ARDOT Job 001966

SPRINGDALE NORTHERN BYPASS P.E.

(Highway 412 – Highway 112)

NEPA Re-evaluation

August 2023

U.S. Department of Transportation
Federal Highway Administration

Arkansas Department of Transportation

ARDOT Job 001966: Springdale Northern Bypass P.E.

F.A.P. STPF-0004(88)

NEPA Re-evaluation

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Federal Highway Administration

August 15, 2023
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U.S. Department of Transportation
Federal Highway Administration

Submitted pursuant to:
The National Environmental Policy Act (NEPA)
42 U.S.C. §4322(2)(c) and 23 C.F.R. §771

Submitted by:
FEDERAL HIGHWAY ADMINISTRATION
and
ARKANSAS DEPARTMENT OF TRANSPORTATION

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In compliance with the National Environmental Policy Act, this re-evaluation describes the changes to the Selected Alternative design and the project area for ARDOT Job 012326, construction of the Springdale Northern Bypass from Highway 412 to Highway 112 since the Record of Decision in 2006 and the previous re-evaluations in 2014 and 2019. This re-evaluation examines the current project and potential effects on the environment since the issuance of the Record of Decision and the previous re-evaluations. After a thorough review and consideration of this document, based on additional studies and agency approvals, the Federal Highway Administration has determined that all previous findings and decisions remain valid and that no new or additional significant impacts would result from the project. The project may proceed with the current design for the Selected Alternative.

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This re-evaluation and other project materials are available for review online at:

https://www.ardot.gov/divisions/environmental/assessments/impact-statements-eis-assesments-ea/springdale-northern-bypass-highway-412/

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Chapter 1: Project Status

What's in Chapter 1?

Chapter 1 explains the current status of the proposed project.

1.1 What is the purpose of this re-evaluation?

This re-evaluation is being prepared at the direction of the Arkansas Division office of the Federal Highway Administration (FHWA) to examine the 2006 Record of Decision (ROD) and the 2014 and 2019 re-evaluations for the Springdale Northern Bypass (SNB) in Washington and Benton Counties, Arkansas. Figure 1 shows the proposed SNB corridor. This document is being prepared in accordance with the National Environmental Policy Act of 1969 (NEPA) and all other applicable federal and state laws and regulations, specifically 23 CFR § 771.129. Under NEPA, the lead federal agency is required to complete a re-evaluation to update the analyses found in prior NEPA documents when there are changes to the project which could affect the prior determination of potential environmental impacts [23 CFR § 771.129(c)].

The Arkansas Department of Transportation (ARDOT) initiated the original study on the SNB in 1996 with a major investment study to evaluate concepts for alleviating vehicle congestion on Highway 412. The Draft Environmental Impact Statement for the SNB was approved by FHWA in January 2002, the Supplemental Draft Environmental Impact Statement in May 2004, the Final Environmental Impact Statement (FEIS) in October 2005, and the ROD was issued in February 2006. The ROD analyzed the entire SNB corridor, from Highway 412 west of Tontitown to Highway 412 east of Springdale, as ARDOT Job 001966. The corridor was then broken into four sections for construction.

A re-evaluation that focused on the section constructed from Highway 112 to Interstate 49, but included analyses for the entire SNB corridor, was approved in July 2014. An additional re-evaluation to acquire right of way for the section from Highway 412 to the Northwest Arkansas National Airport (XNA) connector was approved in August 2019.

What is a major investment study?

Major investment studies were a tool included in the Intermodal Surface Transportation Efficiency Act of 1991 designed to provide more complete information concerning the options available for addressing identified transportation problems. Major investment studies were a cooperative and collaborative decision making process that expanded the traditional role of many stakeholders and participants from passive reviewers to active contributors.

Project Location

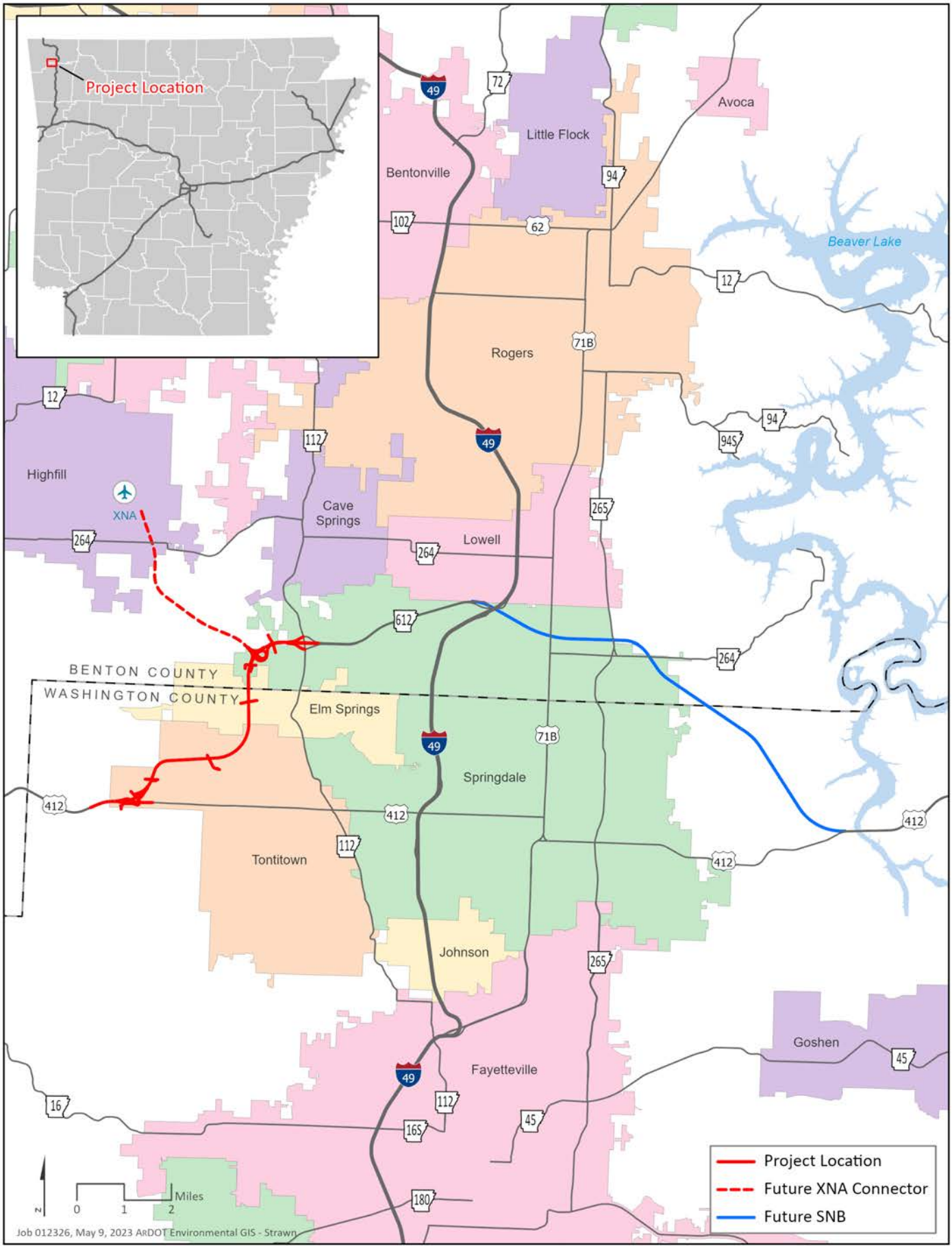


Figure 1

The SNB section from Highway 112 to Interstate 49 has been constructed and open to traffic for several years. ARDOT has proposed to construct the section immediately west from Highway 412 to Highway 112, shown on Figure 1, the focus of this re-evaluation. This section would be constructed under ARDOT Job 012326.

This re-evaluation focuses on design changes for this section and reconsiders potential environmental impacts in light of these design changes to determine whether additional NEPA documentation is warranted or if the previous findings described in the ROD and re-evaluations remain valid. This re-evaluation describes the SNB history, need and purpose, design modifications, environmental impacts, and commitments.

Chapter 2: Project Description

What's in Chapter 2?

Chapter 2 describes the existing conditions in the project area.

2.1 What are the current conditions in the project area?

The project is located in northwest Arkansas in Benton County and the City of Springdale. The project, shown in Figure 1, would provide a congestion relief for the existing Highway 412 corridor, the only continuous principal arterial parallel to, and north of, Interstate 40 in Arkansas. Highway 412 extends from Oklahoma to Missouri, connecting Interstate 49 to Highway 67 (future Interstate 57). Highway 412 is also a Congressionally-designed High Priority Corridor and part of the strategic network of highways that support the nation's economy, defense, and mobility.

In the project area, Highway 412 currently consists of four travel lanes, a center turn lane, and curb and gutter. Sidewalks vary throughout the project area.

The logical termini of this next section of the SNB are Highway 412 to the west and Highway 112 to the east. Beginning construction at Highway 412 provides the connection back to the principal arterial, and Highway 112 is the western terminus of the already-constructed section of the SNB.

Chapter 3: Purpose and Need

What's in Chapter 3?

Chapter 3 identifies the need for the project and why the project is proposed.

3.1 Why is the SNB needed?

The SNB was developed in response to the existing and forecasted vehicular traffic on Highway 412, to reduce congestion and delays, and to increase reliability and safety. Northwest Arkansas, including both Benton County and the City of Springdale, have continued to grow at a much faster rate than the rest of the state, as seen in Table 1.

Table 1

Population Growth in the Project Area

	Population 2010 Census	*Population 2020 Census*	*% Increase 2010-2020*
City of Springdale	69,797	84,161	20.6%
Benton County	221,339	284,333	28.5%
Fayetteville-Springdale-Rogers Metropolitan Area	440,121	546,725	24.4%
State of Arkansas	2,915,918	3,011,524	3.3%

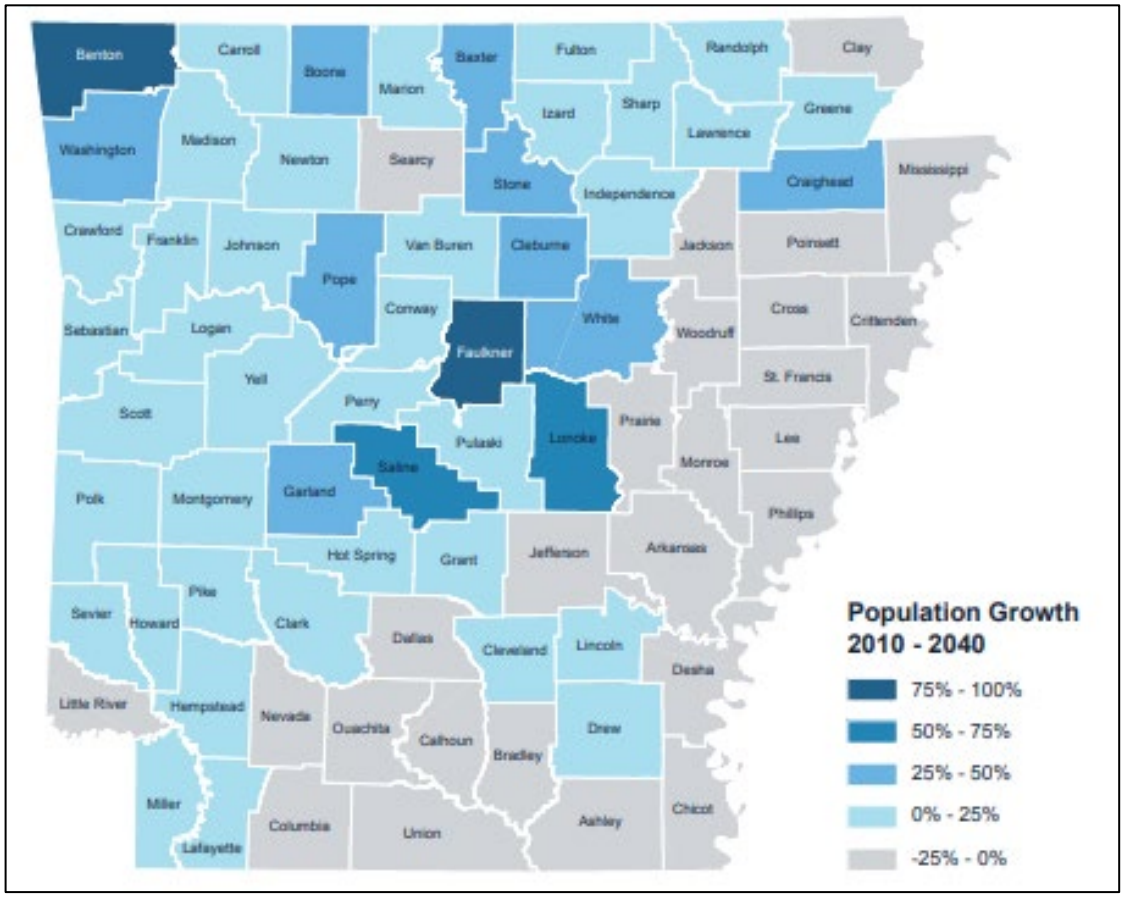
Source: U.S. Census Bureau (census.gov)

Benton County is forecasted to continue to grow at a faster rate than most of the rest of the State of Arkansas through 2040, as seen in Figure 2.

The traffic volumes for Highway 412 in the project area are the highest for the corridor in the state[1]. Traffic operations in this section of Highway 412 are unsatisfactory both under current conditions and in the 20-year forecast. The section of Highway 412 in Springdale is also a fatal and severe vehicle crash hotspot for the corridor in the state.

[1] Arkansas Department of Transportation. 2020. *Highway 412 Corridor Planning Study Update (Oklahoma to Missouri).* https://www.nwarpc.org/wp-content/uploads/2021/01/Hwy-412-Executive-Summary-2020-4.pdf.

Projected Population Growth by County



Source: Statewide Long Range Intermodal Transportation Plan (2017)

Figure 2

Highway 412 also services local, regional and long-haul freight, including agricultural goods, medical supplies, and other goods produced in northern Arkansas. Springdale has the highest truck volumes on the corridor in the state, with an average of approximately 3,400 trucks per day just west of Interstate 49 (ARDOT Highway 412 Corridor Planning Study, 2020). Highway 412 is also a major commuting route between rural areas and major employment centers such as the Fayetteville-Springdale metropolitan area. Congestion on Highway 412 affects the economic competitiveness of the project area, the region, and the State of Arkansas.

3.2 What is the purpose of the project?

The proposed project would address the existing and forecasted travel delays and congestion and increase safety, resiliency, and economic competitiveness.

The Northwest Arkansas Regional Planning Commission (NWARPC), the metropolitan planning organization (MPO) for northwest Arkansas, identified the SNB as "one of the top priorities in the area"[2]. NWARPC identified the SNB as supporting their targets of "truck travel time reliability, travel time reliability, number and rate of serious injury and fatal crashes, and pavement condition."

The Infrastructure and Investment and Jobs Act, signed into law in November 2021, identified the Highway 412 corridor, from Interstate 35 in Noble County, Oklahoma to Interstate 49 in Benton County, Arkansas, as a "High Priority Corridor on the National Highway System." The Oklahoma Department of Transportation and ARDOT, in cooperation with FHWA, have initiated a Planning and Environmental Linkages (PEL) study for this 190-mile section of Highway 412. The overarching goal of the PEL study is to develop a clear and supported plan of action to upgrade Highway 412 to an interstate highway. The PEL identified the western end of the SNB from Highway 412 to Interstate 49 as the alignment for this future interstate.

What is a metropolitan planning organization?

An MPO carries out the transportation planning process for urbanized areas with populations over 50,000, as determined by the U.S. Census. Federal funding for transportation projects within urbanized areas passes through MPOs, who are required to involve the public in their planning processes.

What is PEL?

PEL is a process that allows information, analysis, and decisions made during the planning phase, prior to NEPA, to be used or relied upon dring environmental review. A PEL process is "NEPA-like" and can be used to support decisions such as transportation funding options, defining purpose and need, screening alternatives, and developing programmatic agreements.

[2] Northwest Arkansas Regional Planning Commission. 2022. *Draft Transportation Improvement Program (TIP) FFYs 2023-2026*. https://www.nwarpc.org/wp-content/uploads/2022/10/NARTS_TIP_2023_2026-DRAFT_2022-10-07.pdf.

Chapter 4: Design Modifications

What's in Chapter 4?

Chapter 5 describes the Selected Alternative design changes since the previous NEPA re-evaluations.

4.1 How has the design changed since the previous NEPA re-evaluations?

Since the 2014 and 2019 NEPA re-evaluations, the Selected Alternative typical section, alignment, and design footprint have not changed for the main SNB corridor. Construction of the SNB interchange with the future XNA connector was added to this project since the 2019 NEPA re-evaluation, but the interchange has already gone through all environmental clearances under the XNA connector Environmental Assessment (EA) approved by FHWA in January 2021 and the Finding of No Significant Impact (FONSI) issued by FHWA in June 2022.

The design for the project can be seen in Figure 3. The design cleared under this re-evaluation can be seen in red, while the design cleared under the XNA connector EA and FONSI, but will be constructed as part of the SNB project, can be seen in blue.

Design Modifications

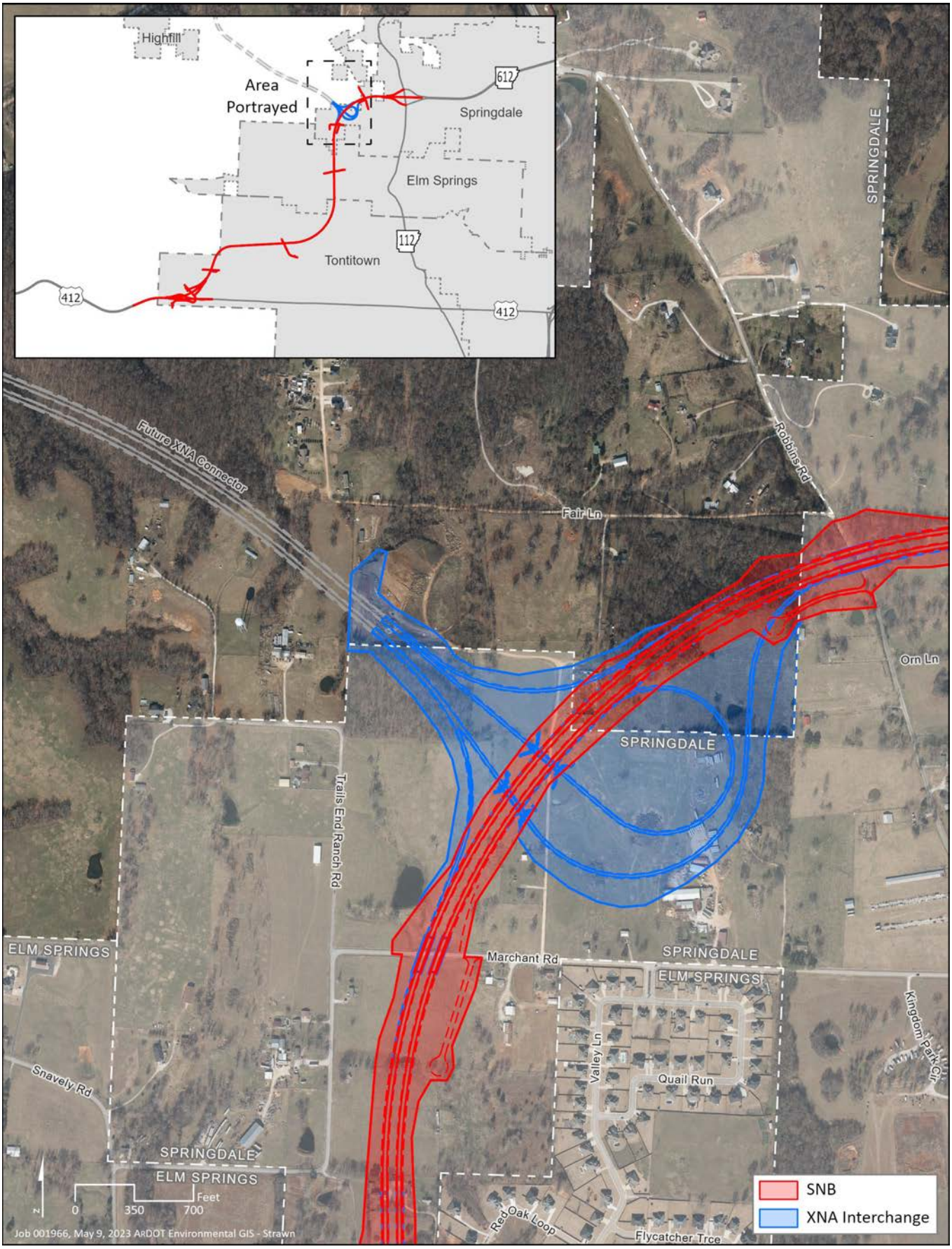


Figure 3

Chapter 5: Environmental Impacts

What's in Chapter 5?

Chapter 5 identifies any changes to the environmental impacts since the previous NEPA re-evaluations. Impacts due to the addition of the XNA connector interchange were cleared under the EA/FONSI for the XNA connector project.

5.1 Would the project affect the local or regional economy?

There are no changes proposed to the Selected Alternative that would affect the economic impacts and benefits evaluated in the Environmental Impact Statement or NEPA re-evaluations.

5.2 Would the project have property impacts?

The 2019 NEPA re-evaluation cleared all right of way acquisition and relocation impacts so the right of way acquisition process could proceed. Right of way acquisition and the relocation process are currently underway. There have been no changes to the design since the 2019 NEPA re-evaluation. Right of way acquisition and relocations as a result of the XNA connector interchange are covered by the EA and FONSI for the XNA connector.

5.3 Would the project impact any environmental justice populations?

Environmental justice refers to social equity in bearing the burden of adverse environmental impacts, especially with regards to low income and minority populations. Executive Order 12898 requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its program, policies, and activities on minority and low income populations.

No environmental justice populations were identified in the project area.

5.4 Would the project impact Important Farmland?

The 2019 NEPA re-evaluation cleared the conversion of Important Farmland to transportation right of way. There have been no changes to the design since the 2019 NEPA re-evaluation. Important Farmland conversions as a result of the XNA connector interchange are covered by the EA and FONSI for the XNA connector.

What is Important Farmland?

Important Farmland is defined by the U.S. Department of Agriculture as land suited to food, feed, forage, fiber, and oilseed crops. Prime farmland is defined by the USDA as the subset of Important Farmland that has the best combination of physical and chemical characteristics for the production of crops. Farmland of Statewide Importance meets a state's criteria for Important Farmland, but does not meet the higher requirements to be designated Prime Farmland.

5.5 Would the project affect views?

Why are visual impacts important?

Impacts to views caused by a highway project are seen both by people traveling on the road and by those using the land adjacent to it, in this case, adjacent property owners who have not previously had views of a highway in this location.

Since the NEPA re-evaluations, the design for the project has not changed; however, there has been some new development along the proposed alignment. The majority of the businesses and homes in the project viewshed were established before the re-evaluations, except for a new subdivision constructed east of the proposed corridor in Elm Springs. These approximately 20 homes with property near the proposed corridor may have a view of the project, although many of the properties have a fence in the backyard that may obstruct their view of the SNB. The remainder of the project corridor remains largely unchanged. Motorists' views from the road would remain similar as the area still consists of a mix of residential, pasture, business, industrial, and forested land.

No additional impacts to views for either motorists or project neighbors are anticipated as a result of this project.

5.5 Would the project cause more noise for adjacent property owners?

A noise study for the entire SNB corridor, including the section from Highway 412 to Highway 112, is currently underway. The noise analysis will be completed in accordance with the ARDOT *Policy on Highway Traffic Noise Abatement* and will include a noise barrier analysis. Where noise barriers are found to be feasible and reasonable under FHWA regulations, nearby property owners will be provided the opportunity to vote on whether or not they want the noise barrier. If the vote is in favor of the barrier, it would be constructed.

5.6 How would the project affect land use?

In order to determine changes since the 2014 NEPA re-evaluation, as there have been changes in both the land use in the project area as well as the project design, land use for the 2014 design was analyzed using the 2013 National Land Cover Dataset, the closest year for which data is available, and the current design was analyzed using the 2019 National Land Cover Dataset, the most recent year for which data is available. The results can be found in Table 2.

The direct land use impacts have not overall substantially changed since the NEPA re-evaluation in any way that would affect the decision-making associated with the proposed project.

Table 2

Land Use/Land Cover Changes

Land Use/Land Cover Category	2014 Design* Impacts	Current Design** Impacts
Barren Land (Rock/Sand/Clay)	0.9 acre	1.3 acre
Deciduous Forest	65.5 acres	57.8 acres
Developed, Open Space	17.1 acres	16.5 acres
Developed, Low Intensity	6.4 acres	6.4 acres
Developed, Medium Intensity	1.6 acre	2.4 acres
Developed, High Intensity	0.2 acre	0.2 acre
Grassland/Herbaceous	8.9 acres	16.7 acres
Mixed Forest	0.7 acre	0.7 acre
Open Water	0.9 acre	0.4 acre
Pasture/Hay	216.8 acres	215.5 acres
Shrub/Scrub	0.9 acre	2.0 acres

*2013 National Land Cover Dataset ** 2019 National Land Cover Dataset

5.7 Would the project impact any historic properties?

Section 106 of the National Historic Preservation Act requires agencies to consider the effects of Federal actions on historic properties. In compliance with Section 106 requirements, ARDOT cultural resource specialists consulted with the State Historic Preservation Officer (SHPO) and Native American tribes.

What are historic properties?

Cultural resources include elements of the built environment (buildings, structures, or objects) or evidence of past human activity (archeological sites). Those that are listed on, or eligible for inclusion in, the NRHP are defined as historic properties.

Preliminary records reviews with the Arkansas Archeological Survey and Arkansas Historic Preservation Program, as well as early maps of the project area, were checked for indications of known archeological sites or historic structures. Archeological and cultural resources surveys of the project area were performed to check for historic structures and archeological sites prior to the issuance of the ROD. Four potential archeological sites were identified for further testing.

SHPO determined that three of the sites should remain "undetermined" in their National Register of Historic Places (NRHP) status with no further work required within the project area.

The fourth site was determined to be eligible for the NRHP. SHPO concurred with an "adverse effect" finding for the proposed project's impacts to the site. A Memorandum of Agreement (MOA) and Treatment Plan mitigating the project's adverse effects was signed by FHWA, SHPO, ARDOT, and the Osage Nation. The MOA and Treatment Plan can be found in Appendix A. Construction will not be

allowed in the area of the eligible archeological site until data recovery is completed.

5.8 How would the project affect water resources?

Streams

Because bridge and culvert plans have not yet been developed for the current design, streams within the project area have been assumed to be impacted at the maximum extent of the project footprint. Permanent stream impacts to five intermittent streams total 3,157 linear feet, and impacts to four ephemeral streams total 3,244 linear feet, for a total of 6,401 linear feet of stream impacts. The location of the stream impacts are shown in Figure 4.

Stream Impacts

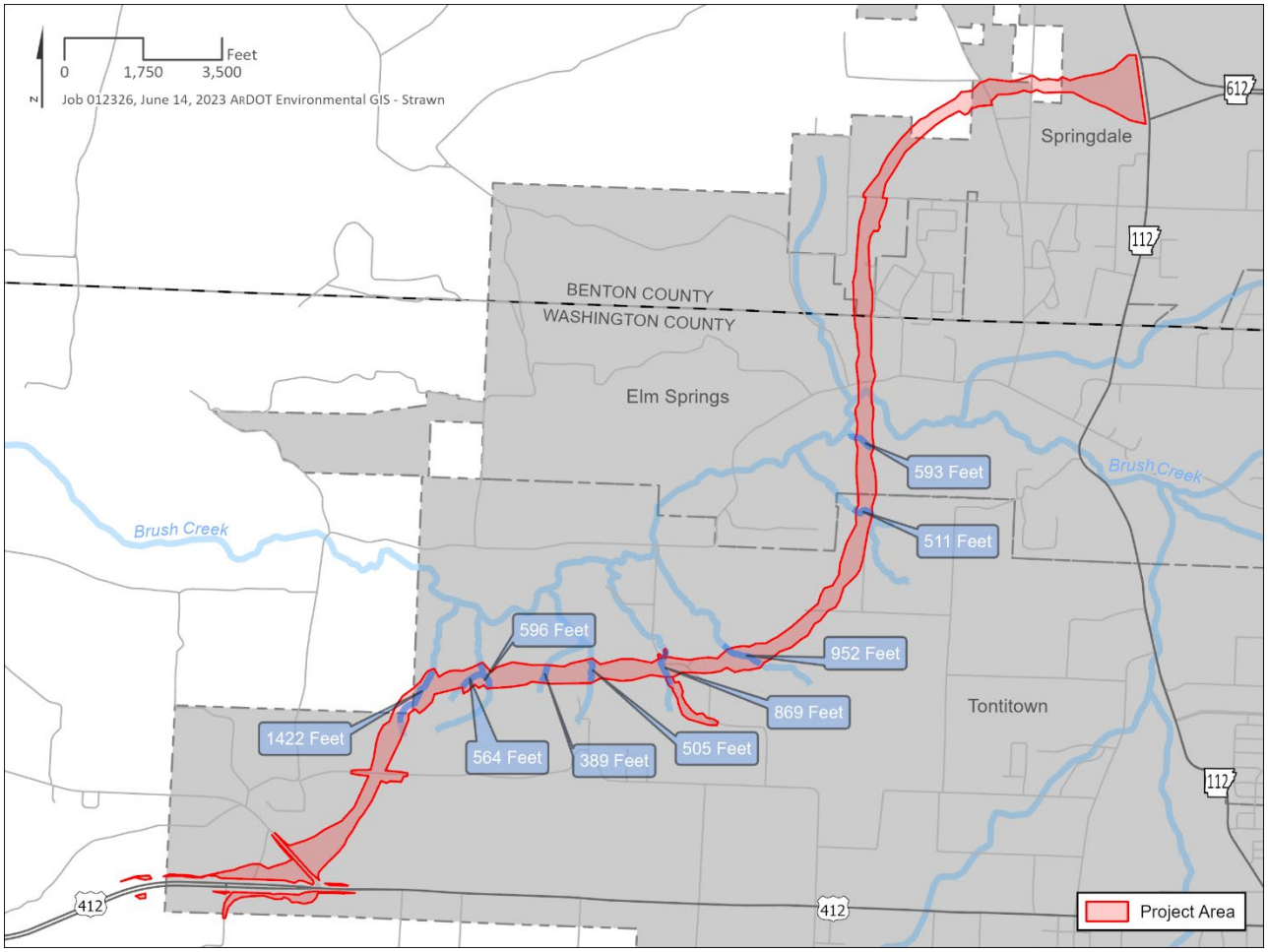


Figure 4

ARDOT will obtain a Standard Individual Section 404 permit due to impacts to Waters of the United States exceeding 0.1 acre. Stream impacts and required mitigation will be calculated using the 2011 Little Rock District Stream Method. Section 401 Water Quality Certification will also be obtained before construction begins.

Sediment and erosion control best practices would be used to prevent erosion and prevent sediment from leaving the construction site and entering streams. Retaining riparian vegetation and using filter socks between the areas under construction and any streams would aid in trapping sediment and limiting sediment-laden stormwater from reaching the streams. A Water Pollution Control Special Provision will be incorporated into the construction contract in order to minimize potential water quality impacts.

Where can I find more information about ARDOT sediment and erosion control best practices?
Any potential sediment-related impacts to streams and wetlands are mitigated by Section 110 of the *AHTD Standard Specifications, 2014 Edition*: Protection of Water Quality and Wetlands, the *ARDOT 2016 Erosion and Sediment Control Design and Construction Manual*, and the measures to be outlined in the Stormwater Pollution Prevention Plan required as part of the National Pollutant Discharge Elimination System Permit issued by the Arkansas Division of Environmental Quality.

Floodplains

The current design was reviewed to identify any encroachments into special flood hazard areas, also known as the 100-year floodplain, as shown on the Flood Insurance Rate Maps issued by the Federal Emergency Management Agency. Regulatory floodplains were mapped along Brush Creek, as seen on Figure 5. These floodplains were designated as Zones A and AE and have a 1% chance of flooding each year.

What is a floodplain?

Floodplains are land areas that become covered by water in a flood event. Special flood hazard areas, also known as 100-year floodplains, are areas that would be covered by a 100-year flood event. This is the floodplain commonly used for insurance and regulatory purposes.

The design within regulatory floodplains has not changed since the previous NEPA re-evaluations.

What is a flood event?

Specific flood events, such as a 25-year or 100-year flood event, involve flood waters covering the associated floodplain. A 100-year flood event has a 1% chance of occurring in any given year, a 50-year flood event has a 2% chance of occurring in any given year, and a 5-year flood event has a 20% chance of occurring in any given year.

Wetlands

No wetland impacts are anticipated with the current design.

What is a wetland?

Wetlands are areas typically inundated or saturated by surface or groundwater to the extent that they can support vegetation adapted for life in wet soil conditions.

Protected Waters

There are no state or federal protected water bodies within one mile of the current design.

Public Water Supplies

There are no public water supplies in or near the project area.

Floodplain Impacts

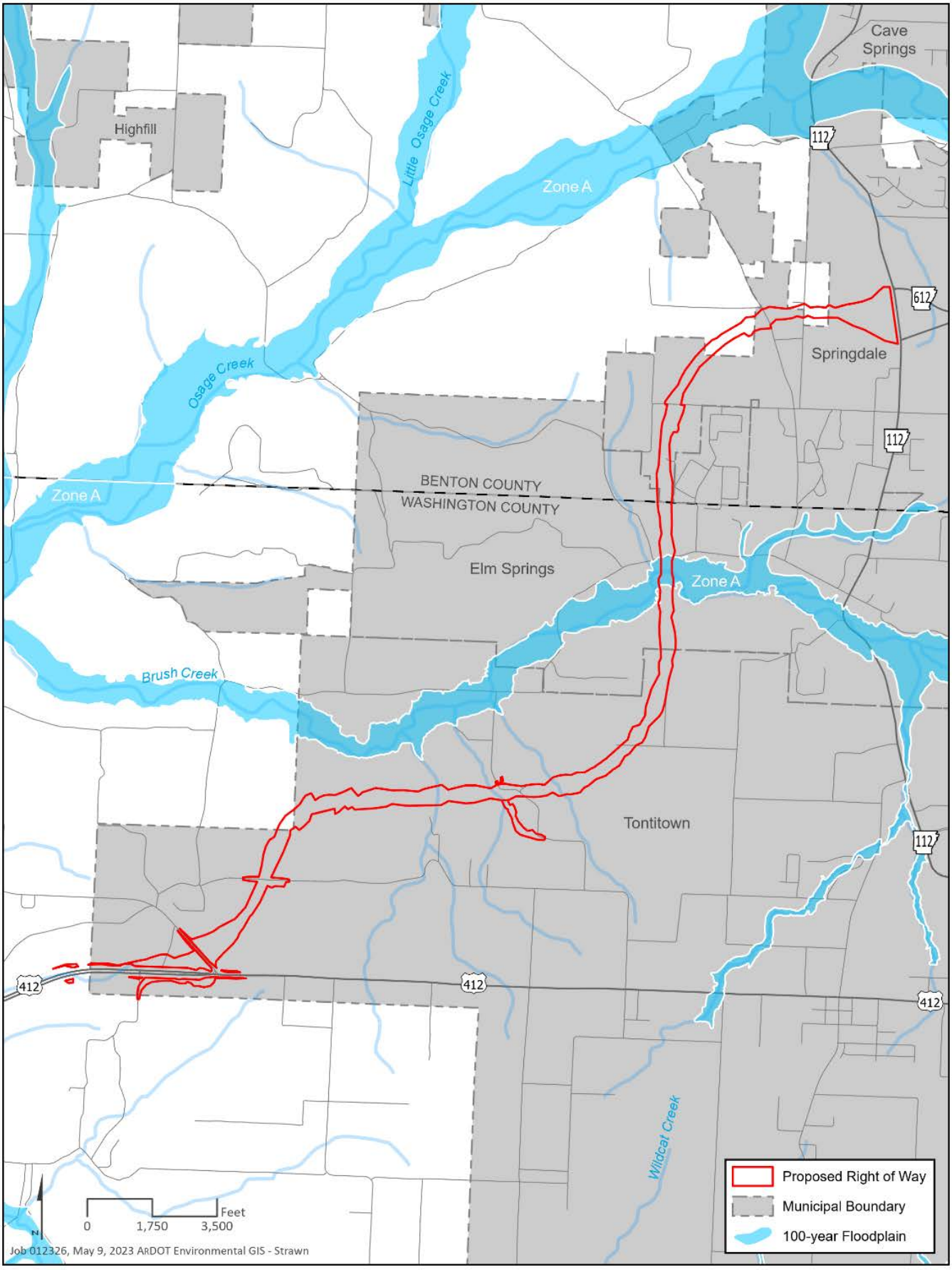


Figure 5

5.9 Would the project affect any federally-protected species?

The official species list obtained from the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation identified the following species as potentially occurring within the project area: Gray Bat (*Myotis grisescens*), Indiana Bat (*Myotis sodalis*), Northern Long-eared Bat (*Myotis septentrionalis*), Ozark Big-eared Bat (*Corynorhinus townsendii ingens*), Tricolored Bat (*Perimyotis subflavus*), Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*), Piping Plover (*Charadrius melodus*), Red Knot (*Calidris canutus rufa*), Alligator Snapping Turtle (*Macrochelys temmickii*), Ozark Cavefish (*Troglichthys rosae*), Neosho Mucket (*Lampsilis rafinesqueana*), Monarch Butterfly (*Danaus plexippus*), Benton County Cave Crayfish (*Cambarus aculabrum*), and Missouri bladderpod (*Physaria filiformis*).

The project is outside the scope of both the USFWS Arkansas Determination Key and the FHWA Programmatic Biological Opinion for Transportation Projects Within the Range of the Indiana Bat and Northern Long-eared Bat due to the size of the project. A survey was conducted for Indiana and Northern Long-eared Bats. It was determined that the project would have "no effect" on the Eastern Black Rail, Piping Plover, Red Knot, and Ozark Big-eared Bat. It was determined that the project "may affect, but is not likely to adversely affect" the Gray Bat, Indiana Bat, Northern Long-eared Bat, Neosho Mucket, Ozark Cavefish, Benton County Cave Crayfish, and Missouri bladderpod. The official species list and USFWS concurrence can be found in Appendix B.

The Cave Discovery Special Provision, Water Pollution Control Special Provision, and Off-site Restraining Condition for Indiana and Northern Long-eared Bats Special Provision will be added to the project contract to minimize impacts to threatened and endangered species.

The Monarch Butterfly is a candidate species and is not federally protected under the Endangered Species Act. USFWS recommends agencies implement conservation measures for candidate species in action areas as these species may warrant future protection under the Endangered Species Act. ARDOT will plant native wildflowers after construction as a conservation measure.

A "no effect" determination was made for the Alligator Snapping Turtle. This action would not jeopardize the continued existence of the Alligator Snapping Turtle and Tricolored Bat.

The design has not changed since the ROD or previous re-evaluations, and none of the federally-listed species are anticipated to experience impacts that would affect the decision-making for the project. The Red Knot, Eastern Black Rail, Northern Long-eared Bat, and Missouri bladderpod were not listed at the time of the 2014 NEPA re-evaluation, but none of the impacts described above would be considered significant or warrant additional analysis.

5.10 Does the project have any indirect impacts?

Indirect effects are reasonably foreseeable effects that may be caused by the project, but would occur in the future or outside of the project area.

Encroachment-Alteration Effects

Encroachment-alteration effects are physical, chemical, or biological changes in the environment that occur as a result of the project but are removed in time or distance from the direct effects. Impacts to water quality that occur as a result of the project but are then distributed off-site as water moves downstream beyond the project area, are the primary encroachment-alteration effects for this project. Best management practices would be utilized to eliminate or minimize impacts to water quality, as discussed in Section 5.8.

Induced-Growth Effects

Changes in the pattern of land use, growth patterns, population density, or growth rate due to the construction of a highway project also may occur, and the resulting induced development can impact sensitive resources. This is another type of indirect effect that is categorized as induced-growth effects.

The project area is already growing at a rate much faster than most of the rest of the State of Arkansas, as discussed in Section 3.1. This growth is anticipated to occur even if the proposed project is not implemented and was discussed in the FEIS, ROD, and previous re-evaluations. The project area is also already highly disturbed so further development would not introduce impacts to an area where they are not already occurring.

There have been no changes to the anticipated indirect effects that warrant additional analysis or that would affect the decision-making in the ROD or previous re-evaluations.

5.11 Does the project have any cumulative impacts?

Cumulative impacts result from the total effects of a proposed project when added to other past, present, and reasonably foreseeable future projects or actions. Cumulative impacts include the direct and indirect impacts of a project together with the reasonably foreseeable future actions of others: e.g., other federal, state, and local governments, non-governmental organizations, and private entities. The direct impacts that result from an action may be undetectable but can add to other disturbances and eventually lead to a measurable environmental change. Cumulative effects are studied so that the public, decision makers, and project proponents take the time to consider the "big picture" effects a project could have on the community and environment. For any given resource, a cumulative impact would only potentially exist if the resource were also directly or indirectly impacted by the proposed project.

The other actions discussed in the FEIS and their status are:

- Northwest Arkansas Regional Airport Access Road: Now called the Northwest Arkansas National Airport Access (XNA) connector project, this project had an Environmental Assessment approved by FHWA in January 2021 and a Finding of No Significant Impact approved by FHWA in June 2022. Both the XNA project and the westernmost section of the SNB are programmed for funding in the Arkansas Statewide Transportation Improvement Plan for year 2025. There have not been substantial changes to either project since the SNB ROD or previous re-evaluations.
- Eastern Fayetteville Bypass Corridor: As referenced in the FEIS, this project was removed from the City of Fayetteville's master street plan and was never constructed.
- Eastern Bypass to Rogers: Most of this corridor has already been built and is signed as Highway 265. Highway 265 currently extends from Highway 16 in Fayetteville to Highway 94 in Rogers.

Additional proposed actions currently in progress in or near the project area include:

- Highway 112: ARDOT has multiple projects in development to improve Highway 112 from south of Interstate 49 to Highway 12.

These projects would widen Highway 112 to four lanes with a raised median, curb and gutter, a sidewalk on one side of the highway, and a sidepath on the other side of the highway. The widening projects would mostly follow the existing Highway 112 alignment, with a few sections on new alignment to avoid existing development. The section of Highway 112 that crosses the SNB had an EA approved by FHWA on October 11, 2022. Final environmental clearances are expected soon.

The Highway 112 widening project and the XNA connector project did not identify any significant impacts to the environmental, including no significant cumulative impacts associated with either project. There have been no substantial changes to the cumulative effects analysis completed in the ROD that would affect the decision-making on the SNB project.

5.12 What other resource areas were examined but not impacted?

Air Quality

This project is located in an area that is designated as in attainment for all transportation pollutants. The current design would not result in air quality impacts for Clean Air Act criteria pollutants or special mobile source air toxics concerns substantially different than what was evaluated in the ROD or previous re-evaluations.

What is air quality attainment?

Areas are considered in attainment for air pollutants when measured levels are below the National Ambient Air Quality Standards set by the U.S. Environmental Protection Agency.

Hazardous Materials

No known hazardous materials sites or infrastructure would be impacted or generated by the current design.

What are hazardous materials?

A hazardous material is any item or chemical that can cause harm to people, plants, or animals when released into the environment.

Section 4(f)/6(f)

The project would not impact any parks, recreation areas, wildlife refuges, or historic sites eligible for protection under Section 4(f) of the U.S. Department of Transportation Act of 1966 or Section 6(f) of the Land and Water Conservation Act.

Chapter 6: Re-evaluation Conclusion

What's in Chapter 6?

Chapter 6 summarizes the findings of this re-evaluation.

6.1 What are the results of this re-evaluation?

The environmental analysis of the proposed project did not identify any substantial changes to the natural, cultural, or social environmental impacts since the ROD or previous re-evaluations. All previous decision-making on the SNB remains valid. A summary of the impacts associated with the current design can be found in Table 3.

Table 3

Impacts Associated with the Selected Alternative*

Resource	Anticipated Impacts
Project Length	6.6 miles
Construction Cost	$215M
Important Farmland Impacts	2.9 acres
Cultural Resources	1 NRHP-eligible site
Total Stream Impacts	6,401 linear feet
Federally-Protected Species	"No Effect" or "May Affect, Not Likely to Adversely Affect" findings for all species

*Does not include impacts within the footprint of the XNA connector interchange, which was evaluated under that project's EA and FONSI.

Reference Page: Acronyms

ARDOT	Arkansas Department of Transportation
EA	Environmental Assessment
FEIS	Final Environmental Impact Statement
FONSI	Finding of No Significant Impact
FHWA	Federal Highway Administration
MOA	Memorandum of Agreement
MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act
NRCS	U.S. Department of Agriculture – Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWARPC	Northwest Arkansas Regional Planning Commission
PEL	Planning and Environmental Linkages
ROD	Record of Decision
SHPO	State Historic Preservation Officer
SNB	Springdale Northern Bypass
USFWS	U.S. Fish & Wildlife Service
XNA	Northwest Arkansas National Airport

Appendix A: Cultural Resources MOA

Appendix A is referenced in:

- Section 5.7

MEMORANDUM OF AGREEMENT
AMONG
THE FEDERAL HIGHWAY ADMINISTRATION,
THE ARKANSAS STATE HISTORIC PRESERVATION OFFICER, THE ARKANSAS DEPARTMENT OF TRANSPORTATION, AND
THE OSAGE NATION
REGARDING
ARDOT JOB 012326
HWY. 412 – HWY. 112 (Springdale Bypass) (F)
BENTON & WASHINGTON COUNTIES, ARKANSAS
SITE 3WA1444

WHEREAS, the Federal Highway Administration (FHWA) and the Arkansas Department of Transportation (ARDOT) plan to carry out Job 012326, which is a federal undertaking as defined under 36 CFR § 800.16(y); and

WHEREAS, the undertaking consists of providing a 6.56-mile section of a fully controlled connection between Highway 412 and the interchange of Highway 612 and the XNA Connector in order to improve safety, congestion, and reliability through northern Washington County and southern Benton County; and

WHEREAS, the FHWA has defined the undertaking's area of potential effects (APE) as the proposed right-of-way acquired for the construction of the new location road; and

WHEREAS, the Arkansas FHWA Division Administrator is the "Agency Official" responsible for ensuring that the Program in Arkansas complies with Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA) (54 U.S.C. § 306108), and codified in its implementing regulations, 36 *Code of Federal Regulations* (CFR) Part 800, as amended; and

WHEREAS, ARDOT administers Federal-aid projects throughout Arkansas as authorized by Title 23 U.S.C 302; and

WHEREAS, the responsibilities of the Arkansas State Historic Preservation Officer (SHPO) under Section 106 of the NHPA and 36 CFR Part 800 are to advise, assist, review, and consult with federal agencies as they carry out their historic preservation responsibilities; and

WHEREAS, ARDOT and the SHPO have determined that site 3WA1444, is eligible under Criterion D (research potential) and that the successful implementation and completion of Appendix A, the attached Treatment Plan, will resolve the adverse effect finding through data recovery; and

WHEREAS, FHWA has consulted with the Osage Nation, the Caddo Nation, Shawnee Tribe, and the United Keetoowah Band of Cherokee Indians in Oklahoma (Tribes), regarding the effects of the undertaking on historic properties of religious or cultural significance; and

WHEREAS, FHWA, pursuant to 36 CFR § 800.6 (c)(2)(ii), has invited the Tribes to enter into this MOA as Invited Signatories; and

WHEREAS, the Osage Nation accepted the invitation and will participate in the MOA as an Invited Signatory; and

WHEREAS, the Caddo Nation declined the invitation, and the Shawnee Tribe and the United Keetoowah Band of Cherokee Indians in Oklahoma have not responded; and

WHEREAS, in accordance with 36 CFR § 800.6(a)(1), FHWA has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect determination with specified documentation, and the ACHP has chosen *not to* participate in the consultation pursuant to 36 CFR § 800.6(a)(1)(iii); and

WHEREAS, the definitions set forth in 36 CFR Part 800 are applicable throughout this MOA.

NOW, THEREFORE, FHWA, SHPO, ARDOT, and the Osage Nation agree that the undertaking shall be implemented in accordance with the following stipulations in order to take into account the effect of the undertaking on the historic property.

STIPULATIONS

The FHWA, through ARDOT, will ensure that the following measures are carried out.

I. MITIGATION OF ADVERSE EFFECT TO THE HISTORIC PROPERTY: (Site 3WA1444)

A. ARDOT will ensure that all stages of the field investigation, laboratory work, analysis, and report preparation comply with the *Secretary of the Interior's "Standards and Guidelines for Archeology and Historic Preservation" (48FR44716)* and those standards set forth in Appendix B of the State Plan (Early et al. 2010).

B. ARDOT will ensure that the selected contractor, WSP Environment & Infrastructure, Inc. (WSP) implements all provisions, stipulations, techniques, methods, analyses, interpretation, and documentation called for in the attached Treatment Plan (Appendix A).

C. ARDOT will ensure that the excavation site boundaries are determined and recorded with GPS coordinates. Statements regarding the potential significance of any site remnants outside of the APE will be included in the final report and added to the site files to ensure that any future projects that may affect the site can be properly addressed. Sensitive locational data that would divulge the specific location of the site will not be included in the final report; however, will be made available only to those parties specified below in Stipulation I.F.

D. ARDOT, in consultation with the SHPO, will ensure that all artifact collections (prehistoric ceramics and lithics, and historic artifacts) and their supporting documentation are curated at the University of Arkansas Collections Facility (UACF) in Fayetteville, Arkansas. If necessary, all human remains and grave goods will be curated separately from the site collections at UACF in a secure location until determination of proper custody and disposition. All collections and documents will meet the Curation Standards set forth in 36 CFR Part 79 and in Appendix B of the State Plan (Early et al. 2010). Human remains and funerary objects or other items from sacred contexts are exempt from such standards.

E. ARDOT will ensure that regular progress reports and copies of the final report are provided to the Signatories and Invited Signatories.

F. Precise location data will only be provided to ARDOT, the Tribes, the SHPO, and the Arkansas Archeological Survey in a separate attachment to the report and shall otherwise be withheld from disclosure pursuant to Section 304 of the NHPA, Executive Order 13007, and other applicable authorities.

II. HUMAN REMAINS

Human remains are not expected to be discovered on this undertaking; however, if they are encountered during implementation of the project, all activity within a one hundred (100) meter radius buffer zone of the discovery shall cease. The treatment of human remains shall follow the guidelines developed for the *Arkansas Burial Law* (Act 753 of 1991, as amended) and the ACHP's *Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects* published February 23, 2007. As such, a permit will be obtained from the Arkansas Historic Preservation Program prior to the excavation of any remains.

A. If human remains are discovered, whether during archeological investigations or project construction, the applicant will temporarily suspend all activities within a one hundred (100) meter-radius buffer zone that could disturb the remains or any grave associated objects. Vehicle traffic within the buffer zone will be limited to that necessary to remove vehicles and equipment from the buffer zone. The remains will be left as found, covered with natural fabric tarp, and measures will be made to safeguard the find until the proper authorities can be identified.

B. ARDOT shall immediately contact SHPO and the appropriate law enforcement agency as required in Arkansas law.

C. If law enforcement determines that the find is not a crime scene, the ARDOT, SHPO, federally-recognized Tribes, and other interested parties will consult as per the guidelines of the Arkansas Burial Law (Act 753 of 1991, as amended) and the ACHP's "Policy Statement Regarding the Treatment of Burial Sites, Human Remains, and Funerary Objects" published February 23, 2007.

D. FHWA, ARDOT, and SHPO will consult with the federally-recognized Tribes regarding any proposed treatment and final disposition of the human remains and/or funerary objects. It is the preference of the Tribes that, wherever possible, burials are left in place and any further project activities avoid the burial with an appropriate buffer area, to be determined in consultation on a case-by-case basis.

III. PROFESSIONAL QUALIFICATION STANDARDS

The FHWA shall ensure that all archeological investigations to this MOA are carried out by, or under the direct in-field supervision of, a person or

persons meeting the appropriate qualifications set forth in the Secretary of the Interior's professional qualification standards (48 CFR 44739). In addition, both the Principal Investigator and any supervising archeologists will meet the professional qualification requirements for certification in the Register of Professional Archaeologists and follow the *Code of Conduct* and *Standards for Research and Performance*.

IV. POST-REVIEW DISCOVERY SITUATIONS

Pursuant to 36 CFR Part 800.13, if cultural material is discovered during implementation of the project, the FHWA shall ensure that all construction activities cease in the area of the discovery and the consulting parties are notified. The FHWA, in consultation with SHPO and the Tribes, shall determine if the discovery is eligible for inclusion in the NRHP, unless it is associated with site 3WA1444. Then, it will be assumed eligible and may warrant further analysis and consideration of effects in consultation with SHPO and the Tribes. If the discovery is not associated with site 3WA1444 and is considered eligible, the FHWA and the ARDOT will develop a treatment plan for the historic property, which shall be reviewed by SHPO and the Tribes. Disputes arising from such review shall be resolved in accordance with Stipulation V.

V. DISPUTE RESOLUTION

A. Should the SHPO or any consulting party object within thirty (30) calendar days to any findings, proposed actions or determinations made pursuant to this MOA, the FHWA shall consult with the objecting party to resolve the objection. If the FHWA determines that the objection cannot be resolved, it shall request further comments from ACHP pursuant to 36 CFR Part 800.7. Any ACHP comment provided in response to such a request shall be taken into account by the FHWA in accordance with 36 CFR 800.7 with reference only to the subject of the dispute. Prior to reaching a final decision on the dispute, FHWA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, Signatories, and Invited Signatory, and provide them with a copy of this written response.

B. If the ACHP does not provide its advice regarding the dispute within the thirty (30)-calendar day period, FHWA may make the final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, FHWA shall prepare a written response that takes into

account any timely comments regarding the dispute from the Signatories and Invited Signatory to the MOA, and provide them and the ACHP with a copy of such written response; therefore, notifying the consulting parties of its final decision. FHWA shall then proceed according to its final decision. The FHWA's responsibility to carry out all actions under this MOA that are not subject to dispute shall remain unchanged.

VI. MONITORING

The consulting parties or one or more consulting parties in cooperation may monitor the undertaking and stipulations carried out pursuant to this MOA.

VII. AMENDMENTS

Should any of the Signatories or Invited Signatories to this MOA believe that the terms of this MOA are not being met or cannot be met, that party shall immediately notify the other signatories and request consultation to amend this MOA in accordance with 36 CFR Part 800. The process to amend this MOA shall be conducted in a manner similar to that leading to the execution of this MOA.

VIII. TERMINATION

Any Signatories or Invited Signatories to this MOA may terminate it by providing a thirty (30) calendar days-notice to the other parties provided that the parties shall consult during the period prior to termination to seek agreement on amendments or other actions that would avoid termination of this MOA. In the event of termination, the FHWA shall comply with 36 CFR Part 800.4 through 800.6 with regard to the undertaking covered by this MOA.

IX. DURATION

This MOA will expire if its terms are not carried out within five (5) years from the date of its execution. Prior to such time, the FHWA may consult with the other Signatories and Invited Signatory to reconsider the terms of the MOA and amend it in accordance with Stipulation VII.

X. FULFILLMENT OF SECTION 106 RESPONSIBILITIES

Execution of this MOA and Treatment Plan and implementation of its terms evidences that the FHWA has taken into account the effect of the undertaking on archeological site 3WA1444 and has fulfilled its Section 106 responsibilities under the NHPA of 1966, as amended.

ARDOT Job 012326
Memorandum of Agreement
Page 8 of 11

Signatory

FEDERAL HIGHWAY ADMINISTRATION

Vivien N. Hoang, P.E.
Arkansas Division Administrator

8/7/2023
Date

ARDOT Job 012326
Memorandum of Agreement
Page 9 of 11

Signatory

ARKANSAS STATE HISTORIC PRESERVATION OFFICER

Director Scott Kaufman
Arkansas State Historic Preservation Officer

6-19-23
Date

ARDOT JOB 012326
Memorandum of Agreement
Page 10 of 11

Signatory

ARKANSAS DEPARTMENT OF TRANSPORTATION

Lorie H. Tudor

8/3/23

Lorie H. Tudor, P. E.
Director

Date

JDW

ARDOT Job 012326
Memorandum of Agreement
Page 11 of 11

Invited Signatory

THE OSAGE NATION

Geoffrey M. Standing Bear
Principal Chief

8-1-2023
Date

Treatment Plan for NRHP-Eligible Site 3WA1444 in Washington County, Arkansas (Springdale Northern Bypass [ARDOT Job 001966])

WSP E&I Project No.: 7361211295
WSP E&I Cultural Report of Investigations No.: 23-024
Arkansas Dept. of Transportation Job No. 001966

Lead Federal Agency: Federal Highway Administration

Prepared for:
Kristina U. Boykin
Section Head, Cultural Resources
Arkansas Department of Transportation
10324 Interstate 30
Little Rock, Arkansas 72209

Prepared by:
WSP USA Environment & Infrastructure, Inc.
11003 Bluegrass Parkway #690
Louisville, Kentucky 40299
(502) 267-0700

May 2023

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Treatment Plan for NRHP-Eligible Site 3WA1444 in Washington County, Arkansas (Springdale Northern Bypass [ARDOT Job 001966])

WSP E&I Project No.: 7361211295
WSP E&I Cultural Report of Investigations No.: 23-024
Arkansas Dept. of Transportation Job No. 001966

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Little Rock, Arkansas 72209

Prepared by:
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Louisville, Kentucky 40299
Phone: 502-267-0700

Thaddeus G. Bissett, PhD, RPA
Principal Investigator

May 2023

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1.0 INTRODUCTION

Site 3WA1444 is located partially within the right-of-way ("project ROW" or "ROW") of Arkansas Department of Transportation (ARDOT) Job 001966, Springdale Bypass (**Figure 1**), which will "provide a bypass of heavily traveled routes through Springdale, Arkansas, utilizing a four-lane, divided, fully controlled access cross-section" (FHWA-AR 2006:1-1). From March 16 -22, 2021, WSP USA Environment & Infrastructure, Inc. (WSP [formerly Wood Environment & Infrastructure Solutions, Inc.]) conducted Phase II archaeological significance evaluations at three sites within or partially within the project ROW in order to assess their eligibility for the National Register of Historic Places (NRHP) (Stallings and Bissett 2021). The work was conducted in compliance with Public Law 89-665, the National Historic Preservation Act of 1966 (as amended), 54 U.S.C. 300101 et seq.) and Presidential Executive Order 11593. The project complied with established guidelines for field investigations and NRHP assessment according to the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation (Federal Register, Vol. 48, No. 190), prepared by the National Park Service, Department of the Interior (1983), and with the standards of the Arkansas Archeological Survey (ARAS), Appendix B of the Arkansas State Plan: Guidelines for Archaeological Fieldwork and Report Writing in Arkansas (Early et al. 2010) and Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation.

Based on the results of the Phase II investigation (Stallings and Bissett 2021), WSP recommended that Site 3WA1444 is eligible for the NRHP under Criterion D (potential to provide information important in prehistory or history). WSP further recommended that if ARDOT was unable to avoid the site during the proposed highway construction and related work, an archaeological data recovery (Phase III) excavation should be conducted to mitigate portions of the site within the ROW that would be adversely impacted by proposed construction. In a letter dated September 7, 2021, the Arkansas Historic Preservation Program (AHPP) concurred with WSP's recommendations.

Site 3WA1444 is situated on a stream terrace on the south side of Brush Creek in Washington County, Arkansas. Phase II investigations revealed that portions of the site within the ROW contain undisturbed archaeological deposits associated with one or more Pre-Contact occupations (**Figure 2**) (Stallings and Bissett 2021:10-12). Cultural deposits consisted of a moderately dense assemblage of Pre-Contact lithic artifacts (primarily manufacturing debris) extending into the local subsoil at depths of up to 70 centimeters below surface (cmbs). An intact rock-filled feature was encountered in one unit between 30 and 50 cmbs, and its presence suggests—in combination with the vertical distribution of artifacts at the site—that additional intact features may be present. Temporally diagnostic hafted bifaces at the site included Early Archaic, Middle Archaic, Middle Woodland, and Late Woodland / Mississippian forms (ca. 9500 to 680 calendar [cal] yr BP).

Proposed construction activities associated with Job 001966 will adversely affect the portion of Site 3WA1444 located within the project ROW. At the request of ARDOT, the following document outlines a detailed archaeological treatment plan for Site 3WA1444. The proposed plan is informed by the results of WSP's Phase II testing at the site in March of 2021, which indicated that 3WA1444 comprises an intact multi-component Pre-Contact occupational site (i.e., "open habitation") containing the remains of a variety of cultural activities, including chipped stone tool manufacture and maintenance.

The treatment plan developed by WSP for Site 3WA1444 is oriented toward addressing a range of questions about the Pre-Contact occupation of the local landscape of northwestern Arkansas. Based on results of the Phase II investigation, the site potentially contains information relevant to addressing significant questions about culture change during two

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major periods. During the Early and Middle Archaic, human populations in the region were still settling into the changing post-Pleistocene environment and developing new adaptive strategies. The development of those strategies is evident in later populations' cultural practices and activities. By the Woodland period, as local environments became increasingly stable and more similar to modern conditions, indigenous North American peoples had already begun domesticating a number of local plant species, the cultivation of which helped to support the establishment of more permanent and sedentary communities and, gradually, larger, fully sedentary agriculturalist populations in the late Pre-Contact era. Site 3WA1444 has the potential to provide critical new information about the history of the Pre-Contact people and cultures of the region during these critical periods.

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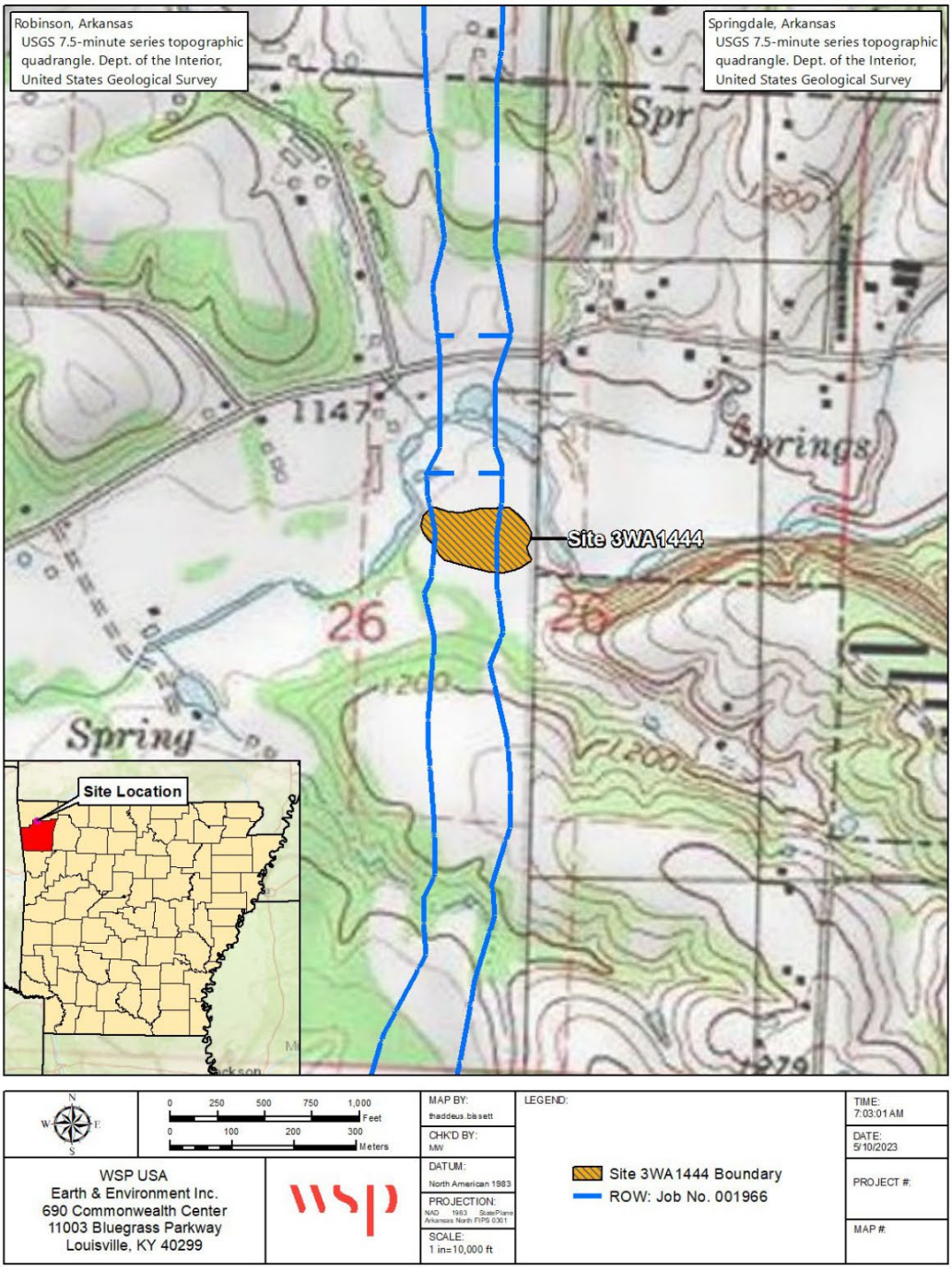

Figure 1. Location of Site 3WA1444 within the ROW for ARDOT Job 001966, Washington County, Arkansas.

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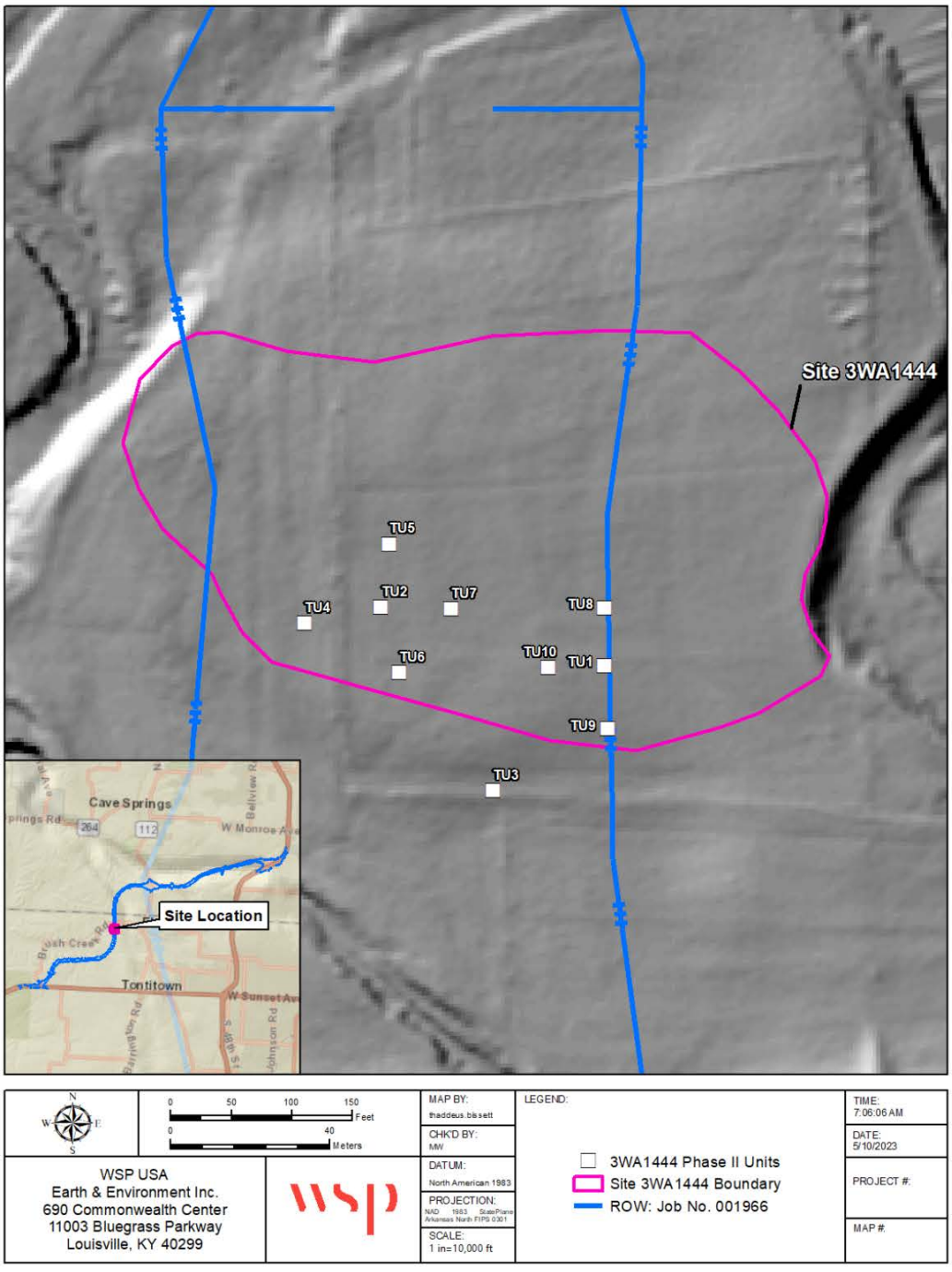

Figure 2. Site 3WA1444 within the project ROW on a hillshaded basemap of the local terrain.

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2.0 PROJECT BACKGROUND AND PREVIOUS INVESTIGATIONS

ARDOT proposes to construct a bypass of existing Highway 412 through Springdale, Arkansas. In 2009, Spears Professional Environmental Archeological Research Service, Inc. (SPEARS) conducted a Phase I archaeological survey of nearly all of the proposed project ROW, except areas where landowner permission could not be obtained. The purpose of the survey was to identify archaeological sites within or adjacent to the proposed ROW, to determine potential impacts of the proposed project to any archaeological sites located during the survey, and to make recommendations regarding the need for additional archaeological fieldwork at any of the sites identified. Archaeological survey of the ROW resulted in the identification of 30 archaeological sites, including Site 3WA1444.

The survey report for Site 3WA1444 characterized the site as "a large Pre-Contact camp or village located on a second terrace of a creek" (Zabecki et al. 2009:81). Two diagnostic artifacts at the site were identified as possible Late Archaic forms, and abundant lithic debitage and tool fragments (n = 131) representing two principal chert types were recovered from nearly 50 percent of the shovel test probes (STPs) excavated during the survey, with artifacts found as deep as 53 cmbs. On the basis of the abundance and depth of material, and on the variety of artifacts recovered, the investigators recommended that the site was potentially eligible for the NRHP (Zabecki et al. 2009:81-84).

At ARDOT's request, WSP conducted an NRHP eligibility assessment of the site in mid-March of 2021.

2.1 Summary of Phase II Investigations at 3WA1444

Site 3WA1444 encompasses approximately 14,596 square meters (sq m) (3.6 acres [ac]) and is situated on the upper terrace south of Brush Creek, roughly 110 m (330 ft) south of the creek. It is nearly 250 m (820 feet) south-southeast of the intersection of Water Street and Downum Road (see **Figure 1**). Site 3WA1444 is located in an active livestock pasture. During the Phase II investigation, ground cover consisted only of low pasture grasses (**Figures 3 and 4**).

Figure 3. Overview of 3WA1444 to the north from near the west edge of the project ROW.

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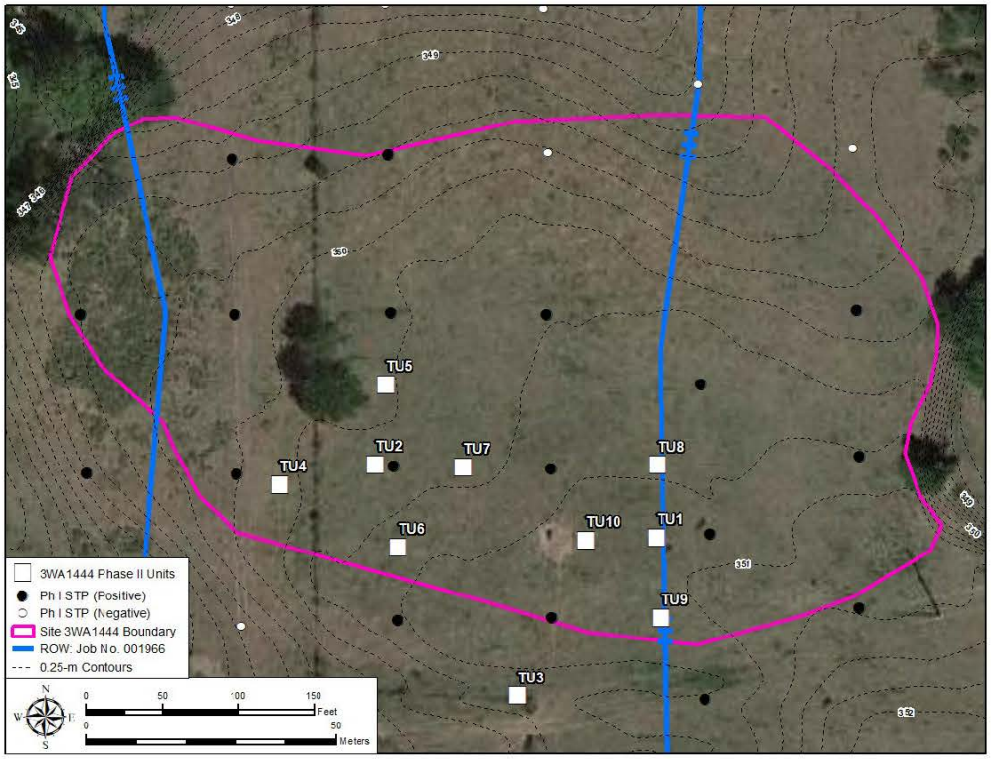

Figure 4. Distribution of Phase II 1-x-1 m test units and Phase I STPs within project ROW at 3WA1444.

2.2 Results of the Phase II Investigation

The Phase II investigation at 3WA1444 consisted of hand-excavation of ten 1-x-1 m test units and one 50-x-50-cm extension off one unit (10.25 sq m), distributed over the southern-central portion of the site, which had produced the highest density of cultural material during the initial survey (see **Figure 4**). Out of the 3.6 ac, only 2.6 ac is located within the project ROW.

Test Units 1 and 2 were placed initially in areas where STPs had contained appreciably high quantities of cultural material (Stallings and Bissett 2021:11). Unit 3 was positioned between several other relatively high-yielding STPs. The remaining seven test units were positioned at 15-m intervals from Units 1 and 2 to determine the extent and integrity of subsurface cultural deposits that were first noted in Units 1 and 2. The 50-x-50 cm extension was placed north of Unit 8 to more fully expose a cultural feature (see below).

Unit soil profiles revealed a plow zone (Zone I) at the site that extended to an average depth of between 25 and 30 cmbs (**Figure 5**), although it appeared as deep as 60 cm deep in Test Unit 3, below which rock density increased markedly (**Figure 6**). Zone I was generally a dark yellowish brown sandy loam with varying quantities of small gravels.

Zone II was the local subsoil (see **Figure 5**) and showed little evidence of disturbance. In most units, Zone II was a moderately lighter dark yellowish brown sandy clay loam. Not including the transition between Zone I and Zone II, which occurred between 25 and 30 cmbs in the excavated units (with the exception of TU 3), Zone II extended to the base of excavations

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between 70 and 80 cmbs. The rocky composition of deeper levels in TU 3 suggests that Zone II is underlain by a more extensive rock layer, but it was not encountered in other units at the site.

Figure 5. Profile of Unit 1.

Figure 6. Profile of Unit 3.

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No test unit was entirely culturally sterile, but two units—Unit 4, west of Unit 2, and Unit 3, south of the main grouping of test units—contained the fewest materials overall (see **Figure 4**). The largest quantities of cultural material were found in Units 1 and 2 (**Table 1**), and units excavated at roughly 15-m intervals around those units contained relatively large amounts of cultural material, defining two areas centered on Units 1 (Area 1) and 2 (Area 2).

Cultural materials were present in both stratigraphic zones. In total, 3,678 artifacts were recovered in the ten units, with approximately 80.7 percent (n = 2,968) in Zone I and 19.3 percent (n = 710) in Zone II (see **Table 1**). Although the greater proportion of the site assemblage occurred in Zone I, the underlying Zone II—representing the intact portion of the site—contained a significant amount of material as well.

Table 1. Cultural Material Distribution by Unit and Zone.

Area	Test Unit	Artifacts Recovered					
		Zone I		Zone II		TOTAL	
		Count	% of Unit Ct.	Count	% of Unit Ct.	Count	% of Site Total
1	1	555	65.7%	290	34.3%	845	23.0%
	8	253	90.4%	27	9.6%	280	7.6%
	9	215	83.0%	44	17.0%	259	7.0%
	10	222	72.1%	86	27.9%	308	8.4%
Area 1 Totals		**1245**	**73.6%**	**447**	**26.4%**	**1692**	**Area 1: 46% of Site Total**
2	2	596	86.4%	94	13.6%	690	18.8%
	4	79	64.2%	44	35.8%	123	3.3%
	5	426	88.2%	57	11.8%	483	13.1%
	6	225	83.6%	44	16.4%	269	7.3%
	7	216	94.3%	13	5.7%	229	6.2%
Area 2 Totals		**1542**	**86.0%**	**252**	**14.0%**	**1794**	**Area 2: 49% of Site Total**
-	3	181	94.3%	11	5.7%	192	**TU 3: 5% of Site Total**
TOTALS		**2968**	**80.7%**	**710**	**19.3%**		**3678**

Artifacts consisted predominately of chipped stone debitage, but seven diagnostic hafted bifaces were also recovered in Units 1, 2, 5, and 6 (**Figure 7**). Units 1 and 6 each produced a possible Late Woodland Rice Side-Notched (Ray 2016:77-79). Unit 2 yielded three diagnostics: an Early Archaic Rice Lobed (Ray 2016:104-106), a possible Middle-Late Woodland Steuben stemmed (Ray 2016:121-122), and a hafted biface stem that may represent a Snyders Middle Woodland type (Ray 2016:33-35). Unit 5 contained a Big Creek Late Archaic (Ray 2016:46; see also Morse 1970:21) and a Middle Archaic Jakie (Ray 2016:98-100). These diagnostics represent a variety of time periods, but they predominately cluster within the Late Archaic through Late Woodland periods. This assessment is generally in agreement with, but expands upon, the findings of the Phase I survey, which suggested the site contained primarily a Late Archaic component (Zabecki et al. 2009:84).

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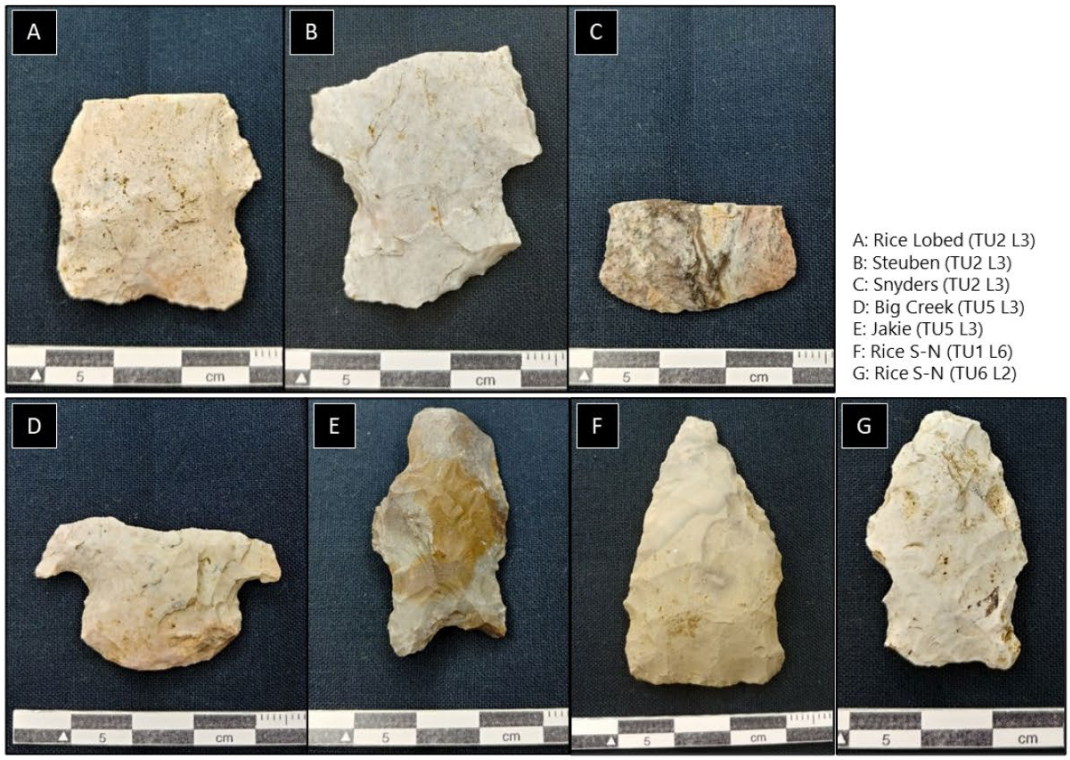

Figure 7. Diagnostic hafted bifaces recovered at Site 3WA1444 during NRHP testing.

The Phase II investigation also documented an intact cultural feature—a rock-filled pit—below the plow zone in Unit 8 (**Figure 8**). The feature was identified mainly from the concentration and configuration of the rock, since no sign of differently-colored soil could be discerned. A flake and a fragment of charcoal were observed during removal of a portion of the feature fill for later flotation analysis.

Figure 8. Rock-filled feature identified in profile of Test Unit 8 (facing west).

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Summary of Phase II Investigations

Phase II testing conducted at Site 3WA1444 consisted of 10 1-x-1 m test units distributed over an area roughly 80 m east-west by 60 m north-south within ARDOT's ROW for Job 001966 south of Brush Creek. The investigation indicated that abundant Pre-Contact cultural material is present at the site, representing a possible open habitation (base camp) occupied or used predominately from the Late Archaic through the Middle or Late Woodland periods. Although an appreciable amount of the site assemblage was contained within what appeared to be a disturbed plow zone (Zone I), cultural material was recovered in appreciable numbers in the deeper, intact soils below the plow zone, extending to depths of up to 70 cmbs. The presence of an intact cultural feature further supports the interpretation that 3WA1444 contains intact Pre-Contact archaeological deposits.

Based on the relative numbers of artifacts recovered the units, as illustrated in **Figure 9**, at least two activity areas are represented within the excavated portion of the site. These areas are concentrated around Units 1 and 2, but additional loci contiguous with—or separate from—these areas may also be present. Due to the density and localized nature of the artifact assemblage at Site 3WA1444, and evidence for intact deposits, including one cultural feature, WSP recommended the tested area of the site to have strong potential to yield additional important information about Pre-Contact occupation and human activity in the Late Archaic and Woodland Periods on the local and regional landscape in Washington County, and thus eligible for the NRHP under Criterion D ("Information potential").

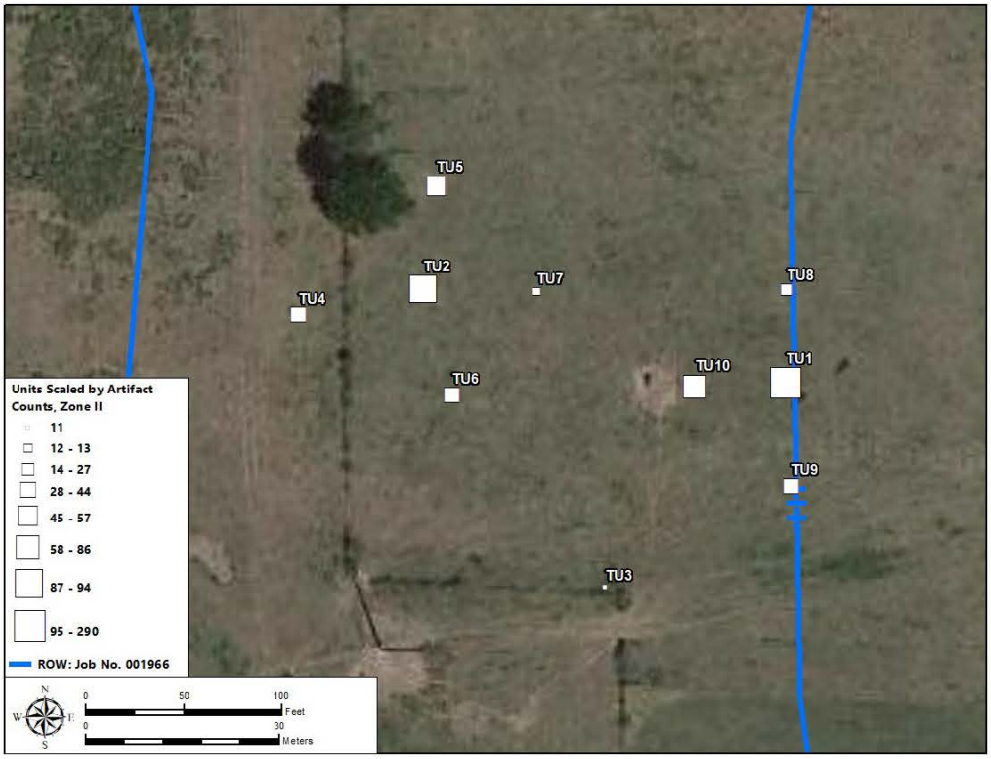

Figure 9. Phase II test units shown as scaled symbols. Scale indicates relative proportion of artifacts in Zone II (intact sub-plow zone context).

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3.0 RESEARCH DESIGN FOR SITE 3WA1444

The remainder of this document presents a detailed research design and treatment (data recovery) plan for Phase III mitigation of Site 3WA1444. The plan is informed by the results of WSP's Phase II investigations of the site, as well as data provided from the original Phase I archaeological survey (Zabecki et al. 2009). These reports collectively provide detailed information about the potential of the archaeological materials preserved at the site to address a broad range of questions about the Pre-Contact Native American peoples who occupied and used the site during its history. These research questions can be grouped into several general themes.

3.1 Organization of Technological Systems

Cultural materials recovered at Site 3WA1444 during both Phase I and Phase II investigations comprised the remains of chipped stone tool manufacture and use: lithic debitage and tool fragments. Zabecki et al. (2009:Table 17) noted only two chert types among the materials recovered during Phase I survey, with the bulk of the material (92 percent) classified as Keokuk chert. The remainder was identified as Reeds Spring. Both chert types are geologically local to the region, and the material types derive their names from eponymous Early Mississippian formations of interbedded limestone and chert (Simms et al. 1995).

Site 3WA1444 produced a sizable lithic assemblage during the Phase II investigation, and based on the number of lithic artifacts recovered only within 10 sq m of the site, a more extensive data recovery excavation is anticipated to produce appreciable quantities of Pre-Contact lithic artifacts. Extensive single-site lithic assemblages are especially well suited to addressing questions about the manner in which Pre-Contact Native American peoples procured and processed lithic raw material into a wide range of different tools, and the ways in which communities were organized and sited on the local and regional landscape to take advantage of proximity to locations where lithic resources could be accessed.

During the data recovery, the opportunity to fully expose large areas of the site will also allow for the collection of high-resolution spatial data for lithic artifacts that can help to identify and document individual activity areas within the site, including those of different lithic reduction and utilization activities within each location. If appropriately placed, Phase III data recovery excavation blocks can capture a significant amount of the total horizontal and vertical artifact distributional variability within the site. High-resolution artifact locational data will enable mapping of relatively minor differences in artifact densities, including the locations of lithic tools and tool manufacturing debris. Such information can be used to address specific questions about the patterning of lithic resource use.

3.2 Regional Interaction and Exchange Systems

Results from multiple investigations of Site 3WA1444 suggest that the site was occupied and used predominately from the Late Archaic through the Late Woodland. Research in the recent decades has demonstrated that Native peoples in eastern North America had, by the Late Archaic period, established extensive exchange and interaction networks spanning large geographic areas (e.g., Johnson (ed.) 1994). Local participation in such networks is usually visible in the archaeological record as non-local lithic raw materials, and non-local plant and animal remains, including domesticated species such as tobacco (a South American domesticate that has recently been identified in transitional Archaic context in central Arkansas [Bissett et al. 2020]).

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As noted above, two principal types of lithic raw material—Keokuk and Reeds Spring chert—are geologically local to the region. Evidence from Site 3WA1444 indicates that these two chert types represent the primary lithic raw materials used at the site, suggesting that the occupants may not have gone to great lengths to acquire non-local ("exotic") lithic materials.

Analysis of the lithic materials recovered during the Phase II investigation has not been completed, and so it is not yet known if non-local lithic materials may be represented within the assemblage. However, the recovery and analysis of a larger and more spatially extensive assemblage from the site may result in the identification of lithic tools or debris with more distant geological sources, providing evidence of interaction between the people occupying 3WA1444 and those sources, either through direct procurement or through participation in local or regional networks of exchange and interaction.

In addition to exotic lithic raw material, 3WA1444 may contain evidence of participation in Late Archaic and Woodland-period networks of exchange through which locally-domesticated plants were distributed across much of eastern North America, as well as from regions to the south (e.g., tobacco). If the site contains additional intact cultural features, such features may contain the carbonized remains of such plant species, demonstrating potential long-distance interaction between the occupants of Site 3WA1444 and indigenous Americans elsewhere.

3.3 Local and Regional Chronology and Culture History

The construction and refinement of local and regional cultural chronologies remains an essential and critical task in modern archaeological research. Archaeological sites such as 3WA1444, containing evidence of occupation and use over multiple periods, provide the opportunity to recover temporally diagnostic artifacts from stratified, datable contexts. Temporally diagnostic hafted bifaces recovered during the Phase II investigation of 3WA1444 indicated that the site may contain cultural components ranging from the Middle Archaic through the Late Woodland periods, although likely was most extensively used from the Late Archaic through the Middle to Late Woodland. Nevertheless, while some of the diagnostics recovered at the site derived from disturbed (plow zone) contexts, their presence nevertheless suggests the possibility that other areas of the site may contain undisturbed deposits associated with those periods.

In addition to temporally diagnostic artifacts, cultural features often contain well-preserved organic remains that can be used to obtain radiometric dates. One intact feature was identified at 3WA1444, and although it did not appear to contain abundant quantities of organic material suitable for radiometric dating, its presence suggests that other intact features may be present. If so, those features could include pits, hearths, or even the remains of shelters. Radiometric dating of materials recovered from such features will assist in more precise determination of the age(s) of the site occupations, as well as the site's broader position within the local and regional cultural chronology.

3.4 Settlement Patterns and Landscape Use

Models of Pre-Contact mobility and settlement patterns are constructed using a variety of archaeological datasets from multiple sites within a given region to identify commonalities and differences between the types of activities represented at various points on the landscape. Phase III excavations at Site 3WA1444 are expected to recover multi-dimensional datasets, including an extensive artifact assemblage consisting of a variety of different types of implements and the debris from their manufacture; occupational features such as hearths, pits, and perhaps the remains of structures; and other evidence of daily life (e.g., subsistence remains). Analysis of these datasets will provide information on the range of activities

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represented at the site, and the degree to which the location was used relative to other excavated sites in the region and, potentially, outside the local region. The data will be compared to similar datasets from other sites in the region to identify broader patterns of landscape occupation and use, and will contribute to the larger body of information about how ancient Native American groups occupied and used the local landscape.

3.5 Subsistence Patterns and Site Seasonality

The cultural material recovered during the Phase II investigations at 3WA1444 did not include remains of seasonally-available plant or animal resources that could be used to develop inferences about the seasonal patterning of Pre-Contact occupation or use of the site. However, if additional cultural features are preserved at 3WA1444, they may—as noted previously—contain such remains. If recovered through appropriate methods (e.g., soil samples that can be processed through flotation to recover fragile remains for specialized analysis), remains such as animal bones, seeds, and nut shell provide significant information about Pre-Contact diet and food preparation practices.

In addition, because most food resources exhibit seasonal changes in availability, paleosubsistence datasets—especially datasets that contain representation of multiple plant and animal species—also provide information about the time of the year during which a given site was most frequently occupied.

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4.0 ARCHAEOLOGICAL TREATMENT PLAN FOR SITE 3WA1444

The archaeological data recovery / mitigation excavation ("Phase III") at Site 3WA1444 is intended to recover artifacts, document cultural features, and collect other archaeological data that will be lost due to impacts to the site from the construction of the Springdale Northern Bypass. The site has significant potential to address a number of different research questions (see **Section 3.0**), and the field effort will focus on exposing and recovering archaeological data preserved at the site in order to address some or all of those questions. Results from the Phase II investigation suggest that the site lithic assemblage will be extensive, and consequently special attention will be given to recording spatial information about lithic artifact distribution within the site that may reflect differences in the types and intensity of lithic material reduction, tool manufacture, repair, and use, and tool discard. Field efforts will also focus on exposing and excavating archaeological features, which—if identified—will provide secure depositional contexts from which to extract site occupational data.

Based on the results of the Phase II investigation (and also on information about the site gleaned from the Phase I survey report), WSP proposes that the Phase III treatment / data recovery plan consist of a combination of : (1) remote geophysical survey to identify potential areas in which intact subsurface features may be present; (2) hand-excavation of archaeological test units that collectively will comprise a 10-pecent sample[1] of approximately 1,250 sq m of the site that is estimated to contain NRHP-eligible deposits; (3) mechanical stripping of the plow zone on up to an additional 25 percent of the NRHP-eligible area to identify additional sub-surface cultural features; (4) feature excavation and documentation; (5) laboratory analysis of site artifact assemblages, including specialized analysis of zooarchaeological or paleobotanical materials if recovered; (5) preparation of a report of investigations; and (6) preparation of project materials, artifacts, and data for permanent curation at the University of Arkansas-Fayetteville Collections Facility (and delivery to the facility) at the completion of the project.

4.1 Geophysical Survey

Prior to the commencement of hand-excavation of archaeological test units, a geophysical remote sensing survey will be conducted to identify potential areas within the site that may contain intact, subsurface cultural features. The geophysical remote sensing methods may include one or more of the following technologies: (a) soil electrical resistivity; (b) magnetometry / gradiometry; and / or (c) ground penetrating radar.

WSP's geophysical / remote sensing staff, in conjunction with the project principal investigator, will consult with ARDOT to determine the most effective technology and strategy for the geophysical survey, based on local conditions and the anticipated types of subsurface archaeological features.

In order to ensure broad coverage—and because geophysical surveys can be conducted relatively rapidly in open terrain such as that documented at 3WA1444—the geophysical survey will extend across the full width of the project ROW from east to west, and between the north and south boundaries of the site within the ROW (**Figure 10**).

[1] ARDOT recommends a 10-percent sample for data recovery excavations (Kristina Boykin, personal communication).

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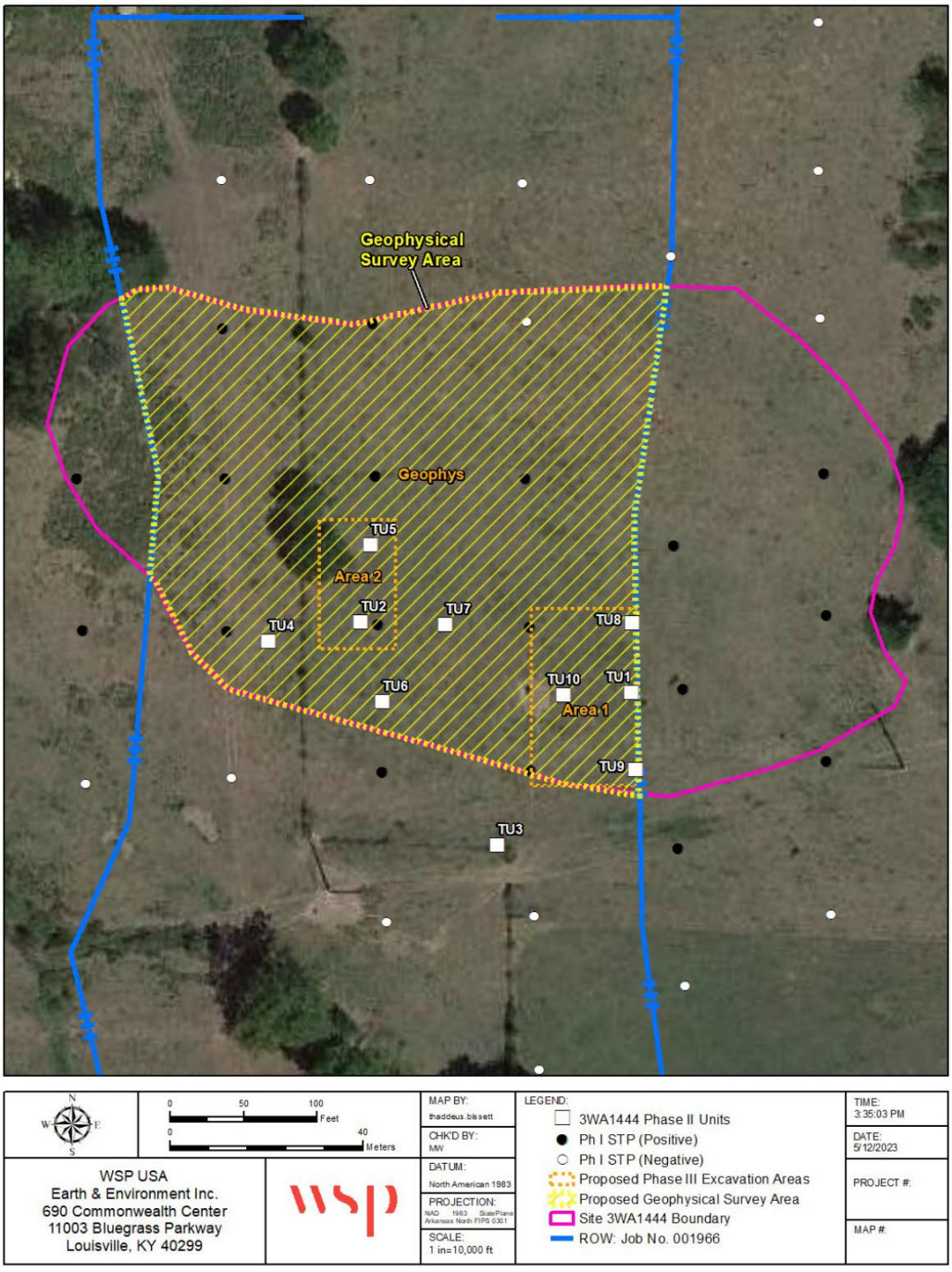

Figure 10. Proposed Phase III investigation areas, and areas of previous (Phase II and Phase I) investigations.

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4.2 Hand-Excavated Test Units and Shovel Tests

The principal effort for the Phase III data recovery will consist of hand-excavation of test units at 3WA1444, equivalent to approximately 10 percent of the site that is likely to contain intact cultural deposits, as indicated by the results of the Phase II investigation. Based on the results of Phase II unit excavation, intact cultural deposits may be present in two areas, centered on Test Units 1 and 2. Area 1 (Test Units 1, 8, 9, and 10) encompasses approximately 815 sq m, and Area 2 (Test Units 2 and 5) totals 425 sq m. At a 10-percent sample, the total area expected for hand-excavation will therefore not exceed 125 sq m.

At the initiation of the excavation, 50-x-50 cm STPs will be placed over anomalies identified during the geophysical survey to determine if features are present. If features or other cultural material are identified in intact context in those STPs, they will be expanded and additional 1-x-1 m units will be positioned around them to form excavation blocks.

Excavation blocks will consist of groupings of multiple individual excavation units nominally measuring 1-x-1 m that will be placed at the discretion of the field director. In addition to blocks coalescing around anomaly-positive STPs, unit groupings will be initiated around Test Units 1 and 2. Expansion of the excavation blocks during the Phase III investigation will be based on a combination of the previous Phase II results as well as ongoing findings during the investigation, such as remote sensing, a high density of artifacts, and/or the presence of intact features.

Units will be excavated in arbitrary 10-cm levels until culturally sterile subsoil is reached (determination of "sterile" context consist of two levels of zero artifact recovery).

Although the Phase II investigation identified a disturbed plow zone at Site 3WA1444, extending to an average of between 25 and 30 cmbs, as noted in **Section 2.2**, archaeological material recovered in plow zone contexts has the potential to contribute useful information about overall intensity of site occupation over time, as well as information about the ways that human historic and modern-era activities may impact archaeological sites, and how those impacts can be understood, identified, and interpreted. Consequently, archaeological excavation and recovery of cultural materials will make no significant field methodological distinction between 10-cm levels within or below potential plow zone contexts. (However, see below, **Section 4.2**, concerning potential labor- and cost-saving options in laboratory analytic procedures.)

Artifacts will be recovered by screening excavated soils through 0.25-in (6.25-mm) hardware mesh. WSP recommends that Fire-cracked rock (FCR) be documented in the field and discarded. This approach will allow information about FCR density across the site to be collected, while avoiding the significant expense of analysis and curation of materials that are of limited utility in addressing the types of research questions discussed in **Section 3.0**. Based on the results of the Phase II investigation at the site, each 1-x-1 m test unit produced an average of 375 Pre-Contact artifacts. Therefore, WSP estimates that excavation of approximately 125 sq m of Site 3WA1444 may produce up to 46,875 artifacts, not including any temporally diagnostic artifacts potentially recovered and retained from mechanically stripped areas of the site (see below). Diagnostic artifact locations and artifact concentrations will be mapped in situ when possible, in order to identify areas of concentrated cultural activity within the exposed site area(s). Intact cultural features identified within the hand-excavated areas will be excavated and documented.

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4.3 Mechanical Stripping

Following the completion of test unit excavation, WSP will initiate mechanical stripping of an additional 25 percent sample at 3WA1444 to remove the disturbed plow zone and expose any features that may be preserved intact in other areas of the site. Excavations will be supervised by the principal investigator or another Secretary of Interior qualified archaeologist and will be conducted by a backhoe using a smooth-edged bucket. The locations of the areas to be stripped at each site will be guided by information obtained from test unit excavations on the horizontal and vertical extent of cultural deposits. The plow zone will be removed in a series of shallow (ca. 10-cm) passes. Temporally diagnostic artifacts exposed during stripping will be mapped and collected. Cultural features exposed during stripping will be documented.

Initial stripping will consist of a series of 2-m wide linear trenches spaced at 5-m intervals. After any features exposed in the initial 2-m trenches have been documented, the remaining area allocated for mechanical stripping will be exposed to focus on locations that may contain feature clusters or other significant archaeological depots identified during the initial stripping.

4.4 Feature Documentation and Excavation

Archaeological features identified during unit excavation or mechanical stripping will be fully exposed and documented in accordance with standard methods and protocols. Artifacts from feature contexts will be cataloged and analyzed, and soil flotation samples will be collected from excavated features to recover fragile paleobotanical remains or other fragile or minute materials or artifacts, such as faunal remains or lithic micro-debitage. For small features such as postholes, up to 100 percent of their contents may be recovered as a soil sample. For larger features, one or more soil samples may be recovered for flotation analysis.

If charcoal is identified *in situ* during feature excavation, samples will be recovered to be used for possible radiometric dating. For purposes of planning, WSP anticipates documenting and investigating up to 20 archaeological features at 3WA1444. These may include hearths or firepits, storage or refuse pits, dense FCR clusters, or posts.

4.5 Laboratory Artifact Analysis

The recovered artifact assemblage from 3WA1444 will be returned to WSP's archaeological laboratory in Louisville, Kentucky, to be processed, analyzed, and cataloged. Data collected from the analysis will be entered into WSP's analytical database and all tabulated data will be included in the final project report. WSP practices a robust set of analytical procedures for Pre-Contact artifacts that are intended to facilitate site interpretation and provide comparative data for future research.

Analysis of the recovered artifact assemblage and materials will include:

1) Inventory and classification of all Pre-Contact artifacts, including chipped stone, pecked and groundstone tools, bone or antler tools (if recovered), Pre-Contact ceramics (if recovered), and other artifact types;
2) Lithic raw material classification and source analysis (if possible), to address questions about regional mobility or exchange;
3) Macroscopic analysis of chipped stone tool technology, including bifaces, unifaces, flaketools, and cores for use wear or damage;

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4) Classification and comparative analysis of hafted bifaces (including "projectile points") and other potentially temporally diagnostic tools or artifacts;
5) Flotation recovery and analysis of paleoethnobotanical remains recovered from feature soil flotation samples. WSP estimates analyzing 10 feature flotation samples;
6) Accelerator mass spectrometry (AMS) radiocarbon analysis of up to 20 samples (one radiometric date per feature) to obtain chronological information about the age and occupational duration of deposits at the site; and
7) Analysis of faunal remains, if recovered.

In addition to the more generalized analyses described above, WSP will conduct a detailed analysis of the recovered lithic debitage assemblage to address organization of technology-related research questions.

Based on the size of the lithic artifact assemblage recovered during the Phase II investigation of Site 3WA1444, WSP estimates that lithic debitage recovered during the Phase III investigation of the site may amount to as many as 8,000 – 10,000 artifacts. In order to efficiently extract information from the anticipated artifact assemblage that can be used to address critical research questions, WSP's analysis of the lithic debitage from the two site will consist of two stages. **Stage 1** will be a standard mass analytic approach of the full debitage assemblage. **Stage 2** will consist of individual flake attribute analysis (IFAA) on a 50 percent sample of platform-bearing flakes (PBFs) recovered during the Phase II and Phase III excavations (up to 14,000 artifacts).

Mass/aggregate analysis is a well-developed set of lithic analytic methods used to efficiently characterize large lithic debitage assemblages and the types and frequency of different lithic reduction activities that produced them (e.g., Ahler 1989, Andrefsky (ed.) 2001, Andrefsky 2005). In general, lithic waste flakes removed during the initial/early stages of the reduction of a piece of raw material to a tool or other usable object are larger than flakes detached during later stages in the process. The trend from larger to smaller flake size during the reduction sequence reflects the progressive decrease in size of the piece of material or tool blank as it approaches the intended form, as well as more frequent small flake removals to make smaller and more precise corrections to the tool's shape in the final stages of manufacture. Because mass analysis deals with lithic artifacts in aggregate rather than individually, the approach can provide a relatively rapid means of assessing the general types of reductive activities represented in large lithic assemblages. Data obtained using mass analysis can indicate the proportion, for example, of knapping activity at a site that occurred during the initial stages of material preparation from raw, quarried or collected pieces (larger debris bearing a higher proportion of cortical surface) versus the proportion of tool manufacture or repair (smaller flakes with little cortex and more evidence prior flake removals).

Mass analysis of lithic debitage can provide excellent *general* information about a lithic debitage assemblage, and can be effective for assessing the origin of assemblages consisting of debris predominately resulting from a single type of reduction activity (e.g., quarrying versus tool production). However, on its own mass analysis is not well suited to complex, multi-dimensional assemblages, such as those consisting of the remains of a variety of different reductive activities. Where more high-resolution lithic artifact data about a site assemblage are required, mass analysis is best utilized in combination with some form of individual flake attribute analysis (IFAA).

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Lithic reduction involves the patterned, sequential removal of individual flakes from a larger initial piece of raw material (the "objective" piece) to modify its size and shape to a desired form. Each flake that is removed retains a portion of the edge or surface of the objective piece from which it was removed, and flakes removed later in the reduction process bear the cumulative scars left from previous removals. The remnants of those scars are retained on the surfaces of the detached flake—especially the striking platforms (see Bradbury and Carr 2014:22)—and can provide information about the objective piece from which the flake was removed, as well as *when* during the reduction process a particular flake was removed.

Stage 1: Mass Analysis

For the lithic assemblage recovered at Site 3WA1444, the **Stage 1** mass analysis will include the following steps:

1) All lithic debitage will be size sorted using nested 1-inch (2.54-cm), .5-inch (1.25-cm), and .25-inch (6.35-mm) geological sieves.

2) Lithic artifacts in each size grade will be classified as platform-bearing flake / broken flake, flake fragment, or blocky shatter.

3) Lithic artifacts in each size grade will be classified by raw material, using the raw material comparative collection at WSP's Louisville laboratory.

4) Lithic artifacts in each size grade will be examined for evidence of thermal alteration. Thermal alteration presence or absence will be assessed by examining ventral and dorsal surfaces of lithic debitage, and flake scars on non-debitage artifacts, for evidence of heat-induced color *and* texture changes between exterior and interior surfaces (e.g., Etchieson and Trubitt 2013:398).

5) Lithic artifacts in each size grade and classification will be counted and weighed.

If it is demonstrated during the investigation that plow zone contexts are not appreciably different in temporal and cultural affiliation from sub-plow zone contexts, then the **Stage 2** analysis will draw from the full site assemblage. If diagnostic materials indicate that plow zone and sub-plow zone contexts are representative of different temporal or cultural periods and / or different occupational eras, then **Stage 2** will draw only from intact sub-plow zone contexts.

Stage 2 will focus on a randomized sample of all platform-bearing flakes (PBFs) in each size grade, which will be separated from other lithic artifacts for additional analysis during the **Stage 2** IFAA. To avoid potential bias in selecting the sample, artifacts will be separated for IFAA analysis during the counting process to "distract" the laboratory technician from other characteristics (e.g., size, color, attributes) that might influence selection.

Stage 2: Individual Flake Attribute Analysis (IFAA)

For two reasons, the Stage 2 analysis will focus only on PBFs. First, as noted previously, PBFs generally retain a greater number of individual attributes associated with the reduction stage during which they were detached. Second, and more critically, no detached flake has more than one striking platform, but a single detached flake can break into multiple fragments. By using only PBFs for IFAA, it is possible to sidestep potential problems of over-enumeration that might result from the counting of multiple fragments of the same flake as separate pieces of debitage.

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The **Stage 2** IFAA will record categorical data on the following flake attributes, which have previously been shown to be especially useful for analyses intended to identify the types of lithic reductive activities represented in a given assemblage include the following:

1) Flake dorsal cortex (Ahler 1989:90)

2) Platform facets or scars (Bradbury and Carr 2004, 2014; Magne 1985:111-129)

3) Flake dorsal scars (Bradbury and Carr 2014; Magne 1985:111-125)

These types of attributes, and the general analytic protocols, are widely used in archaeological analysis of lithic debitage, and so their application to the assemblage from Site 3WA1444 will enable comparative analyses between the assemblage from this site to sites previously excavated elsewhere in the region and beyond, or to assemblages recovered from as-yet uninvestigated sites.

The data obtained during **Stage 1** and **Stage 2** of the lithic debitage analysis will be described, summarized, analyzed, and interpreted using a variety of statistical methods. The specific methods used will be selected based on the data, but there are numerous potential statistical tests available for the types of data produced by both aggregate and IFAA analytic methods, including: basic descriptive and summary statistics; univariate and multivariate sample and sub-sample comparative methods (e.g., ANOVA or MANOVA); and classificatory algorithms such as discriminant function analysis (see Bradbury and Carr 2004, 2014) and dimension reduction methods (e.g., clustering). The combined datasets from IFAA and aggregate analysis will also be utilized in conjunction with spatial data collected during the Phase III investigation to identify specialized activity areas within a site or excavation block that may have been associated with different lithic material processing or manufacturing stages. To address such questions, spatial analytic and spatial statistical tools available as part of Geographic Information Systems (GIS) software will be applied to the data as appropriate (e.g., see Bissett and Garrow 2016:72-73).

4.6 Project Reporting

The results of all archaeological excavations conducted by WSP for ARDOT Job 001966 will be documented in three separate deliverables: (1) a management summary report; (2) a draft project report of investigations; and (3) a final project report.

As WSP has discussed previously with ARDOT, the project report will include the following information:

- The results of Phase III investigations at Site 3WA1444;
- The results of Phase II investigations at sites 3WA1441, 3WA1442, 3WA1444, and 3WA1454[2];
- The results of Phase I survey of previously unsurveyed project ROW located along Old Highway 68 approximately 300 m northwest of its current intersection with West Henri de Tonti Boulevard / US-412.

[2] At the time of the preparation of this treatment plan, Phase II investigations at 3WA1454 have not yet been completed. It is possible that the investigation may determine that 3WA1454 contains NRHP-eligible cultural deposits. If so, and at ARDOT's request, WSP will update this treatment plan to include any additional requested work at 3WA1454.

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4.7 Data Recovery Schedule and Labor Estimates

Following ARDOT's review of this draft treatment plan, and any requested changes or revisions, WSP will work with ARDOT to develop a project budget and schedule designed to address specific project needs and deliverables as delineated in final treatment plan.

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Appendix B: USFWS Coordination

Appendix B is referenced in:

- Section 5.9

IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Arkansas Ecological Service Field Office
110 South Amity Road, Suite 300
Conway, Arkansas 72032

May 23, 2023

Mr. John Fleming
c/o Mickey Matthews
Arkansas Department of Transportation
10324 Interstate 30
Little Rock, Arkansas 72209

Consultation Code: 2023-0080096

Dear Mr. Fleming:

The U.S. Fish and Wildlife Service (Service) has reviewed your request, assessment, and determinations for Arkansas Department of Transportation (ARDOT) Job 012326 - Hwy. 412 - Hwy. 112 (Springdale Bypass) (S), Benton and Washington counties, Arkansas. We received your request on May 12, 2023.

ARDOT made the following assessment and determination:

> ARDOT is planning to construct the western portion of the Springdale Bypass from Hwy. 112 to Hwy. 412. This will be a four-lane divided highway on new location in Benton and Washington Counties.
>
> I have attached the updated IPAC species list for your convenience. The project is outside the scope of both the USFWS Arkansas DKey and the FHWA, FRA, FTA Programmatic Biological Opinion for Transportation Projects within the Range of the Indiana Bat and Northern Long-eared Bat (PBO) due to the size of the project. A presence/probable absence survey was conducted for Indiana and Northern Long-eared Bats.
>
> The project should have no effect on the Piping Plover (*Charadrius melodus*), Eastern Black Rail (*Laterallus jamaicensis ssp. jamaicensis*), Red Knot (*Calidris canutus rufa*), and the Ozark Big-eared Bat (*Corynorhinus (=Plecotus) townsendii ingens*) due to limited scope of the project, lack of habitat, and distance to known populations. ARDOT has determined the project is not likely to adversely affect the Benton County Cave Crayfish (*Cambarus aculabrum*), Missouri Bladderpod (*Physaria filiformis*), Neosho Mucket (*Lampsilis rafinesqueana*), Ozark Cavefish (*Troglichthys rosae*), Gray Bat (*Myotis grisescens*), Indiana Bat (*Myotis sodalis*), and Northern Long-eared Bat (*Myotis septentrionalis*). The project will not jeopardize the existence of the Alligator Snapping Turtle (*Macrochelys temminckii*), Tricolored Bat (*Perimyotis subflavus*), or the Monarch Butterfly (*Danaus plexippus*).
>
> The Arkansas Department of Transportation is requesting concurrence with these effects determinations.

The concurrence letter provided by IPaC states: "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. This letter verifies that consultation on the Action is complete and no further action is necessary." Our office concurs with this determination.

Furthermore, due to the location of the area being affected, minimal to no suitable listed species habitat within the footprint of the action, the distance to known species locations, the lack of known caves and other karst features in the project area, the negative findings from the bat survey, and the implementation of BMPs, the Service concurs with your determinations of "may affect, but is not likely to adversely affect" for the listed species identified. Additionally, the Service concurs with your non-jeopardy determinations. This concurrence concludes your ESA Section 7 responsibilities for this action.

If caves or other karst features are encountered during construction, the Service requests that work efforts cease within 300 feet of the opening. The opening should be adequately marked and protected from work activities, and the Service should be contacted immediately for further guidance. No fill materials should be placed into the opening until Service or Service approved personnel have the opportunity to assess the site.

For further assistance or if you have any questions, please contact Lindsey Lewis at (501) 513-4489 or lindsey_lewis@fws.gov.

Sincerely,

Melvin L. Tobin
Field Supervisor

cc: Project File
Read File
Filename: https://doimspp-my.sharepoint.com/personal/lindsey_lewis_fws_gov/Documents/Documents/PROJECTS/FY2023/ARDOT/ARDOT Jomb 012326 - Hwy. 412 - Hwy. 112 (Springdale Bypass) (S)/20230515_Ltr_Concurrence_ARDOT Job 012326_LCL.docx

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
Phone: (501) 513-4470 Fax: (501) 513-4480

In Reply Refer To: May 12, 2023
Project code: 2023-0080096
Project Name: 012326 - Hwy. 412 - Hwy. 112 (Springdale Bypass) (S)

Federal Nexus: yes
Federal Action Agency (if applicable): Federal Highway Administration

Subject: Federal agency coordination under the Endangered Species Act, Section 7 for '012326 - Hwy. 412 - Hwy. 112 (Springdale Bypass) (S)'

Dear mickey matthews:

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 May 12, 2023, for '012326 - Hwy. 412 - Hwy. 112 (Springdale Bypass) (S)' (here forward, Project). This project has been assigned Project Code 2023-0080096 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.

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:

- Alligator Snapping Turtle *Macrochelys temminckii* Proposed Threatened
- Benton County Cave Crayfish *Cambarus aculabrum* Endangered
- Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* Threatened
- Gray Bat *Myotis grisescens* Endangered
- Indiana Bat *Myotis sodalis* Endangered
- Missouri Bladderpod *Physaria filiformis* Threatened
- Monarch Butterfly *Danaus plexippus* Candidate
- Neosho Mucket *Lampsilis rafinesqueana* Endangered
- Ozark Big-eared Bat *Corynorhinus (=Plecotus) townsendii ingens* Endangered
- Ozark Cavefish *Amblyopsis rosae* Threatened
- Piping Plover *Charadrius melodus* Threatened
- Red Knot *Calidris canutus rufa* Threatened
- 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 Arkansas Ecological Services Field Office and reference Project Code 2023-0080096 associated with this Project.

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

1. Name

012326 - Hwy. 412 - Hwy. 112 (Springdale Bypass) (S)

2. Description

The following description was provided for the project '012326 - Hwy. 412 - Hwy. 112 (Springdale Bypass) (S)':

> Construct approximately 7 miles of divided four lane highway on new location with a new interchange with NW Arkansas Regional Airport.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.203560100000004,-94.25136603581582,14z

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) are likely to be 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. With this question, we are looking for data that, for some reason, may have not yet been made available to U.S. Fish and Wildlife Service.

   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?

   Yes

6. FHWA, FRA, and FTA have completed a range-wide programmatic consultation for transportation- related actions within the range of the Indiana bat and northern long-eared bat.

   Does your proposed action fall within the scope of this programmatic consultation?

   Note:If you have **previously consulted** on your proposed action with the Service under the NLEB 4dRule, answer 'no' to this question and proceed with using this key. If you have **not yet consulted** with the Service on your proposed action and are unsure whether your proposed action falls within the scope of the FHWA, FRA, FTA range-wide programmatic consultation, please select "Yes" and use the FHWA, FRA, FTA Assisted Determination Key in IPaC to determine if the programmatic consultation is applicable to your action. Return to this key and answer 'no' to this question if it is not.

   No

7. 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

8. 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

9. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

   No

10. 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

11. 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

12. 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

13. 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

14. Will the action cause effects to a bridge?

    No

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

    No

16. 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

17. 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

18. 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.).

    Yes

19. Will any new road go through any area of contiguous forest that is greater than or equal to 10 acres in total extent?

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

    Yes

20. For every 1,000 feet of new road that crosses between contiguous forest patches, will there be at least one place where bats could cross the road corridor by flying less than 33 feet (10 meters) between trees whose tops are at least 66 feet (20 meters) higher than the road surface?

    No

21. Will the proposed action result in the cutting or other means of knocking down, bringing down, or trimming of any trees suitable for northern long-eared bat roosting?

    Note: Suitable northern long-eared bat roost trees are live trees and/or snags ≥3 inches dbh that have exfoliating bark, cracks, crevices, and/or cavities.

    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.

85.2

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

85.2

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

85.2

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.

85.2

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.

0

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 by completed by April 1, 2024?

No

IPAC USER CONTACT INFORMATION

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Address: 10324 I-30
City: Little Rock
State: AR
Zip: 72203
Email mickey.matthews@ardot.gov
Phone: 5015692594

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration

COPPERHEAD
ENVIRONMENTAL CONSULTING

Draft Report

Listed Bat Presence/Probable Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S), Washington and Benton Counties, Arkansas

ARDOT Job No. 012326

Submitted to:

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Lead Natural Resources Specialist
Environmental Division – Natural Resources Section
Arkansas Department of Transportation
10324 I-30, P.O. Box 2261
Little Rock, AR 72203

Mr. Lindsey Lewis
Highway/ARDOT Liaison
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Mr. Tommy Inebnit
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19 September 2022

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COPPERHEAD
ENVIRONMENTAL CONSULTING

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COPPERHEAD
ENVIRONMENTAL CONSULTING

PROJECT INTRODUCTION

Copperhead Environmental Consulting, Inc. (Copperhead) was contracted by ARDOT to conduct a presence/probable absence (P/A) mist-net survey for federally listed bats for proposed habitat removal on the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project, in Washington and Benton Counties, AR (Appendix A). The goal of the survey was to document the P/A of the federally endangered Indiana bat (*Myotis sodalis*), Ozark big-eared bat (*Corynorhinus townsendii ingens*), gray bat (*Myotis grisescens*), and the federally threatened[1] northern long-eared bat (*Myotis septentrionalis*), collectively referred to as listed bats. A Study Plan was submitted to the US Fish and Wildlife Service (USFWS) Arkansas Field Office on 31 May 2022 and concurrence was received 2 June 2022. Surveys were conducted under USFWS Permit ES94849B-2 and Arkansas Game and Fish Commission (AGFC) Scientific Collection Permit# 032420222.

METHODS

Site Selection/Mist-netting

Mist-netting was implemented to determine P/A in accordance with USFWS 2022 *Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines* (Guidance). Per the Guidance, the project was divided into nine, one-kilometer survey sections. Surveys were conducted between 12-18 July, and 26 July. In total, 36 net nights of survey were conducted for the project. Mist-net site locations were chosen after field reconnaissance of the project area and after landowner permission was acquired (Table 1). Mist-net site photographs are provided in Appendix B.

Mist-nets were set to maximize coverage of flight paths used by bats along suitable travel corridors or foraging areas. Placement of mist-nets was based on the extent of canopy cover, presence of an open flyway, and forest conditions near the site. Actual location and orientation of each net was determined in the field by qualified biologists. The mist-net site consisted of two mist-net locations monitored for two nights. Nets were deployed at sunset each night, left open for at least five hours, checked every 10 minutes, and disturbance near the nets was kept to a minimum. Weather data, including temperature, wind speed, and cloud cover was recorded for each site on an hourly basis to ensure compliance with the mist-netting guidelines (i.e., temperatures below 50°F, precipitation that exceeds one half hour, or sustained wind speeds greater than 9 mph).

[1] On March 23, 2022, USFWS proposed to reclassify the northern long-eared bat as an endangered species. Final decision expected December 2022 (USFWS 2022).

Table 1. Site information for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project.

Site	Description	Dates (2022)	# of Net Nights	Latitude	Longitude
Site 1	Forested pool west of AR412 and east of AR852.	12-13 July	4	36.17620	-94.31194
Site 2	Woodlot at the NW junction of Hwy 412 and Old Hwy 68.	14, 16 July	4	36.17828	-94.29381
Site 3	Field and woodlot north of AR 904.	18, 26 July	4	36.18704	-94.27869
Site 4	Brush Creek tributary north off of Foster Lane.	12-13 July	4	36.19083	-94.27207
Site 5	East side of driveway for 846/856 Javello Rd.	14-15 July	4	36.18885	-94.25879
Site 6	Woodlot north of Millsap Rd.	17-18 July	4	36.19695	-94.24793
Site 7	Brush Creek south of the intersection of Hwy 60 and Elm Valley Ln.	15-16 July	4	36.20576	-94.24944
Site 8	Woodlot northeast of Trails End Ranch Rd.	14, 16 July	4	36.22400	-94.25166
Site 9	Woodlot northwest of new road construction for HWY 112.	17-18 July	4	36.22821	-94.23665

Bats were live-caught and released unharmed near the point of capture. Biological and morphometric data (i.e., species, sex, age class, reproductive condition, mass, and forearm length) were recorded on data sheets for individuals captured. In addition, the height and the specific net set of capture were recorded for each bat. Processing of bats was completed within 30 minutes from the time the bat was removed from the net.

White-Nose Syndrome Protocol

To minimize the transmission of White-nose Syndrome (WNS) between captured bats, all netting and field activities followed the most recent guidelines established by USFWS. All hard, non-porous netting equipment was sanitized with Isopropyl alcohol wipes prior to arrival and after each survey night; all other equipment was submersed in hot water (131°F) for a minimum of five minutes. Individual bats were kept in unused paper bags while waiting processing. Disposable

latex gloves were worn over sanitized handling gloves and changed or sanitized following the handling of each bat. All non-disposable equipment (e.g., Pesola scales, rulers, calipers, etc.) coming into contact with bats was sanitized immediately following the handling of each bat. Bats were evaluated for potential WNS infection through wing scoring following the *Wing-Damage Index Used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome* (Reichard 2008).

COVID-19 Protocol

In accordance with *Guidance for FWS employees engaging in Activities with Bats* (USFWS 2020) and the requirements outlined in our AGFC Scientific Collection Permit, KN95 masks and latex gloves were worn while handling bats. Required photographs were still taken for confirmation of species when required, but all unnecessary handling was reduced.

When in the field, personnel monitored themselves and each other for signs of COVID-19 infection, including but not limited to, periodic temperature checks and communication among the staff. If any person had shown signs of infection, that person would have been isolated and returned home as soon as possible.

RESULTS

Bat Captures

Twenty-seven bats were captured, with the majority (63%) being federally endangered gray bats (*Myotis grisescens*; Table 2). Photographs of species captured can be found in Appendix C. No other listed species were captured. Completed mist-net data sheets are provided in Appendix D.

Table 2. Summary of bat captures by species, age, sex, and reproductive condition for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project.

Species	Adult Male		Adult Female				Juvenile		UNKN	Total
	NR	SCR	PG	L	PL	NR	Male	Female		
Lasiurus borealis	-	-	-	1	1	-	3	4	-	**9**
Myotis grisescens	-	-	-	-	4	-	10	3	-	**17**
Nycticeius humeralis	-	-	-	-	-	-	-	1	-	**1**
Total	**-**	-	**-**	**1**	**5**	**-**	**13**	**8**	**-**	**27**

NR = non-reproductive; SCR = scrotal; L = lactating; PG = pregnant; PL = post lactating, UNKN = unknown (escape at net)

Habitat

The survey area is located southeast of Cave Springs, Arkansas and is a mix of forested habitat, agricultural, and developed lands. Land cover among the majority of survey sites were considered low to moderate; trees were present in the form of small woodlots and wooded fencerows with areas of moderate fragmentation. Forest structure was classified as poor [i.e., habitat even aged and young, with cluttered understory growth] at Site 5, moderate [i.e., moderate diversity within the stands, trees > 15 inches Diameter at Breast Height (DBH) present, understory clutter dominant but not ubiquitous] at Sites 1, 2, 3, 4, 6, and 7, and optimal at Sites 8 and 9 with a diverse age classes of trees present, trees > 15-inch DBH frequent, and varying tree height and treefalls that allow for frequent small openings and gaps that facilitate bat foraging. The five most common tree species across the project included white oak (*Quercus alba)*, American elm (*Ulmus americana*), mockernut hickory (*Carya tomentosa*), green ash (*Fraxinus pennsylvanica*), and American sycamore (*Platanus occidentalis*). Water resources were considered poor at Sites 2, 3, 5, and 8 with no drinking resources present, moderate at Sites 6 and 9, and optimal at sites 1, 4, and 7, with nets placed over a creek or near a pond. Roost habitat was considered poor at Sites 1, 5, and 6 which had no or few snags over 5 inches DBH with exfoliating bark or other roost features while Sites 2, 3, 4, and 7 were considered moderate, and optimal at Sites 8 and 9.

CONCLUSIONS

The mist-net survey effort (36 net nights conducted over 8 calendar nights) was conducted under the appropriate weather conditions to determine P/A of federally listed bats during the maternity season (USFWS 2022).

Federally endangered gray bats were the most common bat captured during the project. Coordination with ARDOT and USFWS Arkansas Field Office confirmed the presence of two known gray bat maternity caves and hibernacula near the project area. No Ozark big-eared bats, Indiana bats, or northern long-eared bats were captured during the survey, indicating these species are not likely present within the project area during the maternity season.

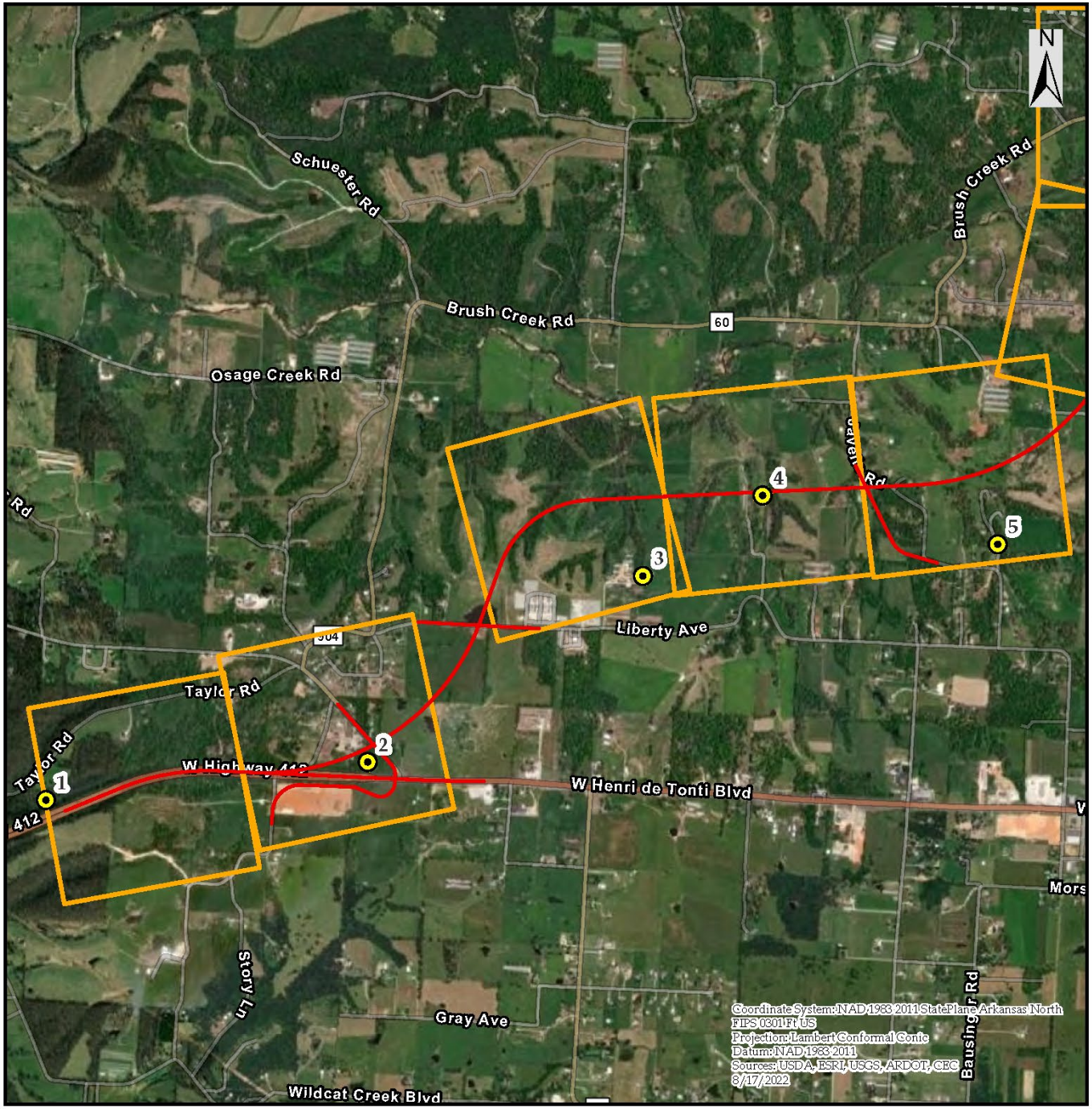
LITERATURE CITED

Reichard, J. D. 2008. Wing-Damage Index Used for Characterizing Wing Condition of Bats Affected by White-nose Syndrome. https://s3.us-west-2.amazonaws.com/prod-is-cms-assets/wns/prod/6f17b4a0-78ad-11e8-b37b-4f3513704a5e-reichard_scarring_index_bat_wings.pdf. Accessed 2 June 2022.

(USFWS) U.S. Fish and Wildlife Service. 2022. Range-Wide Indiana Bat and Northern Long-Eared Survey Guidelines.

(USFWS) U.S. Fish and Wildlife Service. 2020. Guidance for FWS employees engaging in Activities with Bats.

Appendix A: Project Map



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ENVIRONMENTAL CONSULTING

Prepared for:

ARDOT

Job No. 012326

FIGURE 1.1:
Project Map
Washington County, Arkansas

Legend

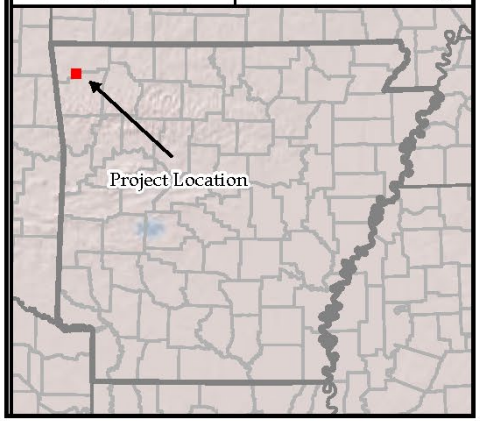
- Mist-net Survey Site
- Project Centerline
- Survey Kilometer

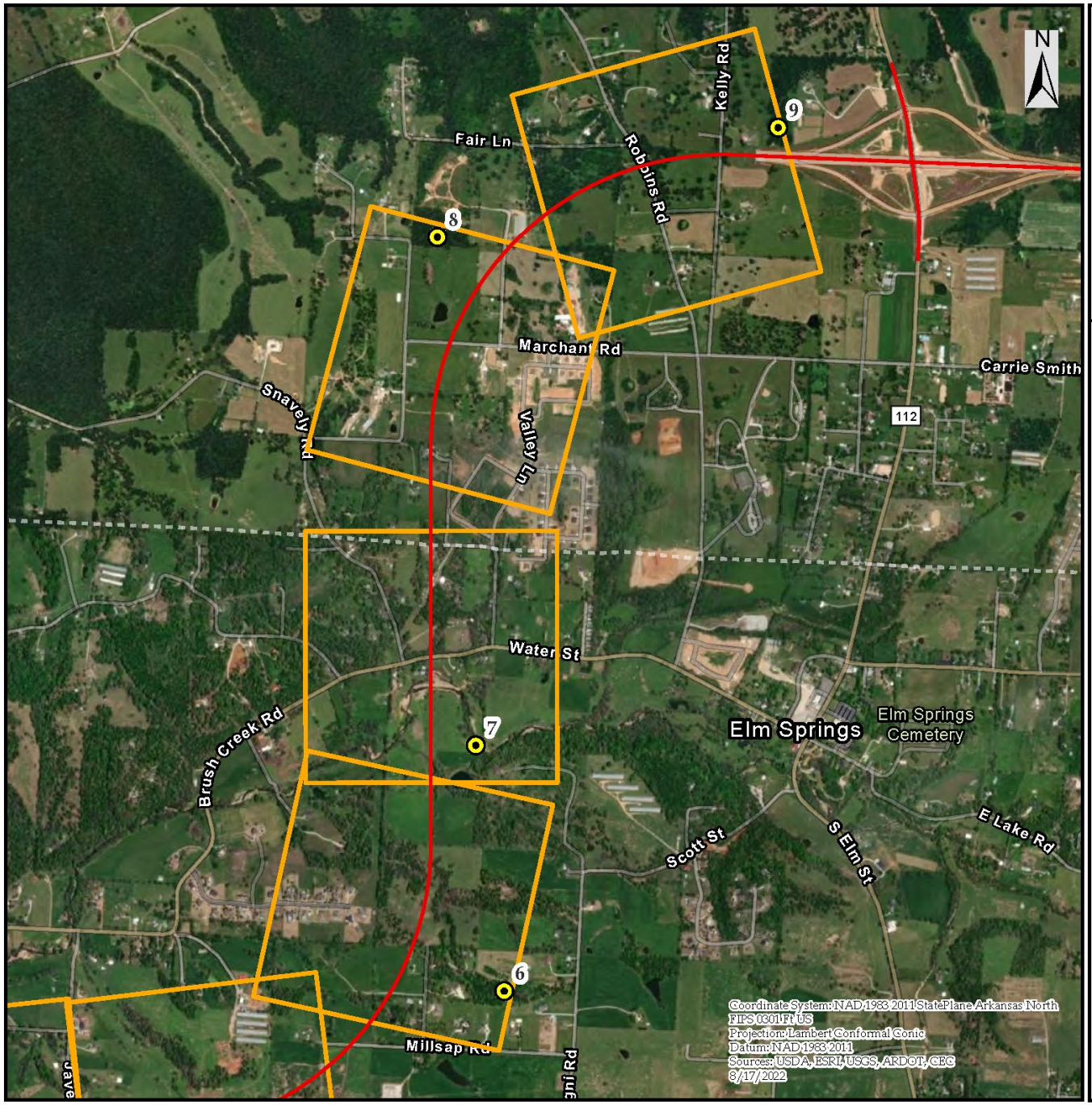
0 2,000 4,000
Feet

Scale: 1:28,000

Prepared by :
Copperhead Environmental Consulting, Inc.
471 Main Street
P.O. Box 73
Paint Lick, Kentucky 40461

Drawn by:	JTC	Date:	8/17/2022
Checked by:	TW	Revision:	01





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Prepared for:

ARDOT

Job No. 012326

FIGURE 1.2:
Project Map
Benton/Washington County, Arkansas

Legend

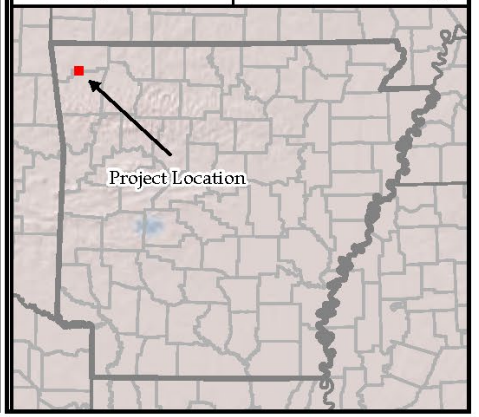
- Mist-net Survey Site
- Project Centerline
- Survey Kilometer

0 1,500 3,000
Feet

Scale: 1:22,000

Prepared by :
Copperhead Environmental Consulting, Inc.
471 Main Street
P.O. Box 73
Paint Lick, Kentucky 40461

Drawn by:	JTC	Date:	8/17/2022
Checked by:	TW	Revision:	01



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Appendix B: Mist-net Site Photographs

COPPERHEAD ENVIRONMENTAL CONSULTING	Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project Photographic Record	
Project No.: 1252	**County, State:** Washington County, AR	**Client:** ARDOT

Site:
1

Description:
Mist-net A located at 36.17604, -94.31199.

Site:
1

Description:
Mist-net B located at 36.17612, -94.31187.

COPPERHEAD ENVIRONMENTAL CONSULTING	Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project Photographic Record	
Project No.: 1252	**County, State:** Washington County, AR	**Client:** ARDOT

Site: 2 **Description:** Mist-net A located at 36.17825, -94.29341.	

Site: 2 **Description:** Mist-net B located at 36.17828, -94.2942.	

COPPERHEAD ENVIRONMENTAL CONSULTING	Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project Photographic Record	
Project No.: 1252	**County, State:** Washington County, AR	**Client:** ARDOT

Site: 3 **Description:** Mist-net A located at 36.187056, -94.278682.	

Site: 3 **Description:** Mist-net B located at 36.187036, -94.278689.	

COPPERHEAD ENVIRONMENTAL CONSULTING	Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project Photographic Record	
Project No.: 1252	**County, State:** Washington County, AR	**Client:** ARDOT

Site: 4 **Description:** Mist-net A located at 36.190842, -94.272105.	

Site: 4 **Description:** Mist-net B located at 36.190860, -94.272120.	

COPPERHEAD ENVIRONMENTAL CONSULTING	Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project Photographic Record	
Project No.: 1252	**County, State:** Washington County, AR	**Client:** ARDOT

Site:
4

Description:
Mist-net C located at 36.190860, -94.272120.

COPPERHEAD ENVIRONMENTAL CONSULTING	Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project Photographic Record	
Project No.: 1252	**County, State:** Washington County, AR	**Client:** ARDOT

Site:
5

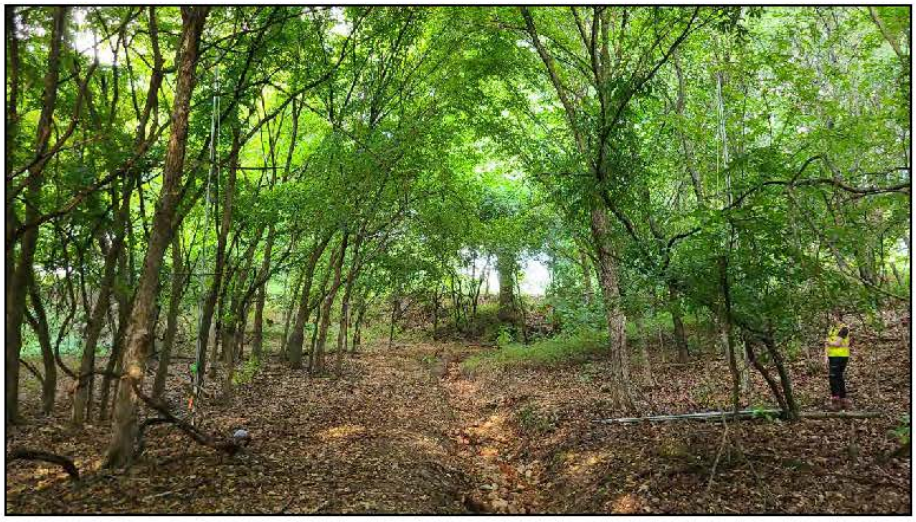
Description:
Mist-net A located at 36.188862, -94.258786.

Site:
5

Description:
Mist-net B located at 36.188865, -94.258778.

COPPERHEAD ENVIRONMENTAL CONSULTING	**Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project Photographic Record**	
Project No.: 1252	**County, State:** Washington County, AR	**Client:** ARDOT

Site: 6 **Description:** Mist-net A located at 36.197062, -94.247841.	

Site: 6 **Description:** Mist-net B located at 36.196962, -94.248430.	

COPPERHEAD ENVIRONMENTAL CONSULTING	Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project Photographic Record	
Project No.: 1252	**County, State:** Washington County, AR	**Client:** ARDOT

Site:
7

Description:
Mist-net A located at 36.2058, -94.24941.

Site:
7

Description:
Mist-net B located at 36.20564, -94.24938.

COPPERHEAD ENVIRONMENTAL CONSULTING	Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project Photographic Record	
Project No.: 1252	**County, State:** Benton County, AR	**Client:** ARDOT

Site:
8

Description:
Mist-net A located at 36.224033, -94.251460.

Site:
8

Description:
Mist-net B located at 36.224092, -94.251321.

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Appendix C: Photographs of Bat Species Captured

COPPERHEAD ENVIRONMENTAL CONSULTING	Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112(Springdale Bypass) (S) Project Photographic Record	
Project No.: 1252	County(s), State: Washington & Benton Counties, AR	Client: ARDOT

Description: Gray bat *(Myotis grisescens)*.	

Description: Evening bat (*Nycticeius humeralis*).	

COPPERHEAD ENVIRONMENTAL CONSULTING	**Listed Bat Presence/Absence Survey for the Hwy 412-Hwy 112 (Springdale Bypass) (S) Project Photographic Record**	
Project No.: 1252	County, State: Washington & Benton County, AR	Client: ARDOT

Description: Eastern red bat (*Lasiurus borealis*).	

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Appendix D: Mist-net Data Sheets

Mist Netting Data Form 2022

Sheet____ of ____

COPPERHEAD ENVIRONMENTAL CONSULTING

Site No. 1252 Site 2 Project.Phase# 02 Project Name ARDOT Hwy 412 - Hwy 112 Bypass Dates 12-13 July 2022

Site Location West of AR 412, approximately 0.3/10 mi. east of AR 852 Habitat Type[1] Creek/riparian

County Washington State AR Permitee Mark Gumbert Technician(s) Ashley Hammer

Lat/Lon or UTM (circle one): N/Easting 36.17620 W/Northing 94.31194 UTM Zone —

#	Date	Time	Species[2]	Age	Sex[3]	Repro[3]	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type___	Freq.	Sample[4]	Comments
			NO BATS												

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
7/12	99.3	20:13	4:37	6:09	20:36
7/13	99.9	21:10	5:42	6:10	20:35

Date	Time	Temp (°F)	Sky[5]	Wind[6]	Comments
7/12	20:36	78	0	0	
7/12	21:36	70	0	0	
7/12	22:36	67	0	0	
7/12	23:36	66	0	0	
7/12	00:36	65	0	0	
7/12	01:36	64	0	0	
7/13	20:35	76	0	0	
7/13	21:35	68	0	0	
7/13	22:35	66	0	0	
7/13	23:35	64	0	0	
7/13	00:35	63	0	0	
7/13	01:35	62	0	0	

Transmitters

Band #	Band #	Band #
Freq.	Freq.	Freq.
Brand	Brand	Brand
Weight	Weight	Weight
# Days	# Days	# Days

Date	Time Nets Up	Time Nets Down
7/12/22	20:30	01:36
7/13/22	20:30	01:35

[1]Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

[2]Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

[3]Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

[4]Sample: Swab: S; Wing-Punch: WP; Hair Sample: H; Guano: G

[5]Sky Code: 0-Clear, 1-Few Clouds, 2-Partly Cloudy, 3-Cloudy or Overcast, 4-Fog or Smoke, 5-Drizzle or Light Rain, 6-Heavy Rain or Thunderstorm

[6]Beaufort Wind Scale: 0-Calm (<1MPH), 1-Light Air (1-3 MPH) 2-Light Breeze (4-6 MPH) 3-Gentle Breeze (7-10 MPH), 4-Moderate Breeze (11-16 MPH)

Dominant Tree Species

1. Black Oak
2. Green Ash
3. White Oak
4. Basswood
5. Sycamore
6. Hackberry

Copperhead Consulting Ph:859-925-9012 Please return to: P.O. Box 73, Paint Lick, KY 40461

Site No. 1252 Site 1 Project.Phase# 02 Project Name ARDOT Hwy 412 - Hwy 112 Bypass Dates 12-13 July 2022

	A	B	C	D	E	F	G	H	I	J	K
Dates/Net Set Height X Length (m)											
Dates	12-13 July	12-13 July									
Height	5.2	5.2									
Length	9	6									
Net Set By Habitat											
Corridor											
Road Rut											
Creek											
River											
Pond	X	X									
Forest Gap											
Cave											
Mine											
Tree											
Other: list	Pool	Pool									
Net Set GPS Location (UTM or LAT/LONG)											
Lat (E)											
Long (W)											

Potential Listed Bat Habitat at Site:

1 **Roost habitat**: **1. Poor**: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate**: Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal**: Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

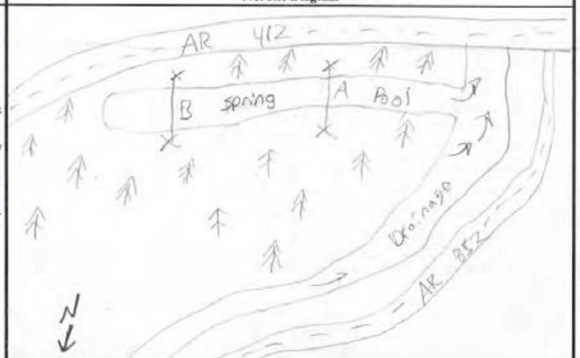
3 **Water Resources**: **1. Poor**: bat drinking resources not present at the site. **2. Moderate**: Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal**: Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the

2 **Forest Structure**: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
1. Poor: Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate**: some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal**: Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

3 **Land Cover**: **1. Poor**: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Net Site Diagram



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Mist Netting Data Form 2022 Sheet____ of ____

Site No. 2 Project.Phase# 1252.08 Project Name ARDOT HWY 412 – HWY 112 BYPASS Dates 07/14/2022 – 7/16/2022

Site Location Forested area at the NW junction of HWY 412 and Old HWY 68 Habitat Type[1] Upland Forest

County Washington State AR Permitee Cumbera + Bova Technician(s) Katherine Bauska

Lat/Lon or UTM (circle one): N/Easting 36.178275 8 W/Northing 94.293814 UTM Zone ____

COPPERHEAD

#	Date	Time	Species[2]	Age	Sex[3]	Repro[3]	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freeq.	Sample[4]	Comments
1	07/14	21:10	LABO	J	F	NR	9.0	40	A	2.0	0	—	—	—	—
2	07/14	21:10	LABO	A	F	PL	—	—	A	2.5	—	—	—	—	DUM K Bauska
1	07/16	01:13	LABO	J	M	NR	7.5	40	B	2.0	0				

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
07/14	97	2200	0653	0618	2035
07/16	85	2313	0925	0611	2034

Date	Time	Temp (°F)	Sky[5]	Wind[6]	Comments
07/14	2035	86	0	0	
07/14	2135	85	0	0	
07/14	2235	82	0	0	
07/14	2335	81	0	1	
07/14	0035	80	0	1	
07/14	0135	80	0	1	
07/16	2024	87	0	0	
07/16	2134	86	0	0	
07/16	2234	85	0	0	
07/16	2334	95	3	1	
07/16	0034	85	3	1	
07/16	0134	83	3	1	

Transmitters		
Band #	Band #	Band #
Freq.	Freq.	Freq.
Brand	Brand	Brand
Weight	Weight	Weight
# Days	# Days	# Days

Date	Time Nets Up	Time Nets Down
07/14/2022	2035	0135
07/16/2022	2034	0134

[1]**Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

[2]**Species Abbreviations:** *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus semiotus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

[3]**Other Abbreviations:** Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

[4]**Sample:** Swab: S; Wing-Punch: WP; Hair Sample: H; Guano: G

[5]**Sky Code:** 0-Clear, 1-Few Clouds, 2-Partly Cloudy, 3-Cloudy or Overcast, 4-Fog or Smoke, 5-Drizzle or Light Rain, 6-Heavy Rain or Thunderstorm

[6]**Beaufort Wind Scale:** 0-Calm (<1MPH), 1-Light Air (1-3 MPH) 2-Light Breeze (4-6 MPH) 3-Gentle Breeze (7-10 MPH), 4-Moderate Breeze (11-16 MPH)

Dominant Tree Species

1. Quercus alba
2. Carya tomentosa
3. Pinus serotina
4. Fraxinus pennsylvanica
5.
6.

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Site No. 2 Project.Phase# 1252.08 Project Name ARDOT HWY 412 – HWY 112 Bypass Dates 07/14/2022 – 7/16/2022

	XB	XA	C	D	E	F	G	H	I	J	K
Dates/Net Set Height X Length (m)											
Dates	7/14-16	7/14-16									
Height	5.2	5.2									
Length	12.0	9.0									
Net Set By Habitat											
Corridor											
Road Rut											
Creek											
River											
Pond											
Forest Gap	X	X									
Cave											
Mine											
Tree											
Other: list											
Net Set GPS Location (UTM or LAT/LONG)											
Lat (E)	36.178228	36.178285									
Long (W)	-94.294720	-94.29341									

Potential Listed Bat Habitat at Site:

2 **Roost habitat**: **1. Poor**: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate**: Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal**: Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1 **Water Resources**: **1. Poor**: bat drinking resources not present at the site. **2. Moderate**: Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal**: Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the

2 **Forest Structure**: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
1. Poor: Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate**: some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal**: Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

1 **Land Cover**: **1. Poor**: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Net Site Diagram

Copperhead Consulting Ph: 859-925-9012 Please Return to P.O. Box 73, Paint Lick KY, 40461

Mist Netting Data Form 2022 Sheet____ of ____

Site No. 3 Project.Phase# 1252.02 Project Name ARDOT Hwy 412-Hwy 112 Bypass Dates 7/18 & 7/26 2022

Site Location Field and woodlot north of AR 904 Habitat Type[1] Field Edge

County Washington State AR Permitee Piper Roby Technician(s) Ashley Hammer & Mackenzie Alexander

Lat/Lon or UTM (circle one): N/Easting 36.187025046 W/Northing -94.278686018 UTM Zone ____

COPPERHEAD ENVIRONMENTAL CONSULTING

#	Date	Time	Species[2]	Age	Sex[3]	Repro[3]	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Sample[4]	Comments
1	7/18	21:12	LABO	J	F	NR	10.0	41	A	5.5	0				
2	7/18	21:27	LABO	J	F	NR	8.0	41	A	5.0	0				
	7/26						NO BATS								

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
7/18	67	—	23:34	06:13	20:33
7/26	4	04:07	19:31	06:19	20:27

Date	Time	Temp (°F)	Sky[5]	Wind[6]	Comments
7/18	2033	82.6	1	1	
7/18	21:33	81.3	0	1	
7/18	22:33	80.6	0	1	
7/18	23:33	79.2	0	1	
7/18	00:33	78.3	0	1	
7/18	01:33	77.6	0	1	
7/26	20:27	91.5	0	1	
	21:27	88.1	0	1	
	22:27	84.0	0	1	
	23:27	84.2	0	1	
	00:27	81.3	0	1	
	01:27	82.7	0	1	

Transmitters		
Band #	Band #	Band #
Freq.	Freq.	Freq.
Brand	Brand	Brand
Weight	Weight	Weight
# Days	# Days	# Days

Date	Time Nets Up	Time Nets Down
7/18	20:33	01:33
7/26	20:27	01:27

[1]**Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

[2]**Species Abbreviations:** *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

[3]**Other Abbreviations:** Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

[4]**Sample:** Swab: S; Wing-Punch: WP; Hair Sample: H; Guano: G

[5]**Sky Code:** 0-Clear, 1-Few Clouds, 2-Partly Cloudy, 3-Cloudy or Overcast, 4-Fog or Smoke, 5-Drizzle or Light Rain, 6-Heavy Rain or Thunderstorm

[6]**Beaufort Wind Scale:** 0-Calm (<1MPH), 1-Light Air (1-3 MPH) 2-Light Breeze (4-6 MPH) 3-Gentle Breeze (7-10 MPH), 4-Moderate Breeze (11-16 MPH)

Dominant Tree Species

1. Ulmus rubra
2. Acer rubrum
3. Carya glabra
4. Quercus velutina
5.
6.

Copperhead Consulting Ph:859-925-9012 Please return to: P.O. Box 73, Paint Lick, KY 40461

Site No. 3 Project.Phase# 1252.02 Project Name ARDOT Hwy 412-Hwy 112 Bypass Dates 7/18 & 7/26/2022

	A	B	C	D	E	F	G	H	I	J	K
Dates/Net Set Height X Length (m)											
Dates	7/18-7/26	7/18 & 7/26									
Height	7.8	5.2									
Length	9	6									
Net Set By Habitat											
Corridor											
Road Rut											
Creek											
River											
Pond											
Forest Gap		X									
Cave											
Mine											
Tree											
Other: list	Field edge										
Net Set GPS Location (UTM or LAT/LONG)											
Lat (E)	36.18705	36.18703									
Long (W)	-94.27865	-94.27869									

Potential Listed Bat Habitat at Site:

2 **Roost habitat**: **1. Poor**: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate**: Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal**: Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1 **Water Resources**: **1. Poor**: bat drinking resources not present at the site. **2. Moderate**: Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal**: Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the

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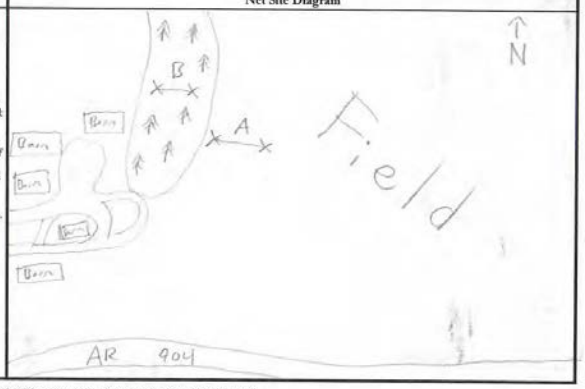
2 **Land Cover**: **1. Poor**: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Net Site Diagram



Copperhead Consulting Ph: 859-925-9012 Please Return to P.O. Box 73, Paint Lick KY, 40461

Mist Netting Data Form 2022 Sheet ___ of ___

Site No. 4 Project.Phase# 12.52.02 Project Name ARDOT HWY 412 - HWY 112 BYPASS Dates JULY 12,13 2022

Site Location BRUSH CREEK TRIBUTARY NORTH OFF OF FOSTER LANE Habitat Type[1] CREEK/RIPARIAN

County WASHINGTON State AR Permitee P. ROBY Technician(s) M. ANGEL

Lat/Lon or UTM (circle one): N/Easting 36.19082 W/Northing -94.27206 UTM Zone —

COPPERHEAD ENVIRONMENTAL CONSULTING

#	Date	Time	Species[2]	Age	Sex[3]	Repro[3]	Mass (g)	FFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Sample[4]	Comments
1	JULY 12	2222	MYGR	J	M	NR	10.0	42	A	1	D	—	—	—	—
2	↓	2316	MYGR	J	M	NR	10.0	43	A	0.5	D	—	—	—	—
1	July 13	2220	LABO	J	M	NR	7.5	39	C	2.5	D	—	—	—	—
2	↓	2322	MYGR	J	M	NR	9.0	42	C	1.5	D	—	—	—	—

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
JULY 12	99.2	2009	0430	0608	2035
JULY 13	97.8	2010	0538	0609	2035

Date	Time	Temp (°F)	Sky[5]	Wind[6]	Comments
JULY 12	2035	73	1	0	—
	2135	69	1	0	—
	2235	66	1	0	—
	2335	65	1	0	—
	0035	64	0	0	—
↓	0135	63	0	0	—
JULY 13	2035	71	0	0	—
	2135	67	0	0	—
	2235	64	0	0	—
	2335	62	0	0	—
	0035	61	0	0	—
↓	0135	61	0	0	—

Transmitters

Band #	Band #	Band #
Freq.	Freq.	Freq.
Brand	Brand	Brand
Weight	Weight	Weight
# Days	# Days	# Days

Date	Time Nets Up	Time Nets Down
JULY 12, 2022	2035	0135
JULY 13, 2022	2035	0135

[1]**Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

[2]**Species Abbreviations:** *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis lebii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

[3]**Other Abbreviations:** Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

[4]**Sample:** Swab: S; Wing-Punch: WP; Hair Sample: H; Guano: G

[5]**Sky Code:** 0-Clear, 1-Few Clouds, 2-Partly Cloudy, 3-Cloudy or Overcast, 4-Fog or Smoke, 5-Drizzle or Light Rain, 6-Heavy Rain or Thunderstorm

[6]**Beaufort Wind Scale:** 0-Calm (<1MPH), 1-Light Air (1-3 MPH) 2-Light Breeze (4-6 MPH) 3-Gentle Breeze (7-10 MPH), 4-Moderate Breeze (11-16 MPH)

Dominant Tree Species

1. ACER NEGUNDO
2. ALBIZA JULIBRISSIN
3. JUGLANS NIGRA
4. ULMUS AMERICANA
5. PLATANUS OCCIDENTALIS
6.

Copperhead Consulting Ph:859-925-9012 Please return to: P.O. Box 73, Paint Lick, KY 40461

Site No. 4 Project.Phase# 12.52.02 Project Name ARDOT HWY 412-HWY 112 BYPASS Dates JULY 12,13 2022

	A	B	C	D	E	F	G	H	I	J	K
Dates/Net Set Height X Length (m)											
Dates	JULY 12,13	JULY 12	JULY 13								
Height	5.2 m	5.2 m	5.2 m								
Length	6 m	9 m	12 m								
Net Set By Habitat											
Corridor		X									
Road Rut											
Creek	X										
River											
Pond											
Forest Gap											
Cave											
Mine											
Tree											
Other: list			FOREST EDGE								
Net Set GPS Location (UTM or LAT/LONG)											
Lat (E)	36.1909	36.19086	36.19086								
Long (W)	-94.2771	-94.27712	-94.27712								

Potential Listed Bat Habitat at Site:

2 **Roost habitat**: **1. Poor**: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate**: Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal**: Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

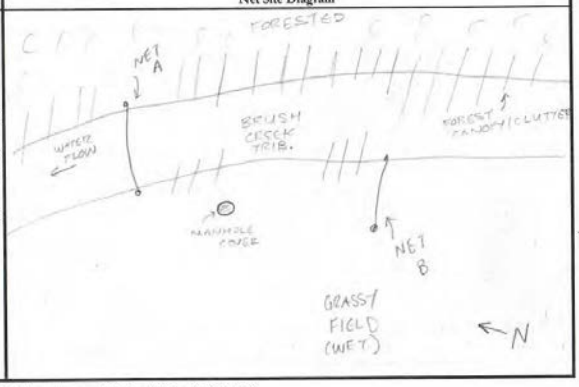
3 **Water Resources**: **1. Poor**: bat drinking resources not present at the site. **2. Moderate**: Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal**: Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the

2 **Forest Structure**: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
1. Poor: Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate**: some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal**: Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

1 **Land Cover**: **1. Poor**: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Net Site Diagram



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Mist Netting Data Form 2022

Sheet____ of ____

Site No. 5 Project.Phase# .02 Project Name ARDOT Hwy 412-Hwy 112 Bypass Dates 07/14-15/2022

Site Location East Side of Driveway for 846/8512 Javello Rd Habitat Type[1] Upland forest

County Washington State AR Permitee Piper Roby Technician(s) Mackenzie Alexander

Lat/Lon or UTM (circle one): N/Easting 36.1888503 W/Northing -94.258793 UTM Zone —

COPPERHEAD ENVIRONMENTAL CONSULTING

#	Date	Time	Species[2]	Age	Sex[3]	Repro[3]	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Sample[4]	Comments

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
7/14	99%	2157	0652	0610	2034
7/15	95%	2238	0809	0611	2034

Date	Time	Temp (°F)	Sky[5]	Wind[6]	Comments
07/14	2034	81	0	0	
07/14	2134	77	0	0	
07/14	2234	75	0	0	
07/14	2334	75	0	0	
07/14	0034	73	0	0	
07/14	0134	74	0	0	
07/15	2034	82	0	0	
07/15	2134	78	0	0	
	2234	76	0	0	
	2334	74	0	0	
	0034	76	0	0	
	0134	74	0	0	

Transmitters

Band #	Band #	Band #
Freq.	Freq.	Freq.
Brand	Brand	Brand
Weight	Weight	Weight
# Days	# Days	# Days

Date	Time Nets Up	Time Nets Down
07/14/2022	2034	0134
07/15/2022	2034	0134

[1]Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

[2]Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

[3]Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

[4]Sample: Swab: S; Wing-Punch: WP; Hair Sample: H; Guano: G

[5]Sky Code: 0-Clear, 1-Few Clouds, 2-Partly Cloudy, 3-Cloudy or Overcast, 4-Fog or Smoke, 5-Drizzle or Light Rain, 6-Heavy Rain or Thunderstorm

[6]Beaufort Wind Scale: 0-Calm (<1MPH), 1-Light Air (1-3 MPH) 2-Light Breeze (4-6 MPH) 3-Gentle Breeze (7-10 MPH), 4-Moderate Breeze (11-16 MPH)

Dominant Tree Species

1. Quercus stellata
2. Ulmus rubra
3. Celtis occidentalis
4. Juglans nigra
5.
6.

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Site No. 5 Project.Phase# .02 Project Name ARDOT Hwy 412-Hwy 112 Bypass Dates 07/14/2022

	A	B	C	D	E	F	G	H	I	J	K
Dates/Net Set Height X Length (m)											
Dates	14-15 July	14-15 July									
Height	5.2	5.2									
Length	6	6									
Net Set By Habitat											
Corridor											
Road Rut											
Creek											
River											
Pond											
Forest Gap		X									
Cave											
Mine											
Tree											
Other: list	forest edge										
Net Set GPS Location (UTM or LAT/LONG)											
Lat (E)	36.1888628	36.1888656									
Long (W)	94.2587861	94.2587783									

Potential Listed Bat Habitat at Site:

1 **Roost habitat**: **1. Poor**: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate**: Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal**: Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1 **Water Resources**: **1. Poor**: bat drinking resources not present at the site. **2. Moderate**: Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal**: Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the

1 **Forest Structure**: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
1. Poor: Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate**: some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal**: Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2 **Land Cover**: **1. Poor**: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Net Site Diagram

Copperhead Consulting Ph: 859-925-9012 Please Return to P.O. Box 73, Paint Lick KY, 40461

Mist Netting Data Form 2022 Sheet 1 of 1

Site No. 6 Project.Phase# 1252.08 Project Name ARDOT HWY 412-HWY 112 Bypass Dates 07/17/2022 - 07/18/2022

Site Location Woodlot north of Millsap Road Habitat Type[1] Upland Forest

County Washington State AR Permitee Chris Leftwich Technician(s) Katherine Bouska

Lat/Lon or UTM (circle one): N/Easting 36.19695 W/Northing -94.24793 UTM Zone

COPPERHEAD

#	Date	Time	Species[2]	Age	Sex[3]	Repro[3]	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Sample[4]	Comments
1	07/17	2055	LABO	A	F	L	15.5	41	B	1.5	0	—	—	—	—
1	7/18	2115	LABO	J	F	NR	7.5	42	A	2.0	0	—	—	—	—
2	7/18	0035	LABO	J	M	NR	8.75	38	B	2.5	0	—	—	—	—

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
07/17	76	2341	1035	0611	2034
07/18	66	0029	1138	0612	2033

Date	Time	Temp (°F)	Sky[5]	Wind[6]	Comments
07/17	2024	77	3	1	
07/17	2134	73	3	2	
07/17	2234	73	1	1	
07/17	2334	72	0	1	
07/17	0034	73	2	1	
07/17	0134	73	3	1	
07/18	2033	82	1		
07/18	2133	81	1	1	
07/18	2233	81	1	2	
07/18	2333	79	0	3	
07/18	0033	75	0	2	
07/18	0133	77	0	2	

Transmitters

Band #	Band #	Band #
Freq.	Freq.	Freq.
Brand	Brand	Brand
Weight	Weight	Weight
# Days	# Days	# Days

Date	Time Nets Up	Time Nets Down
07/17/2022	2034	0134
07/18/2022	2033	0133

[1]**Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

[2]**Species Abbreviations:** *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

[3]**Other Abbreviations:** Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

[4]**Sample:** Swab: S; Wing-Punch: WP; Hair Sample: H; Guano: G

[5]**Sky Code:** 0-Clear, 1-Few Clouds, 2-Partly Cloudy, 3-Cloudy or Overcast, 4-Fog or Smoke, 5-Drizzle or Light Rain, 6-Heavy Rain or Thunderstorm

[6]**Beaufort Wind Scale:** 0-Calm (<1MPH), 1-Light Air (1-3 MPH) 2-Light Breeze (4-6 MPH) 3-Gentle Breeze (7-10 MPH), 4-Moderate Breeze (11-16 MPH)

Dominant Tree Species

1. Ulmus americana
2. Sassifras albidum
3. Platanus occidentalis
4. Salix nigra
5.
6.

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Site No. 6 Project.Phase# 1252.08 Project Name ARDOT HWY 412-HWY 112 BYPASS Dates 07/17/2022 ; 7/18/2022

	A	B	C	D	E	F	G	H	I	J	K
Dates/Net Set Height X Length (m)											
Dates	07/17; 7/18	07/17; 7/18									
Height	5.2	5.2									
Length	6.0	9.0									
Net Set By Habitat											
Corridor	X	X									
Road Rut											
Creek											
River											
Pond											
Forest Gap											
Cave											
Mine											
Tree											
Other: list											
Net Set GPS Location (UTM or LAT/LONG)											
Lat (E)	36.19706	36.19696									
Long (W)	-94.24784	-94.24843									

Potential Listed Bat Habitat at Site:

0 **Roost habitat**: **1. Poor**: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate**: Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal**: Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

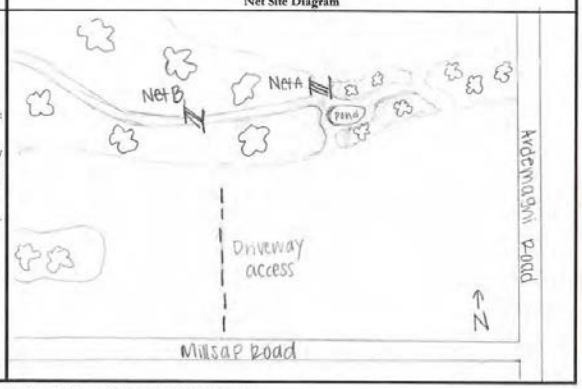
2 **Water Resources**: **1. Poor**: bat drinking resources not present at the site. **2. Moderate**: Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal**: Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the

2 **Forest Structure**: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
1. Poor: Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate**: some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal**: Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

1 **Land Cover**: **1. Poor**: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: Pond surface 100% covered with duckweed

Net Site Diagram



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Mist Netting Data Form 2022 Sheet___ of ___

Site No. 7 Project.Phase# 1252.08 Project Name ARDOT HWY 412 – HWY 112 Bypass Dates 07/15/2022

Site Location Brush Creek south of the intersection of HWY 60 and Elm Valley Ln Habitat Type[1] Creek/riparian

County Washington State AR Permitee Mark Gumbert Technician(s) Katherine Bouska (07/15) Mackenzie Alexander (07/16)

Lat/Lon or UTM (circle one): N/Easting 36.20576 W/Northing -94.24944 UTM Zone —

COPPERHEAD

#	Date	Time	Species[2]	Age	Sex[3]	Repro[3]	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type___	Freq.	Sample[4]	Comments
1	07/15	2250	MYGR	J	M	NR	9.6	44	A	0	0	—	—	—	—
2	07/15	2315	MYGR	J	F	NR	10.5	45	A	0.5	0	—	—	—	—
3	07/15	0015	MYGR	A	F	PL	11.9	40	A	0	1	—	—	—	—
4	07/16	2155	MYGR	A	F	PL	11.1	42	A	2	0	—	—	—	—
5	07/16	2155	MYGR	A	F	PL	10.7	43	A	.5	0	—	—	—	—
6	07/16	2210	MYGR	J	M	NR	9.1	42	A	.5	0	—	—	—	—
7	07/16	2210	MYGR	J	F	NR	8.2	41	A	.5	0	—	—	—	—
8	07/16	2215	MYGR	J	F	NR	10.3	42	A	0	0	—	—	—	—
9	07/16	2245	MYGR	J	M	NR	10.1	42	A	0	0	—	—	—	—
10	07/16	2310	MYGR	J	M	NR	10.1	41	A	0	0	—	—	—	—
11	07/16	2315	MYGR	J	M	NR	9.4	41	A	0	0	—	—	—	—
12	07/16	0045	MYGR	J	M	NR	9.8	41	A	.5	0	—	—	—	—

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
07/15	92	2240	0810	0610	2035
07/16	88	2312	0923	0612	2035

Date	Time	Temp (°F)	Sky[5]	Wind[6]	Comments
07/15	2035	84	0	0	
07/15	2135	77	0	0	
07/15	2235	75	0	0	
07/15	2335	73	0	0	
07/15	0035	73	0	0	
07/15	0135	73	0	0	
07/16	2035	85	2	0	
	2135	82	2	0	
	2235	79	0	0.	
	2335	79	0	0	
	0035	83	0	2	
*	0135	79	2	[illegible]	

Transmitters		
Band #	Band #	Band #
Freq.	Freq.	Freq.
Brand	Brand	Brand
Weight	Weight	Weight
# Days	# Days	# Days

Date	Time Nets Up	Time Nets Down
07/15/2022	2035	0135
07/16/2022	2035	0135

[1]Habitat Type: Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

[2]Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

[3]Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating PL; Testes Descended: TD; Non Repro: N; Unknown: U

[4]Sample: Swab: S; Wing-Punch: WP; Hair Sample: H; Guano: G

[5]Sky Code: 0-Clear, 1-Few Clouds, 2-Partly Cloudy, 3-Cloudy or Overcast, 4-Fog or Smoke, 5-Drizzle or Light Rain, 6-Heavy Rain or Thunderstorm

[6]Beaufort Wind Scale: 0-Calm (<1MPH), 1-Light Air (1-3 MPH) 2-Light Breeze (4-6 MPH) 3-Gentle Breeze (7-10 MPH), 4-Moderate Breeze (11-16 MPH)

Dominant Tree Species

1. Acer negundo
2. Ulmus americana
3. Maclura pomifera
4. Fraxinus pennsylvanica
5. Sassafras albidum
6.

Copperhead Consulting Ph:859-925-9012 Please return to: P.O. Box 73, Paint Lick, KY 40461

Site No. 7 Project.Phase# 1252.08 Project Name ARDOT HWY 412 – HWY 112 Bypass Dates 07/15/2022

	A	B	C	D	E	F	G	H	I	J	K
Dates/Net Set Height X Length (m)											
Dates	07/15-16	07/15-16									
Height	5.2	5.2									
Length	9.0	12.0									
Net Set By Habitat											
Corridor		X									
Road Rut											
Creek	X										
River											
Pond											
Forest Gap											
Cave											
Mine											
Tree											
Other: list											
Net Set GPS Location (UTM or LAT/LONG)											
Lat (E)	36.20581	36.20564									
Long (W)	-94.24941	-94.24938									

Potential Listed Bat Habitat at Site:

2 **Roost habitat**: 1. Poor: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) 2. Moderate: Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. 3. Optimal: Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

3 **Water Resources**: 1. Poor: bat drinking resources not present at the site. 2. Moderate: Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. 3. Optimal: Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the

2 **Forest Structure**: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
1. Poor: Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging 2. Moderate: some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. 3. Optimal: Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

1 **Land Cover**: 1. Poor: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments: Poor stream corridor with nice pinchpoints.

Net Site Diagram

Copperhead Consulting Ph: 859-925-9012 Please Return to P.O. Box 73, Paint Lick KY, 40461

Mist Netting Data Form 2017

7/16/2022 Sheet 1 of 1

Site No. 1252 site 8 Project.Phase# 1252.02 Project Name ARDOT HWY 412 - HWY 112 BYPASS Dates 7/14/2022

Site Location Woodlot NE of Trails End Ranch Rd Habitat Type* Upland Forest

County Benton State AR Permitee T. WETZEL, C. LEFTWICH Technician(s) Ashley Hammer, M. ANGEL

Lat/Lon or UTM (circle one): N/Easting 36.22400 W/Northing 94.25166 UTM Zone — Datum WGS-84

COPPERHEAD ENVIRONMENTAL CONSULTING

#	Date	Time	Species	Age	Sex	Repro	Mass (g)	RFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Comments
1	7/14	2300	MYGR	A	F	PL	11.0	44	B	3.0	0	—	—	mites
2	7/14	2340	MYGR	J	M	NR	9.75	43	A	1.5	0	—	—	—
	7/15	No Bats												

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
7/14	98	21:54	16:55	6:10	20:34
7/16	95	23:18	09:24	06:11	20:33

Date	Time	Temp (°F)	Sky	Wind	Comments
7/14	20:34	87	0	0	—
7/14	21:34	85	0	0	—
7/14	22:34	84	0	0	—
7/14	23:34	85	0	2	—
7/14	00:34	82	0	2	—
7/14	01:34	81	0	2	—
7/15	2030	86	2	0	—
7/15	2130	86	2	0	—
7/15	2230	84	2	1	—
7/15	2330	82	3	2	—
7/16	0030	84	3	2	—
7/16	0130	77	3	2	—

Sky Code

0	Clear
1	Few Clouds
2	Partly Cloudy
3	Cloudy or overcast
4	Fog or smoke
5	Drizzle or light rain
6	Heavy rain - thunder storm

Beaufort Wind Scale

0	Calm: <1 mph
1	Light air: 1-3 mph
2	Light breeze: 4-6 mph
3	Gentle breeze: 7-10 mph
4	Moderate breeze: 11-16 mph

Species Abbreviations: *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

Other Abbreviations: Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

*** Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

Site No. 8 Project.Phase# 1252.02 Project Name ARDOT HWY 412-HWY 112 BYPASS Dates 7/14/2022 7-16-2022

Net Site Diagram

Net height x net length (m)			Dates
A =	5.2	x 9	7/14; 9/15
B =	5.2	x 6	7/14; 9/15
C =		x	
D =		x	
E =		x	
F =		x	

Net Set GPS Location (UTM or Lat/Long)		
A =	36.22403	-94.25146
B =	36.22409	-94.25132
C =		
D =		
E =		
F =		

Transmitters			
Band#		Band#	
Freq.		Freq.	
Brand		Brand	
Weight		Weight	
#days		#days	

Net Set by Habitat						
Habitat	A	B	C	D	E	F
Corridor	X	X				
Road Rut						
Creek						
River						
Pond						
Forest Gap						
Cave						
Mine						
Tree						
Other: list						

Date	Time nets up	Time nets down
7/14	20:34	0134
7/16	2053	0133

Dominant Vegetation

1. Pinus serotina
2. Quercus alba
3. Carya tomentosa
4. [redacted]
5.
6.

Potential listed bat habitat at site:

3 **Roost habitat**: **1. Poor**: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate**: Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal**: Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1 **Water Resources**: **1. Poor**: bat drinking resources not present at the site. **2. Moderate**: Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal**: Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the majority of the summer. Flyways to resources are available.

3 **Forest Structure**: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
1. Poor: Habitat even aged and young. Trees smaller than 5 inch DBH. Understory growth cluttered and restricts flying/foraging **2. Moderate**: some diversity in age of trees in the stand. Trees 5 to 15 inches present. Understory clutter dominant but not ubiquitous. Trees greater than 15" DBH may be present but rare. **3. Optimal**: Mature forest. Diverse age classes of trees present. Trees > 15 inch DBH frequent. Varying tree height and treefalls allow for frequent small openings and gaps that facilitate bat foraging.

2 **Land Cover**: **1. Poor**: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Mist Netting Data Form 2022 Sheet ____ of ____

Site No. 9 Project.Phase# 1252.02 Project Name ARDOT HWY 412 – HWY 112 BYPASS Dates 17, 18 JULY 2022

Site Location WOODLOT NW OF NEW ROAD CONSTRUCTION NEAR HWY 112 Habitat Type[1] UPLAND FOREST

County BENTON State AR Permitee M. GUMBERT Technician(s) M. ANGEL

Lat/Lon or UTM (circle one): N/Easting 36.72821 W/Northing -94.123665 UTM Zone ____

COPPERHEAD ENVIRONMENTAL CONSULTING

#	Date	Time	Species[2]	Age	Sex[3]	Repro[3]	Mass (g)	FFA (mm)	Net	Height (m)	WDI	Band# Type	Freq.	Sample[4]	Comments
1	17 JULY	0008	MYHU	J	F	NR	6.9	38	B	4.5	0	—	—	—	—
	18JUL		NO BATS CAPTURED												

Date	Moon%	Moon rise	Moon set	Sunrise	Sunset
17 JULY	76	2341	1035	0611	2035
18 JULY	66	0027	1138	0612	2033

Date	Time	Temp (°F)	Sky[5]	Wind[6]	Comments
17 JULY	2033	82	2	1	—
	2133	75	2	1	—
	2233	75	2	0	—
	2333	75	1	0	—
	0033	75	1	0	—
↓	0133	76	0	0	—
18 JULY	2030	90	0	0	—
	2130	84	0	1	—
	2230	82	0	1	—
	2330	81	0	2	—
	0030	80	0	1	—
↓	0130	79	0	1	—

Transmitters		
Band #	Band #	Band #
Freq.	Freq.	Freq.
Brand	Brand	Brand
Weight	Weight	Weight
# Days	# Days	# Days

Date	Time Nets Up	Time Nets Down
17 JULY	2033	0133
18 JULY	2030	0128

[1]**Habitat Type:** Creek/riparian; Bottomland forest; Upland forest; Pond; Cave entrance; Mine portal; Bridge; Structure; Field edge; Open field; Other

[2]**Species Abbreviations:** *Corynorhinus rafinesquii* (CORA); *Corynorhinus t. virginianus* (COVI); *Eptesicus fuscus* (EPFU); *Lasiurus borealis* (LABO); *Lasiurus cinereus* (LACI); *Lasiurus seminolus* (LASE); *Lasionycteris noctivagans* (LANO); *Myotis austroriparius* (MYAU); *Myotis grisescens* (MYGR); *Myotis leibii* (MYLE); *Myotis lucifugus* (MYLU); *Myotis septentrionalis* (MYSE); *Myotis sodalis* (MYSO); *Nycticeius humeralis* (NYHU); *Perimyotis subflavus* (PESU); *Tadarida brasiliensis* (TABR)

[3]**Other Abbreviations:** Male: M; Female: F; Pregnant: P; Lactating: L; Post Lactating: PL; Testes Descended: TD; Non Repro: N; Unknown: U

[4]**Sample:** Swab: S; Wing-Punch: WP; Hair Sample: H; Guano: G

[5]**Sky Code:** 0-Clear, 1-Few Clouds, 2-Partly Cloudy, 3-Cloudy or Overcast, 4-Fog or Smoke, 5-Drizzle or Light Rain, 6-Heavy Rain or Thunderstorm

[6]**Beaufort Wind Scale:** 0-Calm (<1MPH), 1-Light Air (1-3 MPH) 2-Light Breeze (4-6 MPH) 3-Gentle Breeze (7-10 MPH), 4-Moderate Breeze (11-16 MPH)

Dominant Tree Species

1. QUERCUS ALBA
2. CARYA TOMENTOSA
3. CELTIS OCCIDENTALIS
4. PRUNUS SEROTINA
5. ULMUS AMERICANA
6.

Site No. 9 Project.Phase# 1252.02 Project Name ARDOT HWY 412 – HWY 112 BYPASS Dates 17, 18 JULY 2022

	A	B	C	D	E	F	G	H	I	J	K
Dates/Net Set Height X Length (m)											
Dates	17/18 JULY	17,18 JULY									
Height	5.7m	5.7m									
Length	12m	9m									
Net Set By Habitat											
Corridor											
Road Rut											
Creek											
River											
Pond											
Forest Gap	X	X									
Cave											
Mine											
Tree											
Other: list											
Net Set GPS Location (UTM or LAT/LONG)											
Lat (E)	36.72328	36.72797									
Long (W)	-94.125674	-94.123665									

Potential Listed Bat Habitat at Site:

3 **Roost habitat**: **1. Poor**: No or few snags >= ~5" DBH with sloughing bark or other usable roost features (cracks, crevices, etc) **2. Moderate**: Snags with sloughing bark or other roost features present ~5-15 inch DBH within 1000 feet of forested areas. **3. Optimal**: Snags with sloughing bark or other roost features present >~15 inch DBH within 1000 feet of forested areas.

1 **Water Resources**: **1. Poor**: bat drinking resources not present at the site. **2. Moderate**: Ephemeral or intermittent streams or ponded areas present but too cluttered to allow many bats to drink easily or simultaneously. No corridors, openings or canopy gaps allow bats easy access to the resource. **3. Optimal**: Streams or ponds (including road ruts) present that appear to offer drinking resource throughout the

3 **Forest Structure**: (if hardwoods are absent or nearly absent or if stand is monoculture, area automatically qualifies as a 1: poor).
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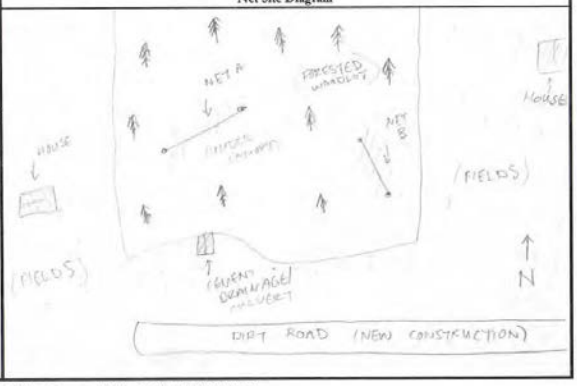
2 **Land Cover**: **1. Poor**: Area surrounding site predominantly un-forested. Few mature trees present not connected to other areas of trees.
2. Moderate: Trees present in the form of small woodlots and wooded fence rows. Little connection to adjacent forested areas.
3. Optimal: Area is largely forested. Wooded stands are connected to other wooded stands via wooded stream, fence row, or other wooded corridor.

Comments:

Net Site Diagram



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
Phone: (501) 513-4470 Fax: (501) 513-4480

In Reply Refer To:
Project Code: 2023-0080096
Project Name: 012326 - Hwy. 412 - Hwy. 112 (Springdale Bypass) (S)

May 10, 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:

Arkansas Ecological Services Field Office
110 South Amity Suite 300
Conway, AR 72032-8975
(501) 513-4470

PROJECT SUMMARY

Project Code: 2023-0080096
Project Name: 012326 - Hwy. 412 - Hwy. 112 (Springdale Bypass) (S)
Project Type: Road/Hwy - New Construction
Project Description: Construct approximately 7 miles of divided four lane highway on new location with a new interchange with NW Arkansas Regional Airport.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.203560100000004,-94.25136603581582,14z

Counties: Benton and Washington counties, Arkansas

ENDANGERED SPECIES ACT SPECIES

There is a total of 14 threatened, endangered, or candidate species on this species list.

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

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

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

---

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
Gray Bat *Myotis grisescens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6329	Endangered
Indiana Bat *Myotis sodalis* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5949	Endangered
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Ozark Big-eared Bat *Corynorhinus (=Plecotus) townsendii ingens* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7245	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

BIRDS

NAME	STATUS
Eastern Black Rail *Laterallus jamaicensis ssp. jamaicensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10477	Threatened
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* There is **proposed** critical habitat for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened

REPTILES

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

FISHES

NAME	STATUS
Ozark Cavefish *Amblyopsis rosae* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6490	Threatened

CLAMS

NAME	STATUS
Neosho Mucket *Lampsilis rafinesqueana* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3788	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRUSTACEANS

NAME	STATUS
Benton County Cave Crayfish *Cambarus aculabrum*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/5011

FLOWERING PLANTS

NAME	STATUS
Missouri Bladderpod *Physaria filiformis*	Threatened

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/5361

CRITICAL HABITATS

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

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

IPAC USER CONTACT INFORMATION

Agency: Arkansas Department of Transportation
Name: mickey matthews
Address: 10324 I-30
City: Little Rock
State: AR
Zip: 72203
Email mickey.matthews@ardot.gov
Phone: 5015692594

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Federal Highway Administration