements may not be complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into the IPaC must accurately represent the full scope and details of the Project. Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat Rangewide Determination Key (DKey), invalidates this letter.

Determination for the Northern Long-Eared Bat

Based upon your IPaC submission and a standing analysis completed by the Service, your project has reached the determination of “May Affect, Not Likely to Adversely Affect” the northern long-eared bat. Unless the Service advises you within 15 days of the date of this letter that your IPaC-assisted determination was incorrect, this letter verifies that consultation on the Action is complete and no further action is necessary unless either of the following occurs:

- new information reveals effects of the action that may affect the northern long-eared bat in a manner or to an extent not previously considered; or,
- the identified action is subsequently modified in a manner that causes an effect to the northern long-eared bat that was not considered when completing the determination key.

15-Day Review Period

As indicated above, the Service will notify you within 15 calendar days if we determine that this proposed Action does not meet the criteria for a “may affect, not likely to adversely affect” (NLAA) determination for the northern long-eared bat. If we do not notify you within that timeframe, you may proceed with the Action under the terms of the NLAA concurrence provided here. This verification period allows the identified Ecological Services Field Office to apply local knowledge to evaluation of the Action, as we may identify a small subset of actions having impacts that we did not anticipate when developing the key. In such cases, the identified Ecological Services Field Office may request additional information to verify the effects determination reached through the Northern Long-eared Bat DKey.

You have indicated that you must remove a hazard tree in order to prevent imminent loss of human life. Be advised that the Act’s implementing regulations (50 CFR part 17) include a take exemption pursuant to the defense of human life (for endangered species, see 50 CFR 17.21(c) (2)): “any person may take endangered [or threatened] wildlife in defense of his own life or the lives of others.”). The regulations at 50 CFR 17.21(c)(4) require that any person taking, including killing, listed wildlife in defense of human life under this exception must notify our headquarters Office of Law Enforcement, at the address provided at 50 CFR 2.1(b), in writing, within 5 days. In addition, section 11 of the Act enumerates the penalties and enforcement of the Act. In regard to civil penalties, section 11(a)(3) of the Act states, “Notwithstanding any other provision of this [Act], no civil penalty shall be imposed if it can be shown by a preponderance of the evidence that the defendant committed an act based on a good faith belief that he was acting to protect himself or herself, a member of his or her family, or any other individual from bodily harm, from any endangered or threatened species” (16 U.S.C. 1540(a)(3)). Section 11(b) (3) of the Act contains similar language in regard to criminal violations (see 16 U.S.C. 1540(b) (3)). If you think incidental take of listed bats was reasonably certain to have occurred as a result of your hazard tree removal, we advise you to contact the Office of Law Enforcement as outlined above. In the future, we recommend planning ahead so that tree removal of potentially hazardous trees does not become an emergency. If you determine an emergency exists, however, and human life is in imminent danger, do not delay action. Also do not delay action if removal of the hazard tree is part of a federal response to a situation involving an act of God, disaster, casualty, national defense or security emergency, etc. - coordinate with the local USFWS field office as soon as practicable after the emergency is under control.

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination for the northern long-eared bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Monarch Butterfly *Danaus plexippus* Candidate
- Pallid Sturgeon *Scaphirhynchus albus* Endangered
- Tricolored Bat *Perimyotis subflavus* Proposed Endangered

You may coordinate with our Office to determine whether the Action may affect the species and/or critical habitat listed above. Note that reinitiation of consultation would be necessary if a new species is listed or critical habitat designated that may be affected by the identified action before it is complete.

If you have any questions regarding this letter or need further assistance, please contact the Kansas Ecological Services Field Office and reference Project Code 2023-0032535 associated with this Project.

Action Description

You provided to IPaC the following name and description for the subject Action.

1. Name

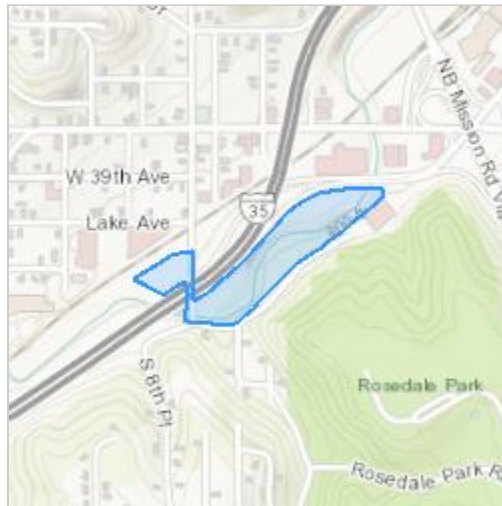
Lower Turkey Creek Streambank Stabilization

2. Description

The following description was provided for the project 'Lower Turkey Creek Streambank Stabilization':

As part of the Lower Turkey Creek Flood Risk Management Project, a minor modification is proposed along the Natural Reach (directly upstream from the Walled Channel Reach). The project proposes to construct LPSTP and bank revetments to address bank instability, bed degradation, and conveyance issues. Less than 1,000 feet of streambank would be effected and rock tiebacks would also be used to ensure stream flanking does not occur. Minimal clearing and grading would occur to implement project designs.

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@39.05632575,-94.62849762199724,14z>



DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect, but not likely to adversely affect” for the Endangered northern long-eared bat (*Myotis septentrionalis*).

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of the northern long-eared bat or any other listed species?

Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

No

2. Do you have post-white nose syndrome occurrence data that indicates that northern long-eared bats (NLEB) present in the action area? Bat occurrence data may include identification of NLEBs in hibernacula, capture of NLEBs, tracking of NLEBs to roost trees, or confirmed acoustic detections.

No

3. Does any component of the action involve construction or operation of wind turbines?

Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

No

4. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

Yes

5. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

No

6. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

Yes

7. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

No

8. Have you determined that your proposed action will have no effect on the northern long-eared bat? Remember to consider the [effects of any activities](#) that would not occur but for the proposed action.

If you think that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, answer "No" below and continue through the key. If you have determined that the northern long-eared bat does not occur in your project's action area and/or that your project will have no effects whatsoever on the species despite the potential for it to occur in the action area, you may make a "no effect" determination for the northern long-eared bat.

Note: Federal agencies (or their designated non-federal representatives) must consult with USFWS on federal agency actions that may affect listed species [50 CFR 402.14(a)]. Consultation is not required for actions that will not affect listed species or critical habitat. Therefore, this determination key will not provide a consistency or verification letter for actions that will not affect listed species. If you believe that the northern long-eared bat may be affected by your project or if you would like assistance in deciding, please answer "No" and continue through the key. Remember that this key addresses only effects to the northern long-eared bat. Consultation with USFWS would be required if your action may affect another listed species or critical habitat. The definition of [Effects of the Action](#) can be found here: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

9. Does the action area contain any caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating northern long-eared bats?

No

10. Does the action area contain or occur within 0.5 miles of (1) talus or (2) anthropogenic or naturally formed rock crevices in rocky outcrops, rock faces or cliffs?

No

11. Is suitable summer habitat for the northern long-eared bat present within 1000 feet of project activities?
(If unsure, answer "Yes.")

Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats (i.e., live trees and/or snags ≥ 3 inches (12.7 centimeter) dbh), answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

Yes

12. Will the action cause effects to a bridge?

No

13. Will the action result in effects to a culvert or tunnel?

No

14. Does the action include the intentional exclusion of northern long-eared bats from a building or structure?

Note: Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local U.S. Fish and Wildlife Services Ecological Services Field Office to help assess whether northern long-eared bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures

No

15. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats**?

No

16. Will the action cause construction of one or more new roads open to the public?

For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

No

17. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic on one or more existing roads?

Note: For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

Yes

18. Will the increased vehicle traffic occur on any road that lies between any two areas of contiguous forest that are each greater than or equal to 10 acres in extent and are separated by less than 1,000 feet? Northern long-eared bats may cross a road by flying between forest patches that are up to 1,000 feet apart.

Note: "Contiguous forest" of 10 acres or more may include areas where multiple forest patches are separated by less than 1,000 feet of non-forested area if the forested patches, added together, comprise at least 10 acres.

No

19. Will the proposed action involve the creation of a new water-borne contaminant source (e.g., leachate pond pits containing chemicals that are not NSF/ANSI 60 compliant)?

No

20. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

No

21. Will the action include drilling or blasting?

No

22. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

No

23. Will the proposed action involve the use of herbicides or pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

Yes

24. Will the action result in herbicide use that may affect suitable summer habitat for the northern long-eared bat?

Note: Additional information defining suitable summer habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

25. Will the action include or cause the application or drift of pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides) into forested areas that are suitable summer habitat for the northern long-eared bat? Answer "Yes" if the application may result in transport (e.g., in water) or aerial drift of the pesticide into forested areas that are suitable summer habitat for the northern long-eared bat.

Note: Additional information defining suitable summer habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

26. Will the action include or cause activities that are reasonably certain to cause chronic nighttime noise in suitable summer habitat for the northern long-eared bat? Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time.

Note: Additional information defining suitable summer habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

27. Does the action include, or is it reasonably certain to cause, the use of artificial lighting within 1000 feet of suitable northern long-eared bat roosting habitat?

Note: Additional information defining suitable roosting habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

No

28. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

Yes

29. Has a presence/probable absence summer bat survey targeting the northern long-eared bat following the Service's [Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines](#) been conducted within the project area? If unsure, answer "No."

No

30. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

Note: A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property and has a diameter breast height of six inches or greater.

Yes

31. Are any of the trees proposed for cutting or other means of knocking down, bringing down, topping, or trimming suitable for northern long-eared bat roosting (i.e., live trees and/or snags ≥ 3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities)?

Yes

32. [Semantic] Does your project intersect a known sensitive area for the northern long-eared bat?

Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your [state agency or USFWS field office](#)

Automatically answered

No

33. Will all tree cutting/trimming or other knocking or bringing down of trees be restricted to the inactive season for the northern long-eared bat?

Note: Inactive Season dates for summer habitat outside of staging and swarming areas can be found here: <https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas>.

Yes

34. Will the action cause trees to be cut, knocked down, or otherwise brought down across an area greater than 10 acres?

No

35. Will the action cause trees to be cut, knocked down, or otherwise brought down in a way that would fragment a forested connection (e.g., tree line) between two or more forest patches of at least 5 acres?

The forest patches may consist of entirely contiguous forest or multiple forested areas that are separated by less than 1000' of non-forested area. A project will fragment a forested connection if it creates an unforested gap of greater than 1000'.

No

36. Will the action result in the use of prescribed fire?

No

37. Will the action cause noises that are louder than ambient baseline noises within the action area?

Yes

38. Will the action cause noises during the active season in suitable summer habitat that are louder than anthropogenic noises to which the affected habitat is currently exposed? Answer 'no' if the noises will occur only during the inactive period.

Note: Inactive Season dates for areas within a spring staging/fall swarming area can be found here: <https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas>.

Note: Additional information defining suitable summer habitat for the northern long-eared bat can be found at: <https://www.fws.gov/media/northern-long-eared-bat-assisted-determination-key-selected-definitions>

Yes

PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

1.5

In what extent of the area (in acres) will trees be cut, knocked down, or trimmed during the inactive (hibernation) season for northern long-eared bat? **Note:** Inactive Season dates for spring staging/fall swarming areas can be found here: <https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas>

1.5

In what extent of the area (in acres) will trees be cut, knocked down, or trimmed during the active (non-hibernation) season for northern long-eared bat? **Note:** Inactive Season dates for spring staging/fall swarming areas can be found here: <https://www.fws.gov/media/inactive-season-dates-swarming-and-staging-areas>

0

Will all potential northern long-eared bat (NLEB) roost trees (trees ≥ 3 inches diameter at breast height, dbh) be cut, knocked, or brought down from any portion of the action area greater than or equal to 0.1 acre? If all NLEB roost trees will be removed from multiple areas, select 'Yes' if the cumulative extent of those areas meets or exceeds 0.1 acre.

Yes

Enter the extent of the action area (in acres) from which all potential NLEB roost trees will be removed. If all NLEB roost trees will be removed from multiple areas, entire the total extent of those areas. Round up to the nearest tenth of an acre.

1.5

For the area from which all potential northern long-eared bat (NLEB) roost trees will be removed, on how many acres (round to the nearest tenth of an acre) will trees be allowed to regrow? Enter '0' if the entire area from which all potential NLEB roost trees are removed will be developed or otherwise converted to non-forest for the foreseeable future.

1.5

Will any snags (standing dead trees) ≥ 3 inches dbh be left standing in the area(s) in which all northern long-eared bat roost trees will be cut, knocked down, or otherwise brought down?

No

Will all project activities be completed by April 1, 2024?

No

IPAC USER CONTACT INFORMATION

Agency: Army Corps of Engineers
Name: Max Headlee
Address: 601 E 12th Street
City: Kansas City
State: MO
Zip: 64106
Email: max.r.headlee@usace.army.mil
Phone: 8163893134

From: [Hofmeier, Jordan \[KDWP\]](#)
To: [Headlee, Max R CIV USARMY CENWK \(USA\)](#)
Subject: [URL Verdict: Unknown][Non-DoD Source] KDWP Review: Turkey Creek Flood Damage Reduction Project, WY Co. (Track #19970164-19)
Date: Tuesday, March 7, 2023 2:10:21 PM

Max,

Below is a summary of wildlife/fisheries occurrence data I examined for Turkey Creek.

There is no Designated Critical Habitat for Kansas Threatened or Endangered Species within Turkey Creek at this time.

Kansas Natural Heritage Inventory Species of Concern data layers - no terrestrial or aquatic species of concern documented within Turkey Creek.

5 sites within Turkey Creek were surveyed by the KDWP Stream Survey and Monitoring Program in 2003. Fish community data from those surveys are in the table below and should provide a good baseline of what fish could be expected to occur at the potential project location. No native freshwater mussels were documented.

Date	Common Name	Number	Stream	County
7/7/2003	fathead minnow	415	Turkey Creek	Johnson
7/7/2003	creek chub	120	Turkey Creek	Johnson
7/7/2003	green sunfish	2	Turkey Creek	Johnson
7/7/2003	creek chub	22	Turkey Creek	Johnson
7/7/2003	green sunfish	8	Turkey Creek	Johnson
7/7/2003	red shiner	10	Turkey Creek	Johnson
7/7/2003	fathead minnow	116	Turkey Creek	Johnson
7/7/2003	creek chub	7	Turkey Creek	Johnson
7/7/2003	black bullhead	1	Turkey Creek	Johnson
7/7/2003	green sunfish	2	Turkey Creek	Johnson
7/7/2003	largemouth bass	1	Turkey Creek	Johnson
7/7/2003	green sunfish	39	Turkey Creek	Johnson
7/7/2003	red shiner	4	Turkey Creek	Johnson
7/7/2003	creek chub	11	Turkey Creek	Johnson
7/7/2003	fathead minnow	37	Turkey Creek	Johnson
7/8/2003	red shiner	16	Turkey Creek	Johnson
7/8/2003	fathead minnow	140	Turkey Creek	Johnson
7/8/2003	creek chub	64	Turkey Creek	Johnson
7/8/2003	black bullhead	1	Turkey Creek	Johnson
7/8/2003	green sunfish	12	Turkey Creek	Johnson
7/8/2003	green sunfish	46	Turkey Creek	Johnson

7/8/2003 fathead minnow	58 Turkey Creek	Johnson
7/8/2003 creek chub	72 Turkey Creek	Johnson
7/8/2003 red shiner	19 Turkey Creek	Johnson
7/8/2003 green sunfish	8 Turkey Creek	Johnson
7/8/2003 creek chub	17 Turkey Creek	Johnson
7/8/2003 fathead minnow	6 Turkey Creek	Johnson
7/8/2003 red shiner	1 Turkey Creek	Johnson
7/8/2003 fathead minnow	263 Turkey Creek	Johnson
7/8/2003 creek chub	96 Turkey Creek	Johnson
7/8/2003 green sunfish	1 Turkey Creek	Johnson
7/9/2003 red shiner	49 Turkey Creek	Johnson
7/9/2003 fathead minnow	51 Turkey Creek	Johnson
7/9/2003 creek chub	100 Turkey Creek	Johnson
7/9/2003 green sunfish	5 Turkey Creek	Johnson
7/9/2003 green sunfish	107 Turkey Creek	Johnson
7/9/2003 creek chub	11 Turkey Creek	Johnson
7/9/2003 red shiner	38 Turkey Creek	Johnson
7/9/2003 fathead minnow	7 Turkey Creek	Johnson
7/10/2003 red shiner	3 Turkey Creek	Wyandotte
7/10/2003 fathead minnow	34 Turkey Creek	Wyandotte
7/10/2003 creek chub	15 Turkey Creek	Wyandotte
7/10/2003 green sunfish	1 Turkey Creek	Wyandotte
7/10/2003 green sunfish	16 Turkey Creek	Wyandotte

Regarding other wildlife occurrences, the Kansas Herpetofaunal and the Kansas Mammal atlases could prove useful for collecting baseline information.

Please let me know if there is any other information we can provide.

Thanks,

Jordan Hofmeier | *Aquatic Ecologist*
Kansas Department of Wildlife and Parks
512 SE 25th Ave | Pratt, KS 67124
T: (620) 672-0798 | ksoutdoors.com
C: (785) 249-0874 | chickadeecheckoff.com

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From: [Michael E. Rinehart](#)
To: [Headlee, Max R CIV USARMY CENWK \(USA\)](#)
Subject: [URL Verdict: Neutral][Non-DoD Source] FW: Lower Turkey Creek Natural Reach Stabilization
Date: Monday, February 20, 2023 10:22:47 AM
Attachments: [Lower Turkey Creek_KDOT_13Feb2023.pdf](#)

Photos from April 18, 2022 taken by me when alerted to the fact that there has been considerable erosion taking place from migration of Turkey Creek against the I-35 system of roadways in the vicinity of Mission Road and Southwest Blvd. KDOT supports any actions taken to restore the formal channel and to repair and protect slopes associated with I-35NB and the ramp shown in the pictures.



Michael E. Rinehart, P.E. | Metro Engineer

O: 913.942.3111

Michael.E.Rinehart@KS.gov

Kansas Department of Transportation

1290 S. Enterprise Dr.

Olathe, KS 66061



Follow us!

From: Kim Stich [KDOT] <Kim.Stich@ks.gov>
Sent: Monday, February 13, 2023 1:31 PM
To: Delaney Tholen [KDOT] <Delaney.Tholen@ks.gov>; Kelly Kultala [KDOT] <Kelly.Kultala@ks.gov>
Cc: Steve Hale [KDOT] <Steve.Hale@ks.gov>; Ryan Barrett [KDOT] <Ryan.Barrett@ks.gov>; Michael E. Rinehart <Michael.E.Rinehart@ks.gov>
Subject: FW: Lower Turkey Creek Natural Reach Stabilization

Making sure you all have this, and please forward to whoever else needs it – thanks

From: Headlee, Max R CIV USARMY CENWK (USA) <Max.R.Headlee@usace.army.mil>
Sent: Monday, February 13, 2023 1:21 PM
To: KDOT#PublicInfo <KDOT#PublicInfo@ks.gov>
Subject: Lower Turkey Creek Natural Reach Stabilization

EXTERNAL: This email originated from outside of the organization. Do not click any links or open any attachments unless you trust the sender and know the content is safe.

Good afternoon,

Please see the attached letter regarding an environmental assessment that the Corps is writing to evaluate alternatives for addressing stream instability in Turkey Creek as part of the broader Turkey Creek Flood Damage Reduction Project. Please call or email me for any comments or questions about this project.

Thank you,

Max Headlee
Environmental Resources Specialist
US Army Corps of Engineers, Kansas City District
Office: (816) 389-3134

KSR&C No. 22-02-079
February 24, 2022

Gina Powell
U.S. Army Corps of Engineers
Via E-Mail

RE: Bank Stabilization
Turkey Creek Natural Reach
Wyandotte County

Dear Dr. Powell:

The Kansas State Historic Preservation Office has reviewed a report describing investigations centered on the natural reach of Turkey Creek near I-35 and Mission Road in Wyandotte County. We find the report to be acceptable. We note that the project area has seen substantial disturbance in recent decades, including the straightening of Turkey Creek and the construction of nearby Interstate Highway 35. That documented disturbance, coupled with the bore hole results, suggests that there is virtually no potential for intact surface or buried cultural resources within the project area. We therefore concur that the project will have no effect on cultural resources as defined in 36 CFR 800. Our office has no objection to the Turkey Creek natural reach stabilization project.

This information is provided at your request to assist you in identifying historic properties, as specified in 36 CFR 800 for Section 106 consultation procedures. If you have questions or need additional information regarding these comments, please contact Tim Weston at 785-272-8681 (ext. 214) or Lauren Jones at 785-272-8681 ext. 225. Please refer to the Kansas Review & Compliance number (KSR&C#) above on all future correspondence relating to this project.

Sincerely,

Jennie Chinn
Executive Director and
State Historic Preservation Officer



Patrick Zollner
Deputy State Historic Preservation Officer



U.S. ARMY CORPS OF ENGINEERS,
KANSAS CITY DISTRICT 601 E. 12TH STREET,
635 FEDERAL BLDG KANSAS CITY, MO 64106-2824
Dr. Gina Powell 816) 389-2320
Gina.S.Powell@usace.army.mil

Date: Feb 17, 2022

SUBJECT: Bank Stabilization, Section 34 T11S R25E Turkey Creek, Wyandotte County, Kansas

- Request MOU or MOA
- Copy of SHPO, and Archaeologist Report.
- I concur with (OSA) Office State Archaeologist
- Site Visit/Have Concerns
- No interest in the area geographically
- No Comment or Objections on the proposed undertaking at this time.
- No objections to the project as proposed. Concur with SHPO
- If human skeletal remains and/or any objects falling under NAGPRA are uncovered during construction
Please stop immediately and notify this office.

Sincerely,

Alan Kelley,
Deputy THPO
3345 Thrasher Rd
White Cloud KS 66094
Iowa Tribe of Kansas and Nebraska 785-351-0080 akelley@iowas.org



**EASTERN SHAWNEE
CULTURAL PRESERVATION DEPARTMENT**

70500 East 128 Road, Wyandotte, OK 74370

February 14, 2022

USACE-Kansas City

601 E. 12th Street, 635 Federal Building

Kansas City, MO 64106-2824

RE: *Bank Stabilization Turkey Creek, Wyandotte County, Kansas*

Dear Ms. Powell,

The Eastern Shawnee Tribe has received your letter regarding the above referenced project(s) within Wyandotte County, Kansas. The Eastern Shawnee Tribe is committed to protecting sites important to Tribal Heritage, Culture and Religion. Furthermore, the Tribe is particularly concerned with historical sites that may contain but not limited to the burial(s) of human remains and associated funerary objects.

As described in your correspondence, and upon research of our database(s) and files, we find our people occupied these areas historically and/or prehistorically. However, the project proposes **NO Adverse Effect** or endangerment to known sites of interest to the Eastern Shawnee Tribe. Please continue project as planned. However, should this project inadvertently discover an archeological site or object(s) we request that you immediately contact the Eastern Shawnee Tribe, as well as the appropriate state agencies (within 24 hours). We also ask that all ground disturbing activity stop until the Tribe and State agencies are consulted. Please note that any future changes to this project will require additional consultation.

In accordance with the NHPA of 1966 (16 U.S.C. § 470-470w-6), federally funded, licensed, or permitted undertakings that are subject to the Section 106 review process must determine effects to significant historic properties. As clarified in Section 101(d)(6)(A-B), historic properties may have religious and/or cultural significance to Indian Tribes. Section 106 of NHPA requires Federal agencies to consider the effects of their actions on all significant historic properties (36 CFR Part 800) as does the National Environmental Policy Act of 1969 (43 U.S.C. § 4321-4347 and 40 CFR § 1501.7(a)). This letter evidences NHPA and NEPA historic properties compliance pertaining to consultation with this Tribe regarding the referenced proposed projects.

Thank you, for contacting the Eastern Shawnee Tribe, we appreciate your cooperation. Should you have any further questions or comments please contact our Office.

Sincerely,

Paul Barton, Tribal Historic Preservation Officer (THPO)

Eastern Shawnee Tribe of Oklahoma

(918) 666-5151 Ext:1833