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Department of
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Forest
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Environmental Assessment

White Rock Mountain Road Relocation Project

Ozark-St. Francis National Forests
Boston Mountain Ranger District
Main Division
Franklin County Arkansas

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1.0 PURPOSE AND NEED FOR ACTION

1.1 INTRODUCTION

The Boston Mountain Ranger District of the USDA Forest Service is proposing relocating a segment of a road on National Forest lands. The existing segment has failed causing part of the road to slide off the ridge into Spirits Creek. The current situation presents a public safety hazard. This proposal is referred to as the ***White Rock Mountain Road Relocation Project***.
(See map below).

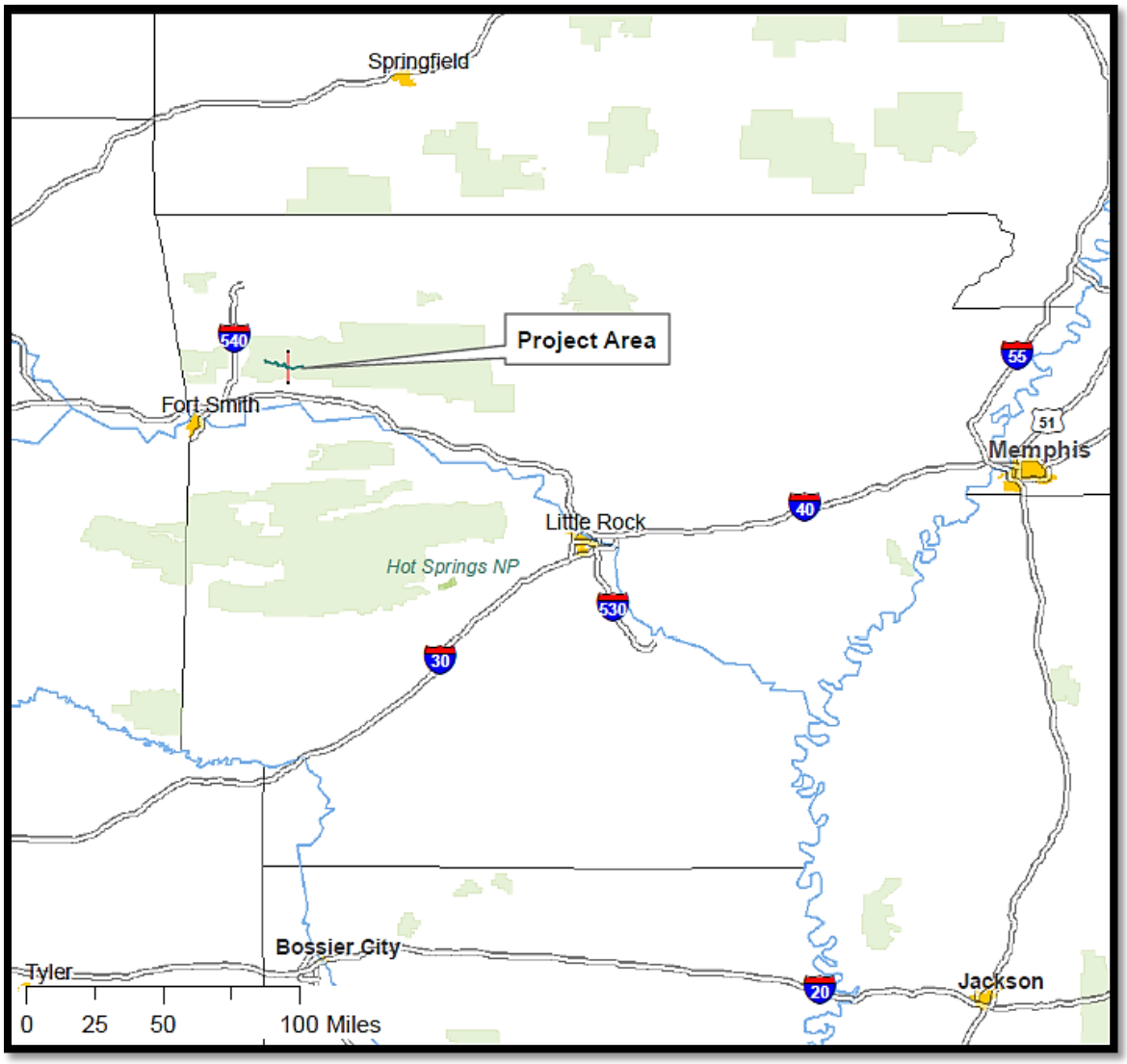

Figure 1. Vicinity Map

This Environmental Assessment (EA) has been prepared in compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321-4347, January 1, 1970) and other relevant federal and state laws and regulations. The EA discloses the

direct, indirect, and cumulative impacts that would result from the proposed action, and alternatives to the proposed action. The document is organized into six sections:

1.0: Purpose and Need for the Action: This section includes detailed information about the project proposal, the purpose and need for the project, the Forest Service's proposal that addresses the purpose and need, and a summary of the public involvement process.

2.0: Comparison of Alternatives: This section provides information on alternatives to the proposal. The section also includes design criteria, or measures that are taken to prevent potential negative effects of an action.

3.0: Affected Environment and Environmental Consequences: In this section the potential environmental impacts of each of the alternatives are examined. The section is organized by the environmental resource being examined.

4.0: Consultation and Coordination: This section provides a list of preparers and agencies consulted during the development of the environmental assessment.

5.0: References: This section provides a list of references and data sources used in the analysis.

6.0: Appendices: The appendices include maps and other information used to support the analysis presented in the EA.

1.1.1 Description of the Area

The project is located in Franklin County on the Main Division of the Boston Mountain Ranger District of the Ozark National Forest on White Rock Mountain Road about five and one half miles west of the intersection at Highway 23 North. It is about two miles west of Grays Springs Recreation Area in Township 12 North Range 27 West sections 30 and 31 (Figure 2) . The area is accessible to publics travelling along the scenic byway of Highway 23 and locals from the Cass community.

White Rock Mountain Road, also known as Cass Road and Forest Service Road 1003 is a much used arterial road running east to west from Highway 23 at Cass in Franklin County to Old Locke Road in Crawford County. The area received a major flood event in the spring of 2008 causing damage to the road surface. These cracks were temporary repaired. Before a permanent repair could be made the forest received another major flood event in the spring of 2011. This event caused major failure to approximately 600 feet of the road causing a slide of much of the road material down slope towards Spirits Creek (Figure 3). At this time the road remains closed for public safety.

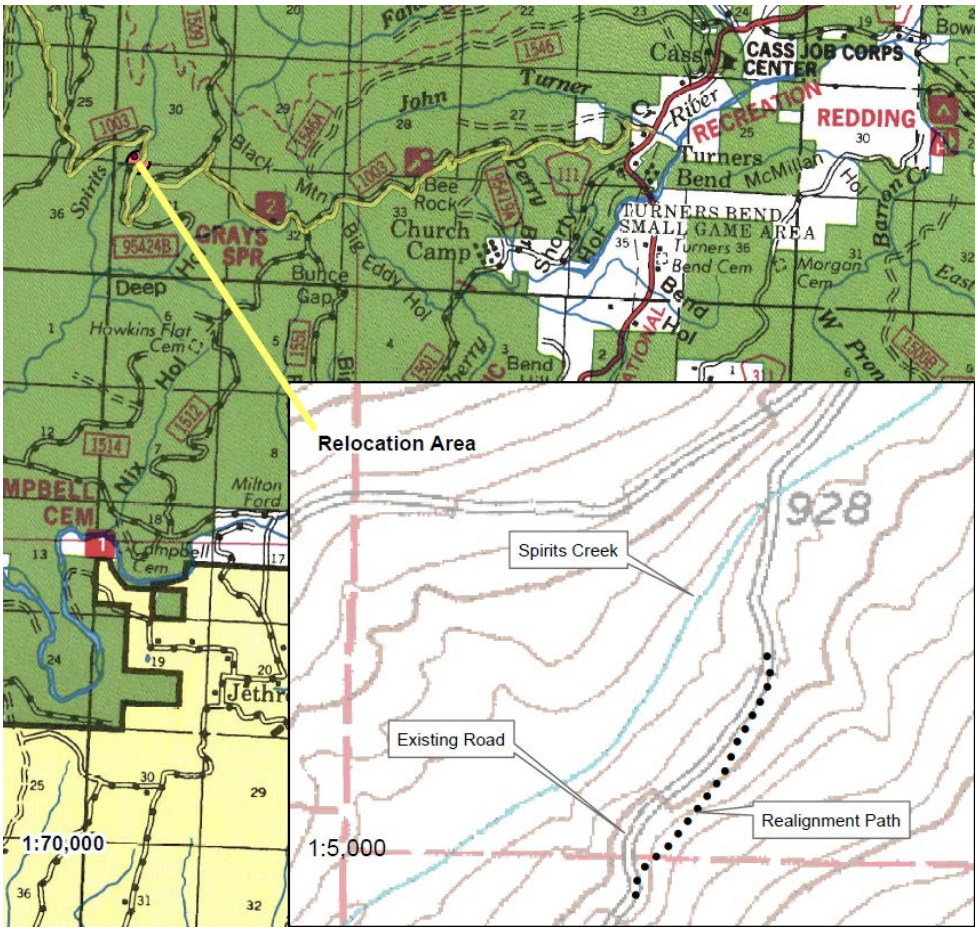

Figure 2. Project Area Detail.

Figure 3. White Rock Mountain Road facing south in May 2011 (left) and in October 2011 (right).

1.1.2 Description of the proposal (Alternative 1)

A 600 feet segment of the road would be relocated approximately 300 feet upslope of the existing road template (see Figure 2 inset for approximate location). The existing slide would be stabilized to protect the riparian area. Trees and brush felled during construction would be piled and burned. The new road surface would be approximately 18 feet wide with ditches on both sides of the road for roadway drainage. Corrugated steel pipe cross drains would be installed and the road would be surfaced using crushed rock. All disturbed areas would be seeded, fertilized and mulched in accordance with the Boston Mountain Seeding Schedule. This work would be done when Emergency Relief of Federal Owned Roads (ERFO) funding is made available from the Eastern Federal Lands (EFL) of the Federal Highways Administration (FHWA).

1.2 PURPOSE AND NEED

1.2.1 Decision to be made

The decision to be made is to approve the management activities as proposed, defer all activities until another time, require additional information from the Interdisciplinary Team if the information presented is not adequate to make a decision, or require the development of an Environmental Impact Statement or other NEPA Document.

1.2.2 Other environmental documents relevant to this analysis

Tiering: The Revised Land and Resources Management Plan (RLRMP) for the Ozark-St. Francis National Forests set the overall guidance for managing the land and resources of the Ozark-St. Francis National Forests. This document is available on the web at: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm8_042809.pdf. The Final Environmental Impact Statement (FEIS) for the RLRMP describes the alternatives and their consequences for revising the LRMP. This document is also available on the web. This EA is tiered to these documents.

1.2.3 Relationship to other laws and regulations

Under the National Forest Management Act (NFMA) regulations, selection of management indicator species (MIS) during development of forest plans is required. MIS are selected because their population changes are believed to indicate the effects of management activities. They are used during planning to help compare effects of alternatives and as a focus for monitoring. Where appropriate, MIS represent the following groups of species (36 CFR 219.19 [a] [1]):

- Threatened and endangered species on state and federal lists
- Species with special habitat needs
- Species commonly hunted, fished or trapped
- Non-game species of special interest
- Species selected to indicate effects on other species of selected major biological communities.

1.3 SCOPING

Scoping is defined by the National Environmental Policy Act as "*an early and open process for determining the scope of issues to be addressed, and for identifying the issues related to a proposed action.*" Scoping continues throughout project planning and analysis.

Scoping for this project began with the mailing of a scoping package containing a description of the proposed action, a map depicting the proposed action, and a comment form. In all, 67 letters were mailed to interested citizens, local and county governments, Native American Tribes and the Arkansas Game and Fish Commission. The notice of the availability of these documents was posted in the *Times Record* on March 12, 2012. A copy of the proposed action letter was posted that same week on the Ozark-St. Francis National Forests website.

We received 2 responses to the scoping letter, one indicating that the commenter had no interest in the project and the other asking about the costs associated with it.

Comment: *What is the cost? Do I understand this to be federal funding for the project? When will it begin?*

Response: *Gave a rough estimate of the cost and mentioned that the work would begin as soon as funds are received from the Federal Highway Administration.* The comments are part of the project file and may be viewed at the district office.

1.4 KEY ISSUES CONSIDERED

The key issues associated with this project were identified through a public "scoping" process, which included input from Forest Service specialists, other government agencies, and private individuals. A Forest Service Interdisciplinary Team (ID Team) reviewed the comments received during the scoping period and determined that there were no issues that could not be addressed through project design or mitigation measures, and therefore no alternatives to the proposed action were developed to respond to issues that were identified in the scoping process.

1.5 APPEAL OPPORTUNITIES

Only those persons who responded during the comment period for this project have legal standing to appeal the decision pursuant to 36 CFR 215.11.

Appeal opportunities are described in detail in the decision notice. The appeal period will last for 45 days beginning the day after the legal notice of the decision is published in the *Times Record.*

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

These alternatives were developed by the Interdisciplinary Team of specialists in response to issues and opportunities identified in the area.

ALTERNATIVE 1 – PROPOSED ACTION

<u>Realignment</u>

Realigning the road above the failure area would consist of reconstructing approximately 0.23 mile of road and 2.10 acres of clearing. The new segment would be constructed using a crown template and minimum 18-foot width. The road would be constructed with v, wing and lead-off ditches to provide roadway and side drainage. Corrugated steel pipe would be installed for cross drainage. Construction slash would be piled, burned and the stumps removed from the project to a designated location. The roadway would be finished to a 6-inch compacted depth with Arkansas Class 5 aggregate.

One existing CCC rock culvert is plugged up with slide material. This culvert would be dismantled on the inlet side and cleaned along with the drain inlet. The cap stones to the culvert would be replaced; new fill material and aggregate placed above the culvert compacted and graded to the designed finish grades. All excess excavated material determined as suitable material would be loaded, hauled and placed on the existing roadway at locations as directed by the engineer. All areas disturbed in the reconstruction phase of this project would be seeded, fertilized and mulched in accordance with the typical Seeding Schedule for the Boston Mountain Ranger District.

<u>Damaged section</u>

The damaged section of roadway would be obliterated. Two earth mounds would be constructed at the intersection of the new alignment and damaged area of the old roadway. The obliterated roadway would be scarified and sloped to drain. Three flat bottom drainage relief structures would be constructed using nonwoven geotextiles and rip rap and excavated down to natural ground to catch water from the corrugated steel

pipes from the new alignment above the slide area, concentrating the water and directing it away from the damaged area.

The entire length of the obliterated roadway and 50 feet of the slide area below the old roadway location would be seeded, fertilized and mulched in accordance with the typical Seeding Schedule for the Boston Mountain Ranger District.

ALTERNATIVE 2 – NO ACTION

This alternative proposes no activity that would move the area toward the desired conditions described in the Forest Plan. No resource activities would be carried out. Routine management outside the scope of the proposed action would continue at the present level including road maintenance, fire protection, and law enforcement.

MANAGEMENT REQUIREMENTS & MITIGATION MEASURES (DESIGN CRITERIA)

In order for this project to proceed; the appropriate mitigation measures and management guidelines would assure that the road system is safe and functional. The action alternative would be designed to reduce adverse impacts in riparian habitats, including both direct and indirect effects resulting from damage to vegetation, increased erosion, increased sedimentation, and disturbance.

Applicable standards and guidelines are found in the Revised Ozark-St. Francis Land and Resources Management Plan (RLRMP), as well as the mitigation measures and management requirements of the following Forest Service Handbooks:

Transportation Management FSH 7720.00
Preconstruction FSH 7709.56
Construction FSH 7709.57
Maintenance FSH 7709.58

Construction specifications would follow Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects FP-03
available at http://flh.fhwa.dot.gov/resources/pse/specs/fp-03/fp-03usc.pdf.

The Best Management Practices (BMP) Guidelines for Water Quality Protection (Arkansas Forestry Commission 2002) would be applied as appropriate for this project, including but not limited to the following:

- Strict erosion and sedimentation controls including but not limited to: timing the work at periods of low stream flow, silt fences to catch sediment while the work is being done and afterwards until vegetative cover is established, and mulch over seeded ground. Best management practices would be followed during this project.
- All disking and seeding work would be done during the growing season and any ground scarified would be revegetated quickly.

General

A biological evaluation (USFS 2012a) has been conducted on all areas proposed for management activities (Appendix B). The list of the species considered is in the project file. Any threatened, endangered or sensitive species (TES) that are found would be protected (FSM 2670.31).

Heritage resources consideration has been given to all acres where site-disturbing activities are proposed. Findings are discussed in the Heritage Resources Section of this EA. Any other sites found during implementation of this project would be examined and necessary mitigation measures prescribed by the Forest Archaeologist (RLRMP p. 4-6).

MONITORING

All activities would be monitored to ensure mitigation measures are applied. Applicable RLRMP monitoring and evaluation requirements (Table 5-1 of the RLRMP) would be implemented as directed within budgetary limitations. These requirements include measures to monitor current and past activities in terms of implementation, effectiveness, and validation monitoring levels.

The effectiveness of BMPs and other measures would be monitored to ensure compliance with the Forest Plan and Clean Water Act. The monitoring program would measure the success of BMPs and help improve future mitigation methods. The monitoring program would also identify unforeseen problems that require remedial measures. This monitoring would involve field measurements and inspections.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Resources that were not analyzed further in this document include vegetation management, air quality and noise, recreation, minerals and special uses, and economics. No effect to these resources is expected due to the extremely localized nature of the project.

Civil rights are implications were considered related to each alternative. This included the effects of the alternatives on minority groups, women and consumers. Civil rights imply the fair and equal treatment under law, both within the agency and in relations with the public. No potentially major civil rights impacts were found related to any alternative. Therefore, a civil rights impact analysis and statement of findings are not required for this project.

The CEQ has released draft guidance on how to consider climate change and greenhouse gases in their environmental analyses for proposed actions. Specifically

"…*if a proposed action would be reasonably anticipated to cause direct emissions of 25,000 metric tons or more of CO_2 equivalent greenhouse gas emissions on an annual basis, agencies should consider this an indicator that a quantitative and qualitative assessment may be meaningful to decision makers and the public.*" This indicator is a minimum level of greenhouse gases that would merit some description in the appropriate analyses. (http://www.whitehouse.gov/sites/default/files/microsites/ceq/20100218-nepa-consideration-effects-ghg-draft-guidance.pdf accessed 22 May 2012). Due to the extremely localized nature of the project, an analysis of climate change was not warranted.

The nature of the project involves the transportation system in a small area. The introduction and description of the proposal in the beginning of this chapter and in sections 1.1.1 and 1.1.2 is sufficient to replace the transportation section which would otherwise be included in an environmental analysis.

3.1 SAFETY AND HUMAN HEALTH

The Forest Service strives to provide visitor experiences that are safe for the public to use and enjoy. The road relocation would be constructed and maintained to a standard that would provide for user safety. Beyond that it is the users' responsibility to make use of the facilities in a safe and prudent manner as well as having appropriate personal protective equipment.

Existing Conditions

White Rock Mountain Road runs east to west from Highway 23 at Cass in Franklin County to Old Locke Road in Crawford County. Two flood events caused major failure to approximately 600 feet of the road causing a slide of much of the road material down slope towards Spirits Creek. At this time the road remains closed for public safety.

Figure 4. Actively eroding section of FS 1003 road.

Effects from Alternative 1

Direct, indirect effect and cumulative effects:

Vehicle traffic would be controlled by speed limits, state vehicle laws, and National Forest regulations. The Forest Service coordinates vehicle traffic control measures with state and law enforcement. Travel would be disrupted during the project period, which is estimated to be approximately one construction season. This alternative would enhance public safety by providing a safer (wider, straighter, and less steep) and more reliable roadway. This alternative would also reduce road closures and future maintenance problems.

Effects from Alternative 2-No Action

Direct, indirect, and cumulative effects: This alternative would not improve the existing conditions (Figure 4) and the road would remain too unsafe for travel by motorized vehicles and would have to remain closed indefinitely.

3.2 SOILS AND WATER

This section addresses how the alternatives may compact and displace soils in the project area and how this may affect stability, erosion, and sedimentation of area streams.

A watershed provides a spatial context into which land management effects can be examined. It can be described as a user-defined point above which all surface water flows. Watersheds are natural divisions of the landscape that include both the waterway and the land that drains to it.

Land managers often use Hydrological Unit Codes (HUCs) to describe watersheds and their relationships to each other. Hydrologic units are drainage areas that are delineated so as to nest into a multi-level hierarchical drainage system. The more digits that are in a hydrologic unit, the smaller the unit. A hydrological unit with eight numbers is referred to as a subbasin (4th level HUC). Units within the subbasin are given an additional two numbers and are referred to as watersheds (5th level HUC). Units with each watershed are given an additional two numbers (total of 12 digits) and are typically called subwatersheds (6th level HUC).

Existing Conditions

The watershed analysis area is in the upper reaches of Spirits Creek which is part of the Spirits Creek subwatershed which in turn makes up a portion of the 5th level Mulberry River watershed (see Appendix A). The analysis area is about 48.35 square miles of which 34 square miles or 70% is Forest Service Lands.

Geology, Land Type Associations, and Soils

The analysis area is in the Boston Mountains physiogeographic province of the Ozark Uplift. Rock layers are sandstone and shale of primarily Pennsylvanian and Atoka age. The landforms in this area feature side slopes and bluffs some of which are very steep. There are also ridge tops as well as flat alluvial areas adjacent to the Mulberry River. Elevation of the area varies from about 2300 feet in the extreme headwaters of Spirits Creek to about 510 feet on the Mulberry River.

Soils of the Allen-Enders association are the most common within this watershed, particularly along Spirits and John Turner Creeks. Soils in the vicinity of the project area are primarily sandy loams.

Figure 5. Upper reaches of Spirits creek view along left (east) bank at point of entry where road side above is failing.

Water

Water quality standards are determined by the Arkansas Pollution Control and Ecology Commission Regulation 2 – Water Quality Standards for Surface Water (accessible at http://www.adeq.state.ar.us/water/branch_planning/wqs_review.htm). The designated uses assigned to the surface waters in the project area are: secondary contract recreation, domestic, industrial and agricultural water supply, seasonal Boston Mountain stream fishery. For surface water where the watershed is greater than 10 mi^2, and all

lakes and reservoirs, the designated uses are the same as above but include primary contact recreation and perennial Boston Mountain fishery.

Land use/cover

High canopy cover predominates the headwater streams of this watershed except where some gaps are created by dead oaks. Spirits Creek itself is primarily forested along the banks with few bare spots except near some road crossings. Riparian vegetation includes multiple seral stages of paw-paw, black cherry, oaks, hickory, and spicebush. (Brown et. al 2003).

The Mulberry River corridor contains a variety of native upland and riparian vegetation communities which support significant biological diversity. These lands historically were cleared for agriculture and sheep farming and there are still effects on the landscape from these practices. Some land is still cleared for agriculture including cattle grazing and poultry production.

Roads

The watershed features many gravel and dirt roads that cross creeks and sometimes run along them, especially in the Mulberry River Corridor and along the lower elevations of Spirits Creek (Brown et al 2003). Unpaved dirt and gravel roads are the main contributors to stream sedimentation in Spirits Creek, along with user-created trails and cleared areas near the channel for campsites.

Effects from Alternative 1

Direct, indirect and cumulative effects: Direct effects to the environment as a result of this alternative would include disturbance to an area of land less than three acres which would involve removing riparian vegetation. Filling in the old roadway with material from the new road cut would lessen the height of the eroding road embankments and decrease the downward slope of the failing segment.

Indirect effects include long term improvements in controlling storm water and associated soil erosion. Erosion within the reclaimed roadbed would return to a natural rate within 5 years of construction. Since the improvements to the road segment would not change the expected use level of the road there are no negative cumulative effects expected from the completion of the project.

Effects from Alternative 2 – No Action

Direct, indirect and cumulative effects: If no action is taken to repair the road segment that has failed there is a possibility of mass wasting of the site which would increase sediment loads to Spiris Creek downstream of the slide. Even with less vehicular traffic, conditions of the stream downstream would not improve significanly. The 1.2 mile segment of Spirits Creek from the slide location down to the confluence with Deep

Hollow is fairly confined with a 2% gradient . Given enough water the channel here functions to transport sediment efficiently downstream. Therefore effects would not be noticed in the vicinity of the slide but would most likely be seen toward the lower reaches of the creek near the confluence with the Mulberry River 4.75 water miles from the slide. Effects of the increased sediment from the slide would be increased due to other sediment sources from trails crossing the stream in many places in the lower reaches.

3.3 BIOLOGICAL RESOURCES

Existing Conditions

Spirits Creek generally flows in a North/South direction from its origin is southwest of Potato Knob Mountain. The upper reaches are parallel to and occasionally bisected by the Ozark Highlands trail. Spirits continues in a meandering southwest direction to its confluence with the Mulberry River for a total length of 8.4 miles. Along the lower reaches the stream is frequently bisected by trails (Brown et al 2003).

Abundant large woody debris, a high entrenchment ratio, and some localized very steep gradients are prominent features of Spirits Creek. Most of the stream goes dry in the summer leaving a few refuge pools. Stream bed material is made up of a variety of sizes of boulders ranging from basketball to bus-sized, along with cobbles and some exposed bedrock. Gravels and fines are rare and are usually only found around side and point bars and the very lowest reaches of the creek near its confluence with the Mulberry River (Brown et al. 2003).

Several fish collections have been made on Spirits Creek from 2002 to 2012 and in the Mulberry River itself. The fish assemblages are typical of the Boston Mountains Ecoregion with minnows, darters, and sunfishes making up most of the collections which are also supplemented by madtoms of the catfish family and suckers. Upper reaches in Spirits Creek tend to become sparse in diversity with only creek chubs and redfin darters often being the only fish species present. The extreme headwaters which are often completely dry in the summer are important habitat for stream favoring amphibians such as plethodontid salamanders and frogs as well as immature aquatic insects and crayfish.

Direct, indirect and cumulative effects: For the effects of this project on animals and plants see the BE in Appendix B.

3.4 HERITAGE RESOURCES

Existing Conditions
The project area was surveyed for cultural resources during fieldwork for the Spud Rock Prescribed burn in 2004. No recorded archeological sites are located near or within the project area. Additionally this location was visited and re-examined by Mary Brennan, District Archeologist, in March and July 2012.

The collapsed road segment is a part of the Gray's Spring Recreation Area Historic District listed on the National Register in 1995. The historic district includes 70 contributing features including those associated with the Gray's Spring Recreation Area, the road template, and rock culverts located along FSR 1003. The road was constructed in 1934-35 by the enrollees of the 748th Company of the Civilian Conservation Corps (CCC), Arkansas District, working out of Cass, Arkansas.

Forest Service Road 1003 had previously been nothing more than a rough trail impassable for vehicular traffic through this section of the Ozark Mountains connecting the communities of Cass to the east and Bidville to the north and west. The improvement of this trail into a planned, graded vehicular roadway intended for use year-round - complete with the necessary drainage culverts and a bridge, as well as its associated picnic area - was one of the earliest recorded projects undertaken by the enrollees from this CCC camp.

Effects from Alternative 1
Direct, indirect, and cumulative effects:
A CCC-constructed culvert is located approximately 300 feet west of the slide area has not been structurally impacted by the slide (figure 6); however debris inside the culvert has become compacted and is blocking 90% of water flow. This debris would be removed during planned activities for this project. Some cap stones would be temporarily removed to provide access to the debris and then replaced.

Gray's Spring Recreation Area is located 2 miles east of the slide area and would not be impacted by activities associated with this project.

Effects from Alternative 2 No Action
Direct, indirect, and cumulative effects: This alternative would have no effect on heritage resources. No additional surveys would be conducted. No sites would be addressed for their National Register of Historic Places.

Figure 6. CCC Culvert.

4.0 LIST OF PREPARERS AND AGENCIES/PERSONS CONSULTED

USDA Forest Service Preparers and Persons Consulted
Jobi Brown – NEPA/Biologist/IDT Leader - Boston Mountain Ranger District
Ricky Adair – Engineering Technician - Boston Mountain Ranger District
Gary McElroy – Engineer, Supervisor's Office, Ozark NF
James Lindsay – Forester- Boston Mountain Ranger District
John Lane – Multiple Resource Assistant – Boston Mountain Ranger District
Mike Hennigan - Timber Management Assistant, Silviculturist - Boston Mountain Ranger District
Rhea Whalen – District Wildlife Biologist - Boston Mountain Ranger District
Mary Brennan - Zone Archeologist- Boston Mountain and Pleasant Hill Ranger Districts
James Bicknell - Minerals and Special Uses - Boston Mountain and Pleasant Hill Ranger Districts
Len Weeks - Forest Soils Scientist – Supervisor's Office, Ozark NF
Rick Monk - Forest Hydrologist – Supervisor's Office, Ozark NF
William Carromero - Forest Ecologist – Supervisor's Office, Ozark NF
Keith Whalen - Forest Fisheries Biologist – Supervisor's Office, Ozark NF
Chip Stokes – Zone GIS Specialist – Boston Mountain and Mount Magazine Ranger Districts, Ozark NF
Other Persons or Agencies, or Governments Consulted
State Historic Preservation Office, Little Rock, AR
U.S. Fish and Wildlife Office, Conway, AR
Arkansas Game and Fish Commission

5.0 REFERENCES

Tiered Documents

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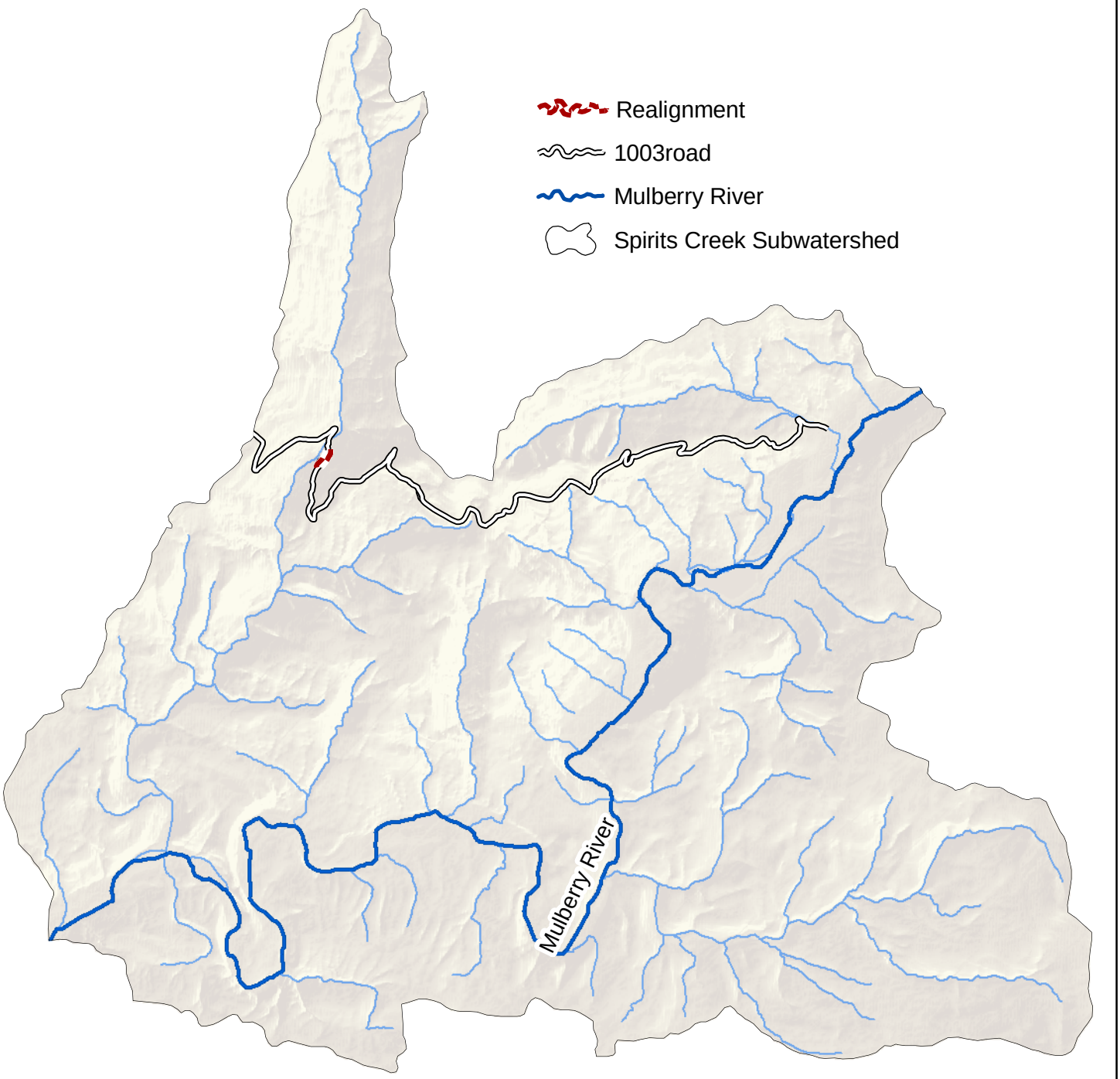
6.0 APPENDICIES

APPENDIX A. Hydrological Setting of White Rock Mountain Road

Appendix A. Hydrological Setting of the White Rock Road Relocation Project



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APPENDIX B. BAE for White Rock Mountain Road Project

BIOLOGICAL ASSESSMENT/EVALUATION

FOR THE

White Rock Mountain Road Relocation Project

Sections 30 & 31, T 12 North, R27 West
Franklin County, Arkansas

Boston Mountain Ranger District, Ozark-St. Francis National Forest

USDA, Forest Service, Southern Region, Region 8

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May 8, 2012

1. INTRODUCTION

a. Purpose and Objective Of This Biological Assessment/Evaluation (BAE)

The Boston Mountain Ranger District is proposing relocating a segment of a road on National Forest lands. The existing segment has failed, causing part of the road to slide off the ridge into Spirits Creek. The current situation presents a public safety hazard. This project will be called the ***White Rock Mountain Road Relocation Project*** for the purpose of this Biological Assessment/Evaluation (BAE). See attached vicinity map in Appendix A and Figure 2 of this BAE. The project area includes sectionsd 30 and 31 in Township 12 North, Range 27 West and is located approximately two milesd west of Gray Springs Recreation Area in Franklin County, Arkansas.

This BAE documents the possible effects of management actions to known and potential populations and habitat of Threatened, Endangered and Sensitive (TES) plant and animal species within the limited areas of proposed disturbance. The area of influence is considered the analysis area for this document. The area of influence is the area which could be affected by any of the project's proposed activities. This size of this area could vary between terrestrial and aquatic habitats.

This BAE is in accordance with direction given in Forest Service Manual 2670, 2670.5, 2672.3, 2672.41 and 2672.42 and guidance from the Ozark-St. Francis National Forests Supervisor's Office. As part of the National Environmental Policy Act decision-making process, the BE provides a review of Forest Service (FS) activities in sufficient detail to determine how a proposed action may affect or will affect any TES species. Objectives of the BAE are as follows:

- Ensure that FS actions do not contribute to loss of viability of any native or desired non-native plant or animal species or contribute to trends toward Federal listing of any species;
- Comply with the requirements of the Endangered Species Act, that actions of Federal agencies not jeopardize or adversely modify critical habitat of Federally-listed species and to document the need for consultation with the USDI Fish & Wildlife Service (F&WS);
- Provide a standard process to ensure that TES species receive full consideration in the decision-making process (decision makers will consider information in this BE to ensure that no species is placed in jeopardy by management actions);
- Meet requirements of FS Manual 2672.43 which provides direction for the preparation of site-specific BEs, including when to conduct an inventory for TES plant and animal species;
- Address effects of management activities to the plant and animal species habitat and/or potential habitat of TES species on the OSNF TES list, and
- Incorporate any mitigation measures specifically addressing any potential impacts from management activities related to known TES habitat or potential habitat.

The best available information on TES species has been used to document this BAE with sources that include data gathered during review of the scientific literature; review of surveys which have been conducted within or adjacent to the areas but which have not been published; conversations with knowledgeable individuals in the academic/scientific/resource management communities; and my best professional judgment and the best available science in an effort to determine which TES species occur

or may occur within the proposed project area.

2. PURPOSE/NEED OF PROPOSED ACTIONS

White Rock Mountain Road, also known as Cass Road and Forest Service Road 1003 is a much used arterial road running east to west from Highway 23 at Cass in Franklin County to Old Locke Road in Crawford County. The area received a major flood event in the spring of 2008 causing damage to the road surface. These cracks were temporary repaired. Before a permanent repair could be made the forest received another major flood event in the spring of 2011. This event caused major failure to approximately 600 feet of the road causing a slide of much of the road material down slope towards Spirits Creek (Figures 1 & 2). At this time the road remains closed for public safety.

Figure 1. White Rock Mountain Road in May 2011 (left) and in October 2011 (right).

Figure 2. White Rock Mountain road in May 2012.

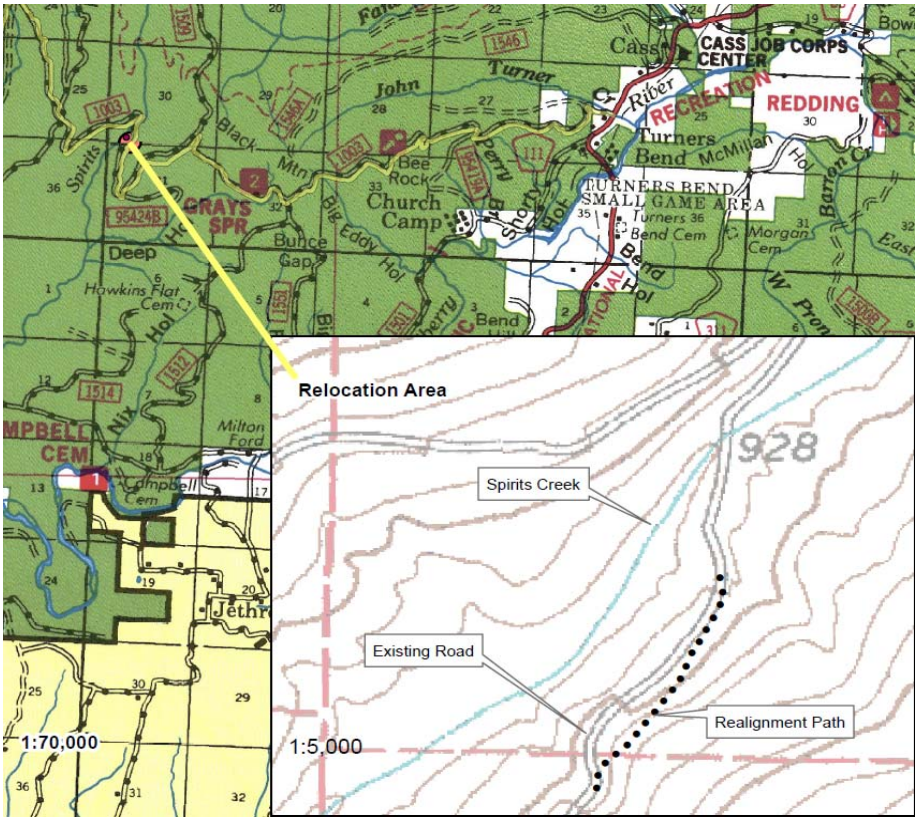

Figure 3. Project Area Vicinity

PROPOSED ACTIONS

ROAD MANAGEMENT

A 600 feet segment of the road would be relocated approximately 300 feet upslope of the existing road template (see Figure 3 for approximate location). The existing slide would be stabilized to protect the riparian area. Trees and brush felled during construction would be piled and burned. The new road surface would be approximately 18 feet wide with ditches on both sides of the road for roadway drainage. Corrugated steel pipe cross drains would be installed and the road would be surfaced using crushed rock. All disturbed areas would be seeded, fertilized and mulched in accordance with the Boston Mountain Seeding Schedule. This work would be done when Emergency Relief of Federal Owned Roads (ERFO) funding is made available from the Eastern Federal Lands (EFL) of the Federal Highways Administration (FHWA).

3. PROPOSED ACTIONS/ALTERNATIVES

Alternative 1 –Proposed Action- A 600 feet segment of the road would be relocated approximately 300 feet upslope of the existing road template (see Figure 2 for approximate location). The existing slide would be stabilized to protect the riparian area. Trees and brush felled during construction would be piled and burned. The new road surface would be approximately 18 feet wide with ditches on both sides of the road for roadway drainage. Corrugated steel pipe cross drains would be installed and the road would be surfaced using crushed rock. All disturbed areas would be seeded, fertilized and mulched in accordance with the Boston Mountain Seeding Schedule. This work would be done when Emergency Relief of Federal Owned Roads (ERFO) funding is made available from the Eastern Federal Lands (EFL) of the Federal Highways Administration (FHWA).

Alternative 2 –No Action- This alternative proposes no new actions for the area. Present conditions will continue and the road will continue to degrade. This will create an immediate ongoing public safety hazard. The road will likely continue to cause increased sedimentation and erosion into Spirits Creek. This alternative is required by the National Environmental Policy Act of 1969 (NEPA), and serves as a baseline for comparison with alternatives considered in detail.

4. CURRENT CONDITIONS/SURVEY INFORMATION

As shown in Figures 1 & 2, the road at this time is impassable and is a public safety hazard. The road is contributing sediment and erosion into Spirits Creek. A site visit was conducted on May 7, 2012 by District Biologist Rhea Whalen. The eroded road was examined and the area adjacent to the road where the new road segment is proposed to be moved was examined. The area was netted for bats in June of 2011 with no threatened, endangered or sensitive species captures. The current condition of the road does not meet the requirements or standards required by the RLRMP to maintain roads to standard and for public safety.

The overstory of the area consists of shorleaf pine, northern red oak and white oak. The mid-story and ground vegetation components and densities in the analysis area are typical of those found in the cover types of the area. The species composition in the mid-story consists of oak, hickory, dogwood, persimmon, sassafras, sweetgum, locust, blackgum, elm, pine, redcedar, and red maple. Common shrubs and vines found include French mulberry, hawthorns, blueberries, viburnums, greenbriers, blackberry, honeysuckle, and grape. Grasses and other herbaceous vegetation in the understory include bluestem, foxtail, nutsedge, poison ivy, greenbrier, Desmodium, and panicums.

Wildlife, fish and plant species and their habitats in the analysis area are managed in cooperation with the Arkansas Game and Fish Commission (AGFC), and the Arkansas Natural Heritage Commission (ARNHC). The state wildlife management agencies main responsibilities are to set policy for hunting and fishing regulations and law enforcement programs. The Natural Heritage Commission is responsible for collecting and maintaining information on rare plants, animals and natural communities in Arkansas. The Forest Service is responsible for managing fish and wildlife habitat conditions. The following discussion focuses on the habitat conditions that support wildlife populations and fisheries.

Several sources were used to determine the federally Endangered, Threatened, and Regional Forester's Sensitive (TES) species that are known to occur or have the potential to occur within the proposed project area. These include Forest Service GIS data layers, the NatureServe website (www.natureserve.org), and records from field surveys conducted by Forest Service personnel and surveys conducted under contract or cooperative agreement by other individuals, agencies, or universities. GIS data layers were created from District field survey records and data obtained from the Arkansas Natural Heritage Commission.

Specific survey information for each species will be listed under species that are addressed in this BE. All of the listed project files, surveys, reports, etc. are available for review at the Boston Mountain Ranger District office in Ozark, Arkansas.

- Biological field surveys of the project area by Whalen (District Biologist), May 2012.
- Fisheries surveys of Fanes, Cove and Mill Creeks by Rylee (District Biologist), Brown, Williams, Means, Hampton, Rue and Appleton (U.S. Forest Serive personnel), 2008.
- Bat mist netting surveys of the project area by Moore et. al, ASU, 2011.
- Biological field surveys of the project area by Culver (Biological SIS students), 2003 and Palmer (Forestry Tech), 2003.
- American burying beetle surveys completed in 2005, 2008 (no captures) and surveys in 1998 as well (no captures). Surveys done by Cain, Leimer, Lowry, Rylee, Odegard and Burgess.
- Deer spotlight surveys of the Main Division, Odegard, Rylee et al., 2002-2010.
- Incidental deer surveys of the Main Division, Whalen et. al, 2011-present.
- Final Report – Dr. Henry Robison on Crayfishes of the Boston Mountain and

Magazine Mountain Ranger Districts, Ozark National Forest, Arkansas (1998).

- Stream surveys/habitat assessment of Sprirts, Nix and Salt Fork Creeks, Jobi Brown (District NEPA Coordinator/Biologist), 2006.
- Final Report – Dr. Henry Robison on Distribution and Status of the Longnose Darter in the Ozark National Forest (1992).
- Walk-over surveys and monitoring records by William Puckette (U.S. Fish and Wildlife Service contractor-2000-present).
- A Comparative Study of the Flora, Fauna, and Water Quality of Springs in the Ozark National Forest by April Hargis, current District Biologist, Mississippi. National Forests, 1995.
- County occurrence records provided by the Arkansas Natural Heritage Commission.
- Plant distribution and occurrence records identified in Smith's An Atlas and Annotated List of the Vascular Plants of Arkansas (1988).
- Arkansas Mountain Lion Survey 1988-1991 (McBride).

Fisheries

Existing Conditions

For the purpose of this fisheries habitat analysis, the analyzed area will be the Spirits Creek watershed in Franklin County, Arkansas.

The RLRMP sets aside a completely separate management prescription area for Riparian Corridors. These corridors encompasses an area of 100-feet on each side of any perennial stream on the Forest. The plan also calls for Streamside Management Zones (SMZ) that range from 50 to 150 feet for all streams and springs depending on the slope of adjacent channel and if the stream is classified as perennial, defined channel, or as a spring.

Crayfish have also been studied in the watershed. Robison (1998), found that *Orconectes meeki, Orconectes palmeri longimanus,* and *Procambarus sp. nov* . are the most abundant crayfish species in streams and rivers on the Boston Mtn. Ranger District (Hurricane Creek and Lower Mulberry Watershed Analysis, USFS, 2004).

5. CONSULTATION HISTORY

Section 7 of the Endangered Species Act of 1973, as amended, outlines the procedures for interagency cooperation to conserve federally listed species and designated critical habitats. The OSNF has requested Section 7 formal consultation and has received Biological Opinions (BO) and concurrence letters from the USDI Fish & Wildlife Service (F&WS) relating to forest management activities planned in the OSNF Land and Resource Management Plan on the Indiana Bat, Gray bat and Ozark Big-eared bat (F&WS 1997-1998), the American Burying Beetle (F&WS 1994) and the Bald Eagle (F&WS 1998).

The F&WS (Conway office) is on the district mailing list for all projects requiring NEPA documentation. Through the years, informal consultation has been requested and received for numerous projects. Phone conversations with F&WS employees occur on an “as needed” basis.

Informal consultation and concurrence was received from the USFWS in Conway for the Browder Plus, Burr Ridge, Spud Rock, Stob Knob, Rosson Hollow, Jethro West and Dry Fork Projects (2009, 2008, 2000, 2004, 2005, 2005 and 2002). No further consultation with the USDI-FWS will be needed. In addition, as long as projects are within the standards and guidelines of the 2005 Ozark-St. Francis NF Revised Land and Resource Management Plan, further consultation with the USFWS is not needed.

6. SPECIES CONSIDERED AND EVALUATED

To begin this BE the most current copy of the OSNF TES list was reviewed. The OSNF TES list was developed by OSNF Supervisor’s Office (SO) personnel. SO personnel used the Regional Forester’s Sensitive Species List and the most current Endangered Species list to develop the OSNF List.

The need to conduct site-specific inventories of TES species for this project was assessed using direction in Forest Service Manual 2672.43. Based on this assessment, affected potential habitat in the proposed project area has either been inventoried for presence of these and other TES species (or were subject to general botanical survey), or the species are completely out of range or habitat type. The conclusion that additional surveys are not required for each species listed is based upon research or literature sources where available (see literature section at the end of this document). Some of these reasons include the following:

- The species is unlikely to occur because habitat is not present or the project area is outside the species' range.
- A current and adequate site-specific inventory for the species is already available.
- Survey methods are not feasible or effective.
- Even if the species is present, the project is expected to have "no effect" or "no impact" on the species (for example, because habitat within the project area where the species might occur will not be affected.)
- The project is expected to have "beneficial impacts" without impacts to individuals that need to be mitigated (for example, the species is mobile enough to avoid short-term direct disturbance and long-term habitat will be improved, or the species is abundant enough based on forest-wide population information to be able to take some short-term losses of individuals in exchange for improved habitat and expected long-term population increases).
- Although adverse effects to habitat or impacts to individuals may occur, knowing numbers and location of individuals would not improve application of mitigation or assessment of the project's effects to viability.

Federally Listed (Endangered or Threatened) Species

Eighteen federally listed species have been identified by the US Fish and Wildlife Service, Conway Office as occurring or having the potential to occur on the Ozark-St. Francis National Forests. These species are listed below in Table 2.

Table 2. Endangered and Threatened species identified by the US Fish and Wildlife Service as occurring or having the potential to occur on the Ozark-St. Francis National Forests. These species are considered in this BA/E.

Taxon	Scientific Name	Common Name	Status	Ozark NF Presence	Project Area Presence
Mammal	***Myotis grisescens***	**Gray Bat**	E	1	2
Mammal	***Myotis sodalis***	**Indiana Bat**	E	1	1
Mammal	***Corynorhinus townsendii ingens***	**Ozark Big-eared Bat**	E	1	1
Bird	*Sterna antillarum*	Interior Least Tern	E	3	3
Bird	*Campephilus principalus*	Ivory-billed Woodpecker	E	3	3
Reptile	*Alligator mississippiensis*	American Alligator	T	3	3
Fish	*Amblyopsis rosae*	Ozark Cavefish	T	2	3
Fish	*Scaphirhynchus albus*	Pallid Sturgeon	E	3	3
Beetle	***Nicrophorus americanus***	**American Burying Beetle**	E	1	2
Crayfish	*Cambarus aculabrum*	Cave Crayfish	E	3	3
Crayfish	*Cambarus zophonastes*	Hell Creek Cave Crayfish	E	2	3
Mussel	*Potamilus capax*	Fat Pocketbook	T	3	3
Mussel	*Lampsilis abrupta*	Pink Mucket	E	3	3
Mussel	*Leptodea leptodon*	Scaleshell Mussel	E	3	3
Snail	*Inflectarius magazinensis*	Magazine Mountain Shagreen	T	1	3
Plant	*Lesquerella filiformis*	Missouri Bladderpod	T	2	3
Plant	*Lindera mellissifolia*	Pondberry	E	3	3
Plant	*Geocarpon minimum*	Geocarpon	T	3	3

Status Codes

"E" = species is listed as "Endangered" by the USFWS

"T" = species is listed as "Threatened" by the USFWS

Ozark NF Presence Codes

1 = Species is known to occur on the Ozark National Forest.

2 = Species is not known to occur on Ozark National Forest managed lands, but has suitable habitat within the Forest and a known distribution which makes occurrence possible.

3 = Species does not occur on Ozark National Forest managed lands and is not likely to occur there due to habitat requirements or geographic distribution.

Project Area Presence Codes

1 = Species is known to occur within the project area.

2 = Species is not currently known from the project area, but may occur there due to the presence of suitable habitat and a known distribution that makes occurrence possible.

3 = Species is not currently known from the project area and is not likely to occur there due to habitat requirements or geographic distribution.

Fourteen federally listed species, from Table 2 above, were eliminated from consideration for this project on the Boston Mountain Ranger District of the Ozark National Forest because they do not occur on the Forest or their known distribution is well outside the counties that make up this project. These fourteen species include: interior least tern, ivory-billed woodpecker, American alligator, Hell Creek Cavefish, Ozark cavefish, pallid sturgeon, the cave crayfish *Cambarus aculabrum*, fat pocketbook, pink mucket, scaleshell mussel, Magazine Mountain shagreen, pondberry, Geocarpon and Missouri bladderpod . The proposed action will have "**no effect**" on these species or their habitat and they will not be considered further in this BA/E. No further consultation with the US Fish and Wildlife Service for these species is required.

The remaining four federally listed species will be given further consideration in this document due to their known occurrence on the Boston Mountain Ranger District or their potential for occurrence due to the presence of suitable habitat on the District and records nearby. These species are indicated in **bold print** in Table 2.

Sensitive Species

Thirty-two species occurring or having the potential to occur on the Ozark-St. Francis National Forests have been identified by the Regional Forester (Region 8) as Sensitive. These species are listed in Table 3 below.

Table 3. Regional Forester's Sensitive species which occur or have the potential to occur on the Ozark-St. Francis National Forests. These species are considered in this BA/E.

Taxon	Scientific Name	Common Name	Global Rank	Ozark NF Presence	Project Area Presence
Mammal	*Myotis leibii*	Eastern small-footed bat	G3	1	1
Bird	*Aimophila aestivalis*	Bachman's sparrow	G3	1	2
Bird	***Haliaeetus leucocephalus***	**Bald Eagle**	G5	1	1
Amphibian	*Eurycea tynerensis*	Oklahoma salamander	G3	1	3
Fish	*Notropis ozarcanus*	Ozark shiner	G3	1	3
Fish	***Percina nasuta***	**Longnose darter**	G3	1	2
Fish	*Typhlichthys subterraneus*	Southern cavefish	G3	2	3
Crustacean	*Orconectes williamsi*	William's crayfish	G2	1	3
Mollusk	*Lampsilis rafinesqueana*	Neosho mucket	G2	1	3
Insect	***Paduniella nearctica***	**Nearctic paduneillan caddisfly**	G1?	1	2

Isopod	***Lirceus bicuspidatus***	**An isopod**	G3Q	1	2
Plant	***Amorpha ouachitensis***	**Ouachita false indigo**	G3Q	1	3
Plant	*Callirhoe bushii*	Bush's poppymallow	G3	1	3
Plant	***Castanea pumila var. ozarkensis***	**Ozark chinquapin**	G5T3	1	1
Plant	***Cypripedium kentuckiense***	**Southern Lady's slipper**	G3	1	2
Plant	*Delphinium newtonianum*	Newton's larkspur	G3	1	3
Plant	*Delphinium treleasei*	Glade larkspur	G3	1	3
Plant	*Dodecatheon frenchii*	French's shooting star	G3	1	3
Plant	*Draba aprica*	Open-ground draba	G3	1	3
Plant	*Eriocaulon koernickianum*	Gulf pipewort	G2	1	3
Plant	*Fothergilla major*	Large witchalder	G3	2	3
Plant	*Juglans cinerea*	Butternut	G3G4	1	3
Plant	*Neviusia alabamensis*	Alabama snow-wreath	G2	1	3
Plant	*Quercus acerifolia*	Mapleleaf oak	G1	1	3
Plant	*Schisandra glabra*	Bay starvine	G3	1	3
Plant	***Silene ovata***	**Blue Ridge catchfly**	G2G3	1	2
Plant	*Silene regia*	Royal catchfly	G3	1	3
Plant	*Solidago ouachitensis*	Ouachita Mountain goldenrod	G3	2	3
Plant	***Tradescantia ozarkana***	**Ozark spiderwort**	G3	1	2
Plant	*Trillium pusillum var. ozarkanum*	Ozark least trillium	G3T3	1	3
Plant	*Valerianella nuttallii*	Nuttall's cornsalad	G1G2	2	3
Plant	*Valerianella ozarkana*	Ozark cornsalad	G3	1	3

<u>NatureServe Global Conservation Status Ranks</u>

G1 = Critically Imperiled- At very high risk of extinction due to extreme rarity (often 5 or fewer populations), very steep declines, or other factors.

G2 = Imperiled- At high risk of extinction due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors.

G3 = Vulnerable- At moderate risk of extinction due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors.

G4 = Apparently Secure- Uncommon but not rare; some cause for long-term concern due to declines or other factors.

G5 = Secure- Common; widespread and abundant.

G#G# = Range rank- A numeric range rank is used to indicate the range of uncertainty in the status of a species or community. A G2G3 rank would indicate that there is a roughly equal chance of G2 or G3 and other ranks are

much less likely. Ranges cannot skip more than one rank.

Rank Qualifiers

Q = Questionable Taxonomy- Taxonomic distinctiveness of this entity at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or the inclusion of this taxon in another taxon, with the resulting taxon having a lower-priority conservation priority.

? = Inexact Numeric Rank- Denotes some uncertainty about the numeric rank. (e.g. G3? – Believed most likely a G3, but some chance of either a G2 or G4).

T#- Intraspecific Taxon (trinomial)- The status of intraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the global rank. Rules for assigning T-ranks fallow the same principles for global conservation status ranks.

Project Area Presence Codes

1= species is known to occur within the project area

2= species is not currently known from the project area but may occur within the project area due to the presence of suitable habitat.

3= species is not currently known from the project area and is not likely to occur there due to habitat requirements or geographic distribution.

Twenty-two forest Sensitive species, taken from Table 3 above were eliminated from further consideration for this project on the Ozark National Forest. These eliminated species do not occur within the project area or do not have suitable habitat, based on consideration of the known and historic ranges of these species. These twenty-one species are: Oklahoma salamander, Ozark shiner, Southern cavefish, Williams crayfish, Neosha mucket, Butternut, Open ground draba, Glade larkspur, Newton's larkspur, Bush's poppymallow, French's shooting star, Large witchalder, Alabama snow-wreath, Mapleleaf oak, Bay starvine, Ouachita Mountain goldenrod, Ozark cornsalad, Ozark least trillium, Ouachita false indigo and Nuttall's cornsalad. Therefore the proposed project will have "**no impact**" on these species, and they will not be considered further in this BA/E.

The remaining ten Sensitive species will be given further consideration in this document due to their known occurrence on the Boston Mountain Ranger District or their potential for occurrence due to the presence of suitable habitat and/or nearby records in the project area. These species are indicated in **bold print** in Table 3.

7. EVALUATED SPECIES INFORMATION AND EFFECTS OF PROPOSED MANAGEMENT ACTIONS-ALTERNATIVES 1 & 2

Indiana Bat (*Myotis sodalis*)- Federally Endangered Species

The Indiana bat was listed as endangered under provisions of the Endangered Species Act (ESA) on March 11, 1967. A Recovery Plan was developed by the U.S. Fish and Wildlife Service, dated October 14, 1983. This range wide recovery plan outlines distributional and life history information along with management recommendations and recovery objectives. In October 1996, the Indiana Bat Recovery Team released a Technical Draft Indiana Bat Recovery Plan, with a final revised plan due later. There is no critical habitat (as defined in the ESA) for the Indiana bat on the Ozark-St. Francis National Forests, or in Arkansas.

The greatest threat to the Indiana Bat identified thus far has been direct disturbance of hibernating bat clusters in caves during the winter hibernating period from November through March. They are easily disturbed by human activity such as cave vandalism, spelunker traffic, cave commercialization, and continuous scientific research (especially over-collecting, too many trips to hibernacula, and banding in hibernacula). The total global population is estimated to be 352,000 individuals with 85% of these hibernating in seven caves and one mine in the midwest. The remaining 15% are found in smaller widely scattered locations. The entire population has been declining in recent years.

The Indiana bat is known to roost in the snags of 23 tree species (21 hardwood–2 pines) and rarely roosts in living trees. Twelve of these 23 have been designated as Class I trees; which means they are likely to develop loose exfoliating bark. Exfoliating (peeling) bark is a preferred roost location by Indiana bats. Class I trees include silver maple, bitternut hickory, eastern cottonwood, white oak, shagbark hickory, green ash, red oak, slippery elm, shellbark hickory, white ash, post oak and American elm (USDI-FWS, 1999c). Many of these species are found in stream valleys and lowlands and are infrequently encountered in upland pine and pine-hardwood timber stands where the dominant tree species is shortleaf pine. The potential habitat includes all Forest Service acres in Arkansas.

Known Arkansas populations consist of winter hibernacula with fewer than 6,000 individuals. One summer maternity colonies has been located in Arkansas in Clay County along the Black River. Most reported summer maternity roost sites have been north of the Ozark Mountains in Missouri and southern Iowa (Harvey, 1989).

Recent observation of hibernating bats partially covered with a white fungus currently called "white-nose fungus" appears to affecting hibernating bats in caves in New York, Vermont, Massachusetts and Connecticut. Bat species with confirmed cases include Eastern pipistrelle, little brown, northern long-eared, Eastern small-footed, and Indiana bats although it is possible that any cave-hibernating bat may be affected. At this time, little is known about the cause or origin of the fungus and whether it causes or accompanies the death of the bats. If it is transmittable and causes bat mortality, it has the potential to decimate large numbers of bats, perhaps entire colonies. Bat and cave researchers are implementing protective measures to reduce the possibility that contamination is spread from equipment or the clothing of cavers. Additional study is ongoing to determine the type of pathogen, its origin, and its virulence. To date, this fungus has not been identified in hibernating bat colonies in Arkansas but has been identified in the neighboring states of Missouri, Oklahoma and Tennessee.

Indiana Bat-Survey Information

The Indiana bat's life history and habitat requirements, for both the active portion of the year and during hibernation, are well known and succinctly summarized by Menzel et al. (2001). Mist net surveys on the Boston Mountain Ranger District have been extensive (Wilhide, Jackson 2000-2003; Ritsch 2004; Caviness 2001-2003, Medlin, 2005-2007, Brandebura et al., 2008, Moore et. al 2009-present). Regular surveys for the Indiana bat on the Boston Mountain and other Districts began in 1979 and have been conducted Forest-wide. Permanent monitoring caves have been established on the District and Forest wide. These sites have been established for over fifteen (15) years and are surveyed every two years to note the increase or decrease in this endangered species (Harvey et. al., 1979-present).

Summer roosting habitat is good for this species in the project area. This area does provide suitable summer foraging habitat for the Indiana bat and fair winter hibernating habitat. The analysis area was netted in June of 2011 by Patrick Moore et. al (Arkansas State University), with no Indiana bat captures.

Indiana Bat-Environmental Baseline

Indiana bats were first surveyed in the late 1950's. In the decades since then, additional colonies of hibernating Indiana bats were discovered and knowledge of the distribution and status of the species has expanded. This species was listed due to documented population losses and because it is extremely vulnerable to disturbance and destruction during the winter hibernation season when a high proportion of its population congregates in a small nuber of cave and mines. Despite protection of many of these hibernacula, the overall population has continued to decline. Population losses, however, are not universal throughout the range of the species. The population in the southern portion of the Indiana bat's range has suffered disproportionately and declined (80% decline in hibernating bats) while those in the northern Midwest and Northeast have maintained or increased in numbers during the same time period. The exact causes of continued decline of the Indiana bat are unknown because many of the hibernacula have been protected. Declines may be associated with bat activity during the active portion of the year.

The Boston Mountain Ranger District does have Indiana bats and winter hibernacula. The nearest known reproductive colony is in Clay county near the Black River in Arkansas.

Indiana Bat-Direct, Indirect and Cumulative Effects

Some trees will be removed during the relocation of the road. Indiana bats utilize snags for roosting habitat. A site visit by Rhea Whalen, District Biologist, in May of 2012, did not find any snags in the area where the relocation is proposed to occur. Bat mist netting surveys during 2011 did not capture Indiana bats in the analysis area. There are ample snags throughout area, but none directly in the path of the proposed road relocation. There are not any caves in the area proposed for road relocation.

Indiana Bat-Determination Of Effects

The activity proposed is consistent with the FLRMP. In the Biological Assessment dated July 28, 2005, the Forest Wildlife Biologist (with concurrence from the USFWS), has determined that the Indiana bat is "not likely to be adversely affected" from standard forest management, as long as the Revised Forest Plan guidelines and mitigations are followed. Implementation of forest-wide standards for the protection of caves, karst habitats, and riparian areas will help protect needed hibernacula sites as well as potential foraging sites for these species. This constitutes compliance with Section 7 of the Endangered Species Act (ESA) with respect to future activities carried out on the Ozark-St. Francis National Forests. **As described in the "Effects" section above, it is the determination of this BAE that the White Rock Mountain Road Relocation Project is "Not likely to adversely affect" *Myotis sodalis*, an endangered species.**

Gray Bat (*Myotis grisescens*)-Federally Endangered Species

Gray bats are cave residents throughout the year, although different caves are usually occupied in summer than winter. Few individuals are found outside caves. They hibernate primarily in deep vertical caves with large rooms that act as cold air traps (Harvey, 1989).

In summer months, female gray bats form maternity colonies of a few hundred to many thousands of individuals, often in large caves containing streams. Maternity colonies prefer caves that, because of their configuration, trap warm air or that provide restricted rooms or domed ceilings that are capable of trapping the combined body heat from clustered individuals.

Summer caves are rarely located more than 2 km, and usually less that 1 km from rivers or reservoirs. Each summer colony occupies a traditional home range that often contains several roosting caves scattered along as much as 70 km of river or lake shore. Gray bats forage primarily over water along rivers or near lake shores. Most foraging occurs within 5 km of the surface. The greatest threat to the species is vandalism by people during the winter while bats are in caves, or in the summer, when maternity cave sites could be distrubed.

Winter hibernacula are scattered over the north portion of the state, but the largest known hibernacula is on the Sylamore Ranger District, where several hundred thousand bats gather in caves to spend the winter. Summer roost sites are more scattered and can vary from one year to the next. This bat can occur on any Ozark National Forest district with the possible exception of the Magazine Ranger District, which is south of the Arkansas River.

Gray Bat-Survey Information

Mist net surveys on the Boston Mountain Ranger District have been extensive (Wilhide, Jackson 2000-2003; Risch 2004; Caviness 2001-2003, Medlin 2005-2007, Brandebura et al, 2008, Moore et. al 2009-present). Regular surveys for the gray bat on the Boston Mountain Ranger District began in 1984 and have been conducted Forest-wide. Permanent monitoring caves have been established on the District and Forest wide. These sites are checked every two years to note the increase or decrease in this endangered species (Harvey, Sasse, Redman, 1999-2004). The project area was netted in June of 2011 by Patrick Moore et. al (Arkansas State University), with no gray bat captures.

There is potential winter habitat approximately ½ mile from the project area. Foraging habitat is fair within the project area for this bat. There are no known gray bat hibernacula caves in the project area and no caves in the vicinity of the proposed road relocation project.

Recent observation of hibernating bats partially covered with a white fungus currently called “white-nose fungus” appears to affecting hibernating bats in caves in New York, Vermont, Massachusetts and Connecticut. Bat species with confirmed cases include Eastern pipistrelle, little brown, northern long-eared, Eastern small-footed, and Indiana bats although it is possible that any cave-hibernating bat may be affected. At this time, little is known about the cause or origin of the fungus and whether it causes or accompanies the death of the bats. If it is transmittable and causes bat mortality, it has the potential to decimate large numbers of bats, perhaps entire colonies. Bat and cave researchers are implementing protective measures to reduce the possibility that contamination is spread from equipment or the clothing of cavers. Additional study is ongoing to determine the type of pathogen, its origin, and its virulence. To date, this fungus has not been identified in hibernating bat colonies in Arkansas but has been

identified in the neighboring states of Missouri, Oklahoma and Tennessee.

Gray Bat-Environmental Baseline

Dr. Mick Harvey has conducted studies on the distribution, status, and ecology of endangered Arkansas bats since 1978. The study was designed primarily to monitor populations of endangered bats at major Arkansas hibernacula and summer caves and to locate additional endangered bat colonies (Harvey & Redman, 2003).

The gray bat population was estimated to be about 2.25 million in 197O; however, in 1976 a census of 22 important colonies in Alabama and Tennessee revealed an average decline of more than 5O% (USFWS, 2003). Due to protective increases taken at high priority colony sites in the late 197O's and throughout the 198O's, the declines have been arrested at some major sites and those populations are now stable or in some cases are increasing.

The total population of the gray bat at this time is estimated to number over 2,500,000; however, about 95% hibernate in only 17 caves-5 in Tennessee, 4 in Missouri, 5 in Arkansas, 2 in Kentucky and 1 in Alabama. Although gray bat numbers are still relatively high, their total population decreased significantly prior to protection resulting from being listed as federally endangered in 1976.

There are no known threats to the gray bat with implementation of the proposed action.

Gray Bat-Direct, Indirect and Cumulative Effects

This bat has been documented foraging in the watershed, however, there are no records of hibernacula or maternity sites found within the analysis area for the gray bat. No activities are planned that would impact either blufflines or caves favored by this species.

Forest-wide standards will provide for the protection of all existing or discovered gray bat caves. Hibernacula and summer roost sites are protected by the implementation of forest-wide standards, which maintain vegetation buffers of 200 feet around all caves.

All activities proposed are consistent with the RLRMP. In the Biological Assessment dated July 28, 2005, the Forest Wildlife Biologist (with concurrence from the USFWS), has determined that the gray bat is “not likely to be adversely affected” from standard forest management, as long as the Revised Forest Plan guidelines and mitigations are followed. Implementation of forest-wide standards for the protection of caves, karst habitats, and riparian areas will help protect needed hibernacula sites as well as potential foraging sites for these species. This constitutes compliance with Section 7 of the Endangered Species Act (ESA) with respect to future activities carried out on the Ozark-St. Francis National Forests.

Gray Bat-Determination Of Effects

As described in the “Effects” section above, it is the determination of this BAE that the White Rock Road Relocation Project is “Not likely to adversely affect” *Myotis grisescens*, an endangered species.

Ozark Big-eared Bat (*Corynorhinus townsendii ingens)*-Federally Endangered Species

The Ozark big-eared bat is is generally associated with caves, cliffs, and rock ledges in well drained, oak-hickory forest. Maternity caves and hibernacula occur in a number of different surroundings, from large continuous blocks of forest, to smaller forest tracts interspersed with open areas. Clark (1993) found that adult female Ozark big-eared bats from maternity colonies preferred to forage along woodland edges. By foraging along woodland edges the bat may benefit from a less cluttered environment, but cover is nearby and prey densities are high.

Like many other bats, they return year after year to the same roost sites and generally do not migrate for long distances (Harvey et. al., 2003).

The Ozark big-eared bat was listed as endangered because of the small population size, reduced distribution, and vulnerability to human disturbance. Habitat loss and increased human disturbance at maternity caves and hibernacula are likely causes of the species decline. Predation, reduced food supply, and disease may have some effect, but human disturbance at maternity and hibernation sites remains the major concern.

Ozark Big-eared Bat-Survey Information

Mist net surveys on the Boston Mountain Ranger District have been extensive (Wilhide, Jackson 2000-2003; Ritsch 2004; Caviness 2001-2003, Medlin 2005-2007, Brandebura et al, 2008, Moore et. al, 2009-present). Regular surveys for the Ozark big-eared bat on the Boston Mountain Ranger District began in 1984 and have been conducted Forest-wide. Permanent monitoring caves have been established on the District and Forest wide. These sites are checked every three years to note the increase or decrease in this endangered species (Harvey, Sasse, Redman, 1999-2004). Bat netting surveys were conducted in the project area in June of 20011 by Patrick Moore et. al (Arkansas State University), with no Ozark Big-eared bat captures.

There are potential Ozark big-eared bat caves near the project area (but not near the proposed road relocation area) and foraging habitat is fair in the project area.

Ozark Big-eared Bat-Environmental Baseline

The range of this bat includes only a few caves in northwestern and north-central Arkansas, south-western Missouri, and eastern Oklahoma. Because Ozark big-eared bats are so rare, little is known about their biology. The total population of this species is probably less that 2000 (Harvey, 2003). In Arkansas, only six caves are presently known to be regularly inhabited by colonies of Ozark big-eared bats: 1 hibernation cave, 2 nearby maternity caves in north-central Arkansas, 1 hibernation cave, 2 maternity caves in northwestern Arkansas. The total population in Arkansas is around 550 individuals, with approximately 1,400 individuals in Oklahoma, and they are no longer known to exist in Missouri (Harvey, 2003).

Recent observation of hibernating bats partially covered with a white fungus currently called “white-nose fungus” appears to affecting hibernating bats in caves in New York, Vermont, Massachusetts and Connecticut. Bat species with confirmed cases include Eastern pipistrelle, little brown, northern long-eared, Eastern small-footed, and Indiana bats although it is possible that any cave-hibernating bat may be affected. At this time, little is known about the cause or origin of the fungus and whether it causes or accompanies the death of the bats. If it is

transmittable and causes bat mortality, it has the potential to decimate large numbers of bats, perhaps entire colonies. Bat and cave researchers are implementing protective measures to reduce the possibility that contamination is spread from equipment or the clothing of cavers. Additional study is ongoing to determine the type of pathogen, its origin, and its virulence. To date, this fungus has not been identified in hibernating bat colonies in Arkansas but has been found in the neighboring states of Oklahoma, Tennessee and Missouri.

Ozark Big-eared Bat-Direct, Indirect and Cumulative Effects

This species has been near the project area which provides some suitable summer foraging habitat for this bat and wintering/roosting habitat. No activities are planned that would impact either blufflines or caves favored by this species.

All activities proposed with this both alternatives are consistent with the FLRMP. In the Biological Assessment dated July 28, 2005, the Forest Wildlife Biologist (with concurrence from the USFWS), determined that the Ozark big-eared bat is "not likely to be adversely affected" from standard forest management, as long as the Revised Forest Plan guidelines and mitigations are followed. Implementation of forest-wide standards for the protection of caves, karst habitats, and riparian areas will help protect needed hibernacula sites as well as potential foraging sites for these species. This constitutes compliance with Section 7 of the Endangered Species Act (ESA) with respect to future activities carried out on the Ozark-St. Francis National Forests.

Ozark Big-eared Bat-Determination Of Effects

As described in the "Effects" section above, it is the determination of this BAE that the White Rock Road Relocation Project is "Not likely to adversely affect" *Corynorhinus townsendii ingens,* an endangered species.

American Burying Beetle (*Nicrophorus americanus)*-Federally Endangered Species

This species of carrion beetle was formerly distributed throughout temperate eastern North America. It is now known from several locations in Oklahoma and Arkansas as well as Nebraska, Southwest Missouri and on Block Island, off the coast of Rhode Island. Based on the drastic decline and extirpation of the species over nearly its entire range, *Nicrophorus americanus* was listed as endangered by the U.S. Fish and Wildlife Service in 1989.

This species has been found in several different habitat types, including grassland, lightly grazed pasture, oak-hickory forests with open understory and edge sites. Soil types that are conducive to excavation are important. Carrion size is important but not a critical factor. Preferred carrion size ranges from 100 to 200 grams (Frazier 1992). The major threats to this beetle include habitat fragmentation, insecticide and bug-zapper use, disturbance of soils, and competition from vertebrate scavengers.

American Burying Beetle-Survey Information

Eight years of district-wide sampling for American Burying Beetle (ABB) on the Boston Mountain Ranger District has failed to document a single occurrence here. Surveys were conducted for this species in the proposed project area in 2005 and 2008 by Whalen et al. Results of the surveys caught numerous other burying beetles, but no American burying beetles

were found. Suitable habitat for this species is found in the analysis area. The natural history of this interesting beetle is well documented in its recovery plan and other published documents (USDI-FWS 1991a; Creighton et al. 1993; Lomolino et al. 1995; Nebraska Game and Parks Commission 1995). Additional surveys are not needed to provide more definitive information to improve the determination of effects to this endangered species with regard to the proposed action.

American Burying Beetle-Environmental Baseline

The environmental baseline is an analysis of the effects of past and ongoing human and natural factors leading to the current status of species, their habitats and ecosystem within the action area (USDI-FWS 1998). The ABB appears to be a habitat generalist with a slight preference for grasslands (grasses and forbs) and open understory. Considering the broad geographic range formerly occupied by the beetle, it is unlikely that vegetation or soil type were historically limiting. Carrion availability, and not habitat, may be the greatest factor determining where the species can survive. The preference of this insect for areas of grasses and forbs (as would be found in early forest stage cover habitat, open pine or hardwood woodlands) is not unexpected since many of the largest assemblages of appropriately sized small mammals and birds occur in these areas and their carcasses afford the beetle egg laying/brooding habitat (Hedrick 1993; Nebraska Game and Parks Commission 1995; USDI-FWS 1995).

Quite possibly the greatest limiting factor and threat to the viability of the ABB in general may be a lack of natural stochastic events or management actions that set back or maintain conditions with abundant grasses, forbs and shrubs that appeal to small mammals and birds. In many areas, prairie, open forests and other open conditions that would have supported appropriately sized prey have been converted to other resource uses that include development for housing, conversion to farming, and road development. There are no known threats to this species from the proposed project other than what has been described in the following text (USDI-FWS 1994).

American burying beetle – Direct, Indirect and Cumulative Effects

Road relocation could harm individuals but will have no direct or indirect effects as this beetle has not been documented from the project area.

Generally, the indirect effects of forest management activities will be beneficial to American burying beetle (ABB) habitat in either alternative. Increased establishment and maintenance of early seral habitat will provide enhanced habitat for the ABB food base of small vertebrate carrion. Indirect beneficial effects on ABB habitat would primarily involve maintenance and/or enhancement of grass/forb/shrub conditions that harbors small mammal and other potential carrion populations. The cumulative effects of forest management activities in the proposed alternative on ABB habitat would be continued enhancement of the grass/forb habitat, providing conditions beneficial to this species, but ground-disturbing activities in proximity to individuals may directly harm them (USFS- BA, 2005).

American Burying Beetle-Determination of Effects

As described in the "Effects" section above, it is the determination of this BAE that the White Rock Road Relocation Project on the Ozark NF will have "No effect" on the

American burying beetle *Nicrophorus americanus*, an endangered species.

Bald Eagle (*Haliaeetus leucocephalus*)-Sensitive Species

The potential breeding habitat for the bald eagle would be about 2,000 acres and includes forested edges of permanent open water areas of lakes, rivers and perennial streams along with cypress/tupelo swamps in the Mississippi floodplain of the St. Francis National Forest. Potential wintering habitat is about 60,000 acres and is derived from buffering stream corridors, permanent open water areas, known communal roosts, and cypress/tupelo swamps.

The most important recognizable threat to the bald eagle in Arkansas at this time is being shot by poachers. There is also concern of avian diseases with recent die-offs occurring on Lakes Ouachita and Degray in Arkansas.

This species has been noted in past surveys on the district and is seen during winter months near the Illinois River, the Mulberry River, Lee Creek, Lake Shepherd Springs, Lake Fort Smith, Frog Bayou and around Shores Lake.

Suitable habitat usually includes a number of very large trees with open branches suitable for roosting, where the potential for human disturbance is minimal. There have been reported sightings of this species flying over the area during winter months near the Mulberry River.

Bald Eagle-Survey Information

Annual eagle surveys are conducted by the Arkansas Game and Fish Commission in cooperation with the U. S. Fish and Wildlife Service, U. S. Army Corps of Engineers, National Wildlife Federation and the USDA-Forest Service. These surveys showed that wintering populations within the state have steadily increased to over 1,000 birds in 1999 (USDI-FWS, 1999). Additional surveys are not needed to provide more definitive information to improve the determination of effects to this sensitive species with regard to the proposed action.

Bald Eagle-Environmental Baseline

This species, recently de-listed (2007) as a threatened species, but still on the Regional Forester's sensitive species list, has been noted in the project area and is a common winter visitor to the analysis area, particularly along Fanes and Cove Creeks. In 1994, the bald eagle was upgraded from endangered to threatened the lower 48 states. Bald eagle numbers in the lower 48 states climbed from 417 nesting pairs in 1963 to more than 4,400 pairs in 1994. In addition, 5,000 to 6,000 juvenile bald eagles live in the lower 48. Federal protection and tremendous public support led to this recovery. In June of 2007, the USDI Fish and Wildlife Service announced the draft post-delisting monitoring plan available and is soliciting public comment for 90 days for the bald eagle and recently the bald eagle was de-listed and has been placed on the Regional Forester's sensitive species list.

The first successful bald eagle nesting since 1930 was reported in Arkansas in 1982. In 1995, 18 pairs of Arkansas eagles successfully fledged young from the nest. Arkansas ranks in the top 10 states in the number of winter bald eagle sightings. Over 1,000 bald eagles are counted each winter, nearly triple the 368 recorded in 1979. There are no known threats to this highly mobile species with implementation of the proposed action. Additional surveys are not needed to further delineate the distribution of this species within the project area and on the forest.

Bald Eagle-Direct, Indirect and Cumulative Effects

Any birds in the area during road relocation activities would likely move away temporarily to avoid the noise and traffic. The road relocation treatments proposed will not affect any known roost sites.

There would be no direct or indirect impact on this species with the proposed treatment. When the effects of the proposed action within the project area are combined with potential effects of all other planned or anticipated projects on both public and private lands, which would include the White Rock Road Relocation Project, there would be no cumulative impacts. The proposed action will not impact individuals, cause a decline in populations, affect the federal listing, or cause loss of viability to this avian species.

Bald Eagle-Determination Of Effects

As described in the "Effects" section above, it is the determination of this BAE that the White Rock Road Relocation Project on the Ozark NF is "No direct, indirect or cumulative impacts on the bald eagle" *Haliaeetus leucocephalus*, a sensitive species.

Ozark Chinquapin (*Castanea pumila ozarkensis*)-Sensitive Species

The Ozark chinquapin is almost totally restricted to the Interior Highlands of Missouri, Arkansas, and Oklahoma with disjunct populations in Louisiana, Mississippi, and Alabama. Until the introduction into this country of the chestnut blight (*Endothia parasitica*) and its subsequent spread, the Ozark chinquapin had been considered a locally abundant and widespread tree species in the Interior Highland region. As a result of the spread of this parasite, few mature trees of this species still exist, although sprouting from stumps is quite common (Tucker, 1980).

Monitoring on the OSNF Forest indicates that this species is still widely distributed, but few trees may be found that do not show evidence of the blight. This tree is found on all Ozark NF districts, except the St. Francis.

Ozark Chinquapin –Survey Information:

This species was not found in the proposed project area. The Ozark chinquapin is fairly common on the Boston Mountain Ranger District. Most trees on the District are small trees resulting from stump sprouts, with very few surviving to the age of producing seed. It has been documented from 38 counties in Arkansas (ANPS, 1998). Additional surveys are not needed to further delineate the distribution of this species within the project area and on the forest.

Ozark Chinquapin-Environmental Baseline

This species was listed as sensitive because it is threatened with destruction by a fungal disease.

Ozark Chinquapin-Direct, Indirect and Cumulative Effects

The Ozark chinquapin was not found in the project area. plants.

Road relocation could harm individuals by uprooting, however, this species favors some disturbance and it was not found in the proposed road relocation site.

The impact to sprout clumps incidental to normal management practices would be one of release. Since sprouts persist and are released in normal forest management operations, there would be no direct impacts to Ozark Chinquapin. The indirect impact of normal forest management operations is to perpetuate chinquapin sprout clumps in a vigorous vegetative state. These treatments are not expected to produce cumulative impacts to this species. New road construction or road relocation could open up the canopy, thus allowing sunlight to reach the forest floor. Personal observation of the Ozark Chinquapin indicates that it grows best in areas where there is abundant sunlight (Rylee, 2004). The proposed action will have no impact as it was not found in the area proposed for road relocation. When the effects the proposed project are combined with potential effects of all other planned or anticipated projects on both public and private lands, there would be no known cumulative impacts on this species.

Ozark Chinquapin-Determination of Effects

It is the determination of this BAE that the proposed action in the White Rock Road Relocation Project will have no impacts to this tree species.

Ozark Spiderwort (*Tradescantia ozarkana*)-Sensitive Species

This plant is endemic to the Ozark Mountains of Missouri, Oklahoma, and Arkansas and the Ouachita Mountains of western Arkansas and southeastern Oklahoma. There are fifteen extant populations in Missouri, more than that in Arkansas, and a few in Oklahoma. The species is considered relatively secure despite some documented declines due to construction of dams/impoundments. There are no known immediate rangewide threats such as habitat conversion. Numerous local potential threats are reported however, including housing developments, roadway construction and maintenance, and herbicide use (MO NHD 1994, Watson 1989).

Ozark Spiderwort-Survey Information:

This plant is fairly common on the Boston Mountain Ranger District and is often found along roads. Field surveys in May of 2012 failed to note the presence of this plant in the project area, however, habitat is fair for this species in the project area. Additional surveys are not needed to improve the determination of effects to this sensitive species, but are needed to further delineate the distribution of this species on the forest.

Ozark Spiderwort-Environmental Baseline

Trends for this species are not well-documented, but *Tradescantia ozarkana* may have suffered a substantial loss due to a series of impoundments on the White River in Missouri. These reservoirs flooded several populations, and Steyermark (1963) estimated that the erection of these dams has "destroyed millions of plants." In Oklahoma, Watson (1989) reported that *T. ozarkana* has not declined in the Ozark Mountains within the last 50 years but has declined by 71 percent in the Ouachita Mountains, although this percentage is based on a low sample size (two out of seven populations confirmed). A number of historical populations have not been relocated throughout the range of *T. ozarkana* suggesting possible extirpation by natural or other causes. While this supports a downward trend, at those sites where *T. ozarkana* is known to occur population numbers are often in the hundreds and occasionally in the thousands of individuals, suggesting a taxon capable of sustaining itself when under natural conditions (NatureServe, 2011).

Ozark Spiderwort-Direct, Indirect and Cumulative Effects

Road relocation could be detrimental to individual species, through the uprooting of the plants. This is unlikely, however, since this plant was not found in the path of the proposed road relocation.

Implementation of the proposed alternative may impact individuals but is not likely to cause cumulative impacts, such as a declining trend to the Ozark spiderwort's federal listing or loss of viability.

Ozark Spiderwort-Determination of Effects

It is the determination of this BAE that the proposed action in the White Rock Road Relocation Project may impact individuals but is not likely to cause cumulative impacts, such as a declining trend to the Ozark spiderwort's federal listing or loss of viability.

Longnose Darter-Survey Information

This fish is found in the Mulberry River watershed. Stream surveys were conducted in Spirits, Cove, Fanes and Mill Creeks in 2008 by U.S. Forest Service personnel (USFS, 2008). These surveys failed to note the presence of this species in the project area streams. Additional surveys are not needed to improve the determination of effects to this sensitive species or to further delineate the distribution of this species on the forest.

Longnose Darter-Environmental Baseline

Reduction in distribution is generally attributed to pesticides associated with hog and chicken litter, a reduction in habitat and fish competition. The habitat reduction and fish competition are chiefly caused by recent developments of reservoirs (Robison and Buchanan 1988) with siltation possibly affecting it to some degree. The Longnose darter appears to be very sensitive to environmental disturbances (Robison and Buchanan 1988). This species has potential habitat in the Mulberry River drainage; habitat within the analysis area is poor for this fish in Spirits Creek.

Longnose Darter-Direct, Indirect and Cumulative Effects

Best management practices (BMPs) of clearly marking on the ground all stream management zones along all streams will be adhered to in order to protect the water quality of streams within the project area. Additional standards to protect water quality in streams, springs, seeps, and other karst features can be found in the RLRMP.

Following SMZ standards in the RLRMP on width and basal area would protect habitat for salamanders, snakes, and other riparian dependent species. Project level compliance with these mitigation/protective measures and adherence to BMP's will eliminate negative effects to wetlands, riparian areas and streamside protection zones and any potential negative impacts to habitat for this species.

The proposed road relocation and subsequent erosion work on the existing road will improve overall erosion conditions and will reduce sedimentation into Spirits Creek, which flows into the Mulberry River, where this fish is located. Road relocation may cause some sedimentation, however, this will be short in duration and will improve the erosional conditions of the road.

Implementation of the proposed alternative will have beneficial indirect impacts to this fish species through road relocation and erosion work.

Longnose Darter-Determination of Effects

It is the determination of this BAE that the proposed action in the White Rock Road Relocation Project should have beneficial indirect impacts to the habitat for the Longnose darter.

Nearctic Paduneillan Caddisfly-(*Paduniella nearctic)*-Sensitive Species

This species is endemic to Arkansas and Missouri and is found in creeks to medium rivers. It was previously thought in Arkansas to only occur in Devils Den State Park, but the distribution was later expanded to cover the 4th level watersheds of Robert S. Kerr Reservoir, Frog-Mulberry, Dardanelle Reservoir, and Little Red. This species lives in running water where it makes a tube-like retreat of sand, organic matter, and silk that it attaches to rocks and logs. It feeds on periphyton and fine particulate matter around its retreat (Merritt and Cummings 1996).

Nearctic Paduneillan Caddisfly-Environmental Baseline

This caddisly has recently been identified from the Buffalo River National Park in the Buffalo River 4th level watershed (Mott and Laurans 2004) and on the Forests at the Barkshed Recreation Area on the Sylamore Ranger District in North Sylamore Creek (4th level watershed) (Moulton and Stewart 1996). This species seems to have a low tolerance for sedimentation. This species is in the family Psychomyiidae, which is known to be intolerant of disturbance. On a scale of 1 to 10 (1= intolerant, 10= tolerant), this family is rated at three.

Nearctic Paduneillan Caddisfly-Survey Information

The distribution of this species has not been extensively studied. Invertebrate samples were taken from Sprits Creek in 2012. To date, this caddisfly has not been identified in the project area and no historic records are known to occur; however, this caddisfly has potential habitat in the analysis area and the distribution of this caddisfly is unknown. Additional surveys are not needed to improve the determination of effects to this sensitive species, but are needed to further delineate the distribution of this species on the forest and on the Boston Mountain Ranger District.

Nearctic Paduneillan Caddisfly-Direct, Indirect and Cumulative Effects

The RLRMP sets aside a completely separate management prescription area for Riparian Corridors. These corridors encompasses an area of 100-feet on each side of any perennial stream on the Forest. The plan also calls for Streamside Management Zones (SMZ) that range from 50 to 150 feet for all streams and springs depending on the slope of adjacent channel and if the

stream is classified as perennial, defined channel, or as a spring.

The use of forest standards and state BMPs in management activities will lower the potential for any effect of sedimentation on this species of caddisfly. The use of streamside management zones and the addition of a Riparian Corridor Management Area (3.I) will help to stabilize the aquatic community and actually may increase the available habitat for this species. Because caddisflies are terrestrial as adults and are able to fly, the Neoartic paduneillan caddisfly should be able to colonize new available habitat fairly quickly.

Implementation of the proposed alternative should have no direct, indirect or cummulative impacts to this caddisfly. Habitat should be improved with the relocation of White Rock Mountain Road and the subsequent erosion control work.

Nearctic Paduneillan Caddisfly-Determination of Effects

It is the determination of this BAE that the proposed action in the White Rock Road Relocation Project should have beneficial indirect impacts to the habitat for this aquatic species.

Isopod-(*Lirceus bicuspidatus*)-Sensitive Species

The Isopod is endemic to Arkansas. The actual distribution of this species is not well known or understood. It is found in streams and possibly in caves that have moving water. This species has been found on both the Ozark and St. Francis National Forests.

Isopod-Survey Information

Invertebrate samples were taken Spirits Creek in 2012. To date, this isopod has not been identified in the project area and no historic records are known to occur; however, this species has potential habitat in the analysis area and the distribution of this isopod is uncertain. Additional surveys are not needed to improve the determination of effects to this sensitive species, but are needed to further delineate the distribution of this species on the forest and on the Boston Mountain Ranger District.

Isopod-Environmental Baseline

The main impacts to this species seem to be activities that interfere with habitat and water quality. This could occur from the use of chemicals, dam construction, stream alterations, or sediment increases. Populations on or near the Ozark-St. Francis National Forests would be most susceptible to management activities like herbicide used, pesticide use, and fire retardants but these treatment actions are typically not widespread and impacts are limited to the sites where they occur. It could also be susceptible to sediment increases from activities like logging, road construction, cattle grazing, burning, and over abundant recreational use.

Isopod-Direct, Indirect and Cumulative Effects

The RLRMP sets aside a completely separate management prescription area for Riparian Corridors. These corridors encompasses an area of 100-feet on each side of any perennial stream on the Forest. The plan also calls for Streamside Management Zones (SMZ) that range from 50 to 150 feet for all streams and springs depending on the slope of adjacent channel and if the stream is classified as perennial, defined channel, or as a spring.

The proposed action complies with Forest Plan standards and objectives, which will give protection to stream, spring and cave habitats that might be utilized by this species. These standards and objectives will prevent degradation of habitat and impacts to this aquatic species. There will be no direct, indirect or cumulative impacts to this isopod with implementation of the proposed action. Habitat should be improved with the relocation of White Rock Mountain Road and the subsequent erosion work.

Isopod-Determination of Effects

It is the determination of this BAE that the proposed action in the White Rock Road Relocation Project should have beneficial indirect impacts to the habitat for this aquatic species.

Southern Lady-Slipper (*Cypripedium kentuckiense*)-Sensitive Species

This plant is known to occur in 12 Arkansas counties and possibly others (Smith, 1988). The preferred habitat for this plant consists of moist floodplains along creeks and on rich moist slopes. The biggest threat to the plant is collection for commercial sale and digging for replanting in wildflower gardens. The plant appears to be able to tolerate certain timber management activities with some treatments, such as thinning being beneficial.

Southern Lady-Slipper-Survey Information:

This plant was not found during field surveys in May of 2012. Habitat is fair near Spirits Creek in the project area, but not in the area proposed for road relocation. The Boston Mountain Ranger District has pinpoint locations for these plants and some of the sites are checked every 3-5 years to ensure that the sites still remain stable to increasing. Additional surveys are not needed to improve the determination of effects to this sensitive species, but are needed to further delineate the distribution of this species on the forest. These plants generally occur where little to no management will occur.

Southern Lady-Slipper-Environmental Baseline

The status of this plant is reported as improving in Oklahoma (Oklahoma Natural Heritage Inventory 2001) and reportedly "thriving" in Arkansas (Ouachita National Forest 2001). It is generally in decline in population size and extent throughout its range within Kentucky; no Kentucky populations have been increasing (Deborah White, pers. comm., 2002). One of the five known Alabama populations (all of them small) recently fell victim to poachers (Al Schotz, pers. comm., 2002). The Georgia site appears to be a young population slowly expanding, with several juveniles scattered some distance from a half dozen clustered flowering plants (Tom Patrick, pers. comm., 2002). Threats include collection and road/highway construction, both the actual construction taking place on a site where the plants occur and the resultant changes in hydrology over a wider area (Tennessee Natural Heritage Program 2001, Deborah White, pers. comm. 2002) (NatureServe, 2004).

Southern Lady-Slipper-Direct, Indirect and Cumulative Effects

This plant is found primarily in riparian corridors. There are no known sites in the project area

along Spirits creek or where the road is proposed to be relocated.

Road work as proposed will not impact this species as it was not found in areas where road construction/maintenance will occur. Implementation of the proposed alternative will have no cumulative impacts to the southern lady-slipper.

Southern Lady-Slipper-Determination of Effects

It is my determination that the proposed action in the White Rock Road Relocation Project will have no impacts to the Southern Lady-Slipper as it was not found in the areas proposed for work.

Ouachita False Indigo/Leadplant-Survey Information

Occurrence on the Forests is limited to streamside zones and a few roadside ditches where ground disturbance has occurred. Surveys of the project area in 2012 noted several leadplant species along the roadside and where the road is proposed to be relocated. Because the leadplants found had completed the blooming period, it was difficult to identify the leadplant species to determine if they were the common leadplant species or Ouachita leadplant. Therefore, for analysis purposes, it is assumed that the plants found were Ouachita leadplant. Additional surveys are not needed to improve the determination of effects to this sensitive species, but are needed to further delineate the distribution of this species on the forest.

Ouachita False Indigo/Leadplant-Environmental Baseline

This plant is known from several locations on Mt. Magazine (Tucker, 1989). This endemic is found elsewhere in Arkansas and Oklahoma. It has been noted in Conway, Franklin, Johnson, Logan, Madison, and Van Buren Counties as well as in southern Arkansas in Clark, Garland, Montgomery, Perry, Polk, Saline, Scott, and Yell Counties.

This species is be affected by increased foot traffic, herbicide use along trails/ roadside areas, or by construction activities that include the scraping or clearing of land by bulldozer. Occurrence on the Forests is limited to streamside zones and a few roadside ditches where ground disturbance has occurred.

The primary threat to the Ouachita leadplant throughout its range is habitat destruction by land clearing, trampling by foot traffic, and herbicide use along roadsides where it occurs.

Ouachita False Indigo/Leadplant-Direct, Indirect and Cumulative Effects

Road work as proposed could impact this species as it possible exists along the roadside and directly in the path of the proposed road relocation. This project could harm a few individual plants through uprooting.

Implementation of proposed alternative may impact individuals through direct uprooting but is not likely to cause a trend to federal listing or a loss of viability of this plant species.

Ouachita False Indigo/Leadplant-Determination of Effects

As described in the Effects section above, it is the determination of this BAE that the White

Rock Road Relocation Project as proposed may impact individuals through direct uprooting but is not likely to cause a trend to the federal listing or a loss of viability of this plant species.

Blue Ridge Catchfly (*Silene ovata*)-Sensitive Species

This midwestern endemic of tall grass prairie habitats with relatively few, scattered populations are most abundant in Missouri; extirpated from Kansas and Tennessee, and considered quite rare in all other states in it's range. Many remaining population remnants are along roadsides where vulnerable to construction or to changes in management of roadside vegetation. This plant was not found in the analysis area, however, habitat is good for this plant along Spirits Creek.

Blue Ridge Catchfly-Survey Information

Surveys were conducted of the project area by District Biologist Rhea Rylee in May 2012. This plant was not found in the project area, however, habitat is good for this plant. There is one known site for this plant just outside of the analysis area. Additional surveys are not needed to improve the determination of effects to this sensitive species but are needed to delineate the distribution of this species on the forest.

Blue Ridge Catchfly-Environmental Baseline

The range for this species is from Virginia south and west to Georgia, Alabama, Mississippi, and northern Arkansas. The plant is primarily restricted to the Appalachian physiographic region. In Arkansas, this species is found in Baxter, Benton, Cleburne, Franklin, Newton, Pope, Stone, and Van Buren Counties. Favorable habitat would include talus slopes beneath a sandstone bluff lines. This type of habitat is limited on the Forests.

Primary threats to this species include forest management practices, and to a lesser extent, land-use conversion and habitat. Other threats include grazing by deer and feral hogs, flooding by impoundment, road construction, and quarrying. Plants near roads and trails are threatened by trampling and maintenance activities. Any soil disturbance is likely to have a negative effect on this species due to the resultant erosion.

Blue Ridge Catchfly-Direct, Indirect and Cumulative Effects

Road relocation could impact individual plants, however, this plant has not been documented where construction activities are proposed to take place.

Blue Ridge Catchfly-Determination of Effects

As described in the Effects section above, it is my determination that due to protection and management direction provided in forest wide standards and the plants resistance and expected response to treatments likely to be practiced where it occurs, a determination of "may impact individuals but not likely to cause a trend to federal listing or a loss of viability" is made.

Alternative 2-No Action:

This alternative does not meet RLRMP standards or guidelines to maintain roads to a safe standard for public safety or to protect natural resources. Natural conditions would continue to occur-such as increased sedimentation and erosion into Spirits Creek. Public safety would continue to be at risk. There would be no known direct, indirect or cumulative effects to any TES species with implementation of the no-action alternative.

9. CONCLUSION

In all cases where new information on threatened, endangered, or sensitive species within the project area is disclosed, appropriate mitigation measures will immediately be implemented as well as any necessary changes in project proceedings.

10. SIGNATURE OF PREPARER

/s/ *Rhea S. Whalen* DATE: May 11, 2012

Rhea S. Whalen
District Biologist, Boston Mountain Ranger District

11. LITERATURE CITED, CONSULTATION, OTHER DATA SOURCES

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Whalen, James. Forest Fisheries Biologist, Ozark-St. Francis National Forest, Supervisor's Office, Russellville, Arkansas.

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13. APPENDIX B – OZARK NF TES SPECIES CONSIDERED BUT NOT EVALUATED

OKLAHOMA SALAMANDER – *Eurycea tynerensis*

Description: Small, clear, spring-fed streams with temperatures normally <24 C; at elevations below 305 m; substrate coarse sand, gravel, or bedrock; hides under or among rocks or in submerged vegetation (Bury et al. 1980). Typically in gravelly (primarily chert) substrates; inhabits interstices between stones and pebbles in coarse loose sand under cold swift shallow water; lives below substrate surface during drought (references cited by Tumlison et al. 1990). Surface populations most commonly found in shallow (<10 mm), slowly moving (usually <10 cm/sec) water with medium sized rocks (65-256 mm diameter), moderate degrees of embeddedness (about 50%), and with high densities of aquatic invertebrates (Tumlison et al. 1990). May use karst system to move within or between stream systems (Tumlison et al. 1990). Eggs are laid on undersides of rocks. In western Ozarks, surface populations apparently forage near stream edges and consume prey as available, especially chironomids, mayflies, and isopods; subterranean isopods also recorded in diet (Tumlison et al. 1990). [Nature Serve 2001]

Location: According to Bury et al. (1980), range includes the drainages of the Neosho and Illinois rivers, Springfield Plateau section of Ozark plateaus of southwestern Missouri (McDonald County), northwestern Arkansas (Benton, Washington, and Carroll counties), and northeastern Oklahoma (Adair, Cherokee, Delaware, Mayes, and Ottawa counties). However, preliminary electrophoretic data indicate that E. tynerensis is restricted to a few counties in eastern Oklahoma; populations in Arkansas and Missouri are not genetically distinct from E. multiplicata griseogaster (Wilkinson, in Figg 1991). Found only on the Wedington unit of the Boston Mtn. District

Comments: Regional endemic; Degree of Threat: Moderately threatened range-wide, habitat or community lends itself to alternate use. Threats: Threatened by direct habitat destruction (e.g., flooding by impoundments), and by activities (agriculture, urbanization, stream channelization, gravel removal) that result in silting or pollution of aquatic habitat (Bury et

al. 1980). Fragility: Fairly resistant (e.g. Northern Raven). Comments: Probably tolerant of nondestructive intrusion

Potential Habitat: There is less than 50 acres of potential habitat on the Forests.

G/T/N: 3

S Rank: 2

INTERIOR LEAST TERN - *Sterna antillarum athalassos*

Description: Interior populations nest mainly on riverine sandbars or salt flats that become exposed during periods of low water (Hardy 1957). As a result of vegetational succession and/or erosion, preferred nesting habitat typically is ephemeral.

Location: Mississippi and Arkansas River systems nests on sandbars. St. Francis only.

Comments: Since least terns always nest near water, they are vulnerable to flood inundation and seem to seek high ground. In coastal Texas, Thompson and Slack (1982) documented that the densest nesting area in 67% of the colonies was above the midpoint of available habitat.

Potential Habitat: Exclusive to sandbars, only on or adjacent to the St. Francis National Forest, less than 500 acres.

Critical Habitat: N/A

Current Range: AR, CO, IA, IL, IN, KS, KY, LA, MO, MS, MT, ND, NE, NM, OK, SD, TN, TX

Historic Range: Atlantic and Gulf coasts, Miss. R. Basin, CA), Greater and Lesser Antilles, Bahamas, Mexico; winters Central America, northern South America

Listing Status: Endangered

CRAYFISH – *Orconectes williamsi*

Description: A crayfish found in small, cool, shallow headwater streams or creeks with a high gradient.

Location: Known from the extreme headwaters of the White River in Madison County, Arkansas; Washington County, Arkansas, and Barry, Christian, Stone, and Taney counties, Missouri.

Comments: Some threat to habitat by increased recreational use of White River impoundments. Populations in Missouri are isolated and impoundments will prevent interpopulation gene flow. The area around Branson, Missouri is rapidly being developed.

Potential Habitat: Only known from the extreme headwaters of the White River in Madison County, Arkansas which is outside the project area and so does not require consideration.

G/T/N: 2

S Rank: Unknown

OZARK SHINER – *Notropis ozarcanus*

Description: A slender, silvery shiner with a large eye, rounded and blunt snout projecting beyond upper lip, and a small, nearly horizontal mouth. Has a slender body, with pale yellow dorsal coloration, silvery sides, and silvery white belly. It is endemic to the Ozark uplands of northern Arkansas and southern Missouri.

Location: Found in Madison and Newton Counties only.

Comments: Large streams and clear rivers with high gradient and permanent strong flows. Most common near riffles in slight to moderate current (runs and flowing pools) over firm silt-free bottom. Schools in midwater. Eliminated from many impounded areas. Harris and Smith (1985) studied the distribution and status of this species in the state. They noted that two out of the five known populations probably contain 500-1,000 individuals; the remaining three populations were much smaller (around 100 each). The Arkansas darter is definitely a rare species in the state and because of the limited habitat, is of special concern.

Potential Habitat: Occurs in the Buffalo River, White River adjacent to Sylamore RD, and Illinois River. Downstream effects should be considered for projects located in the Buffalo River watershed, and Sylamore RD watersheds draining directly to the White River. The population found in the Illinois River system is located in Osage Creek, upstream from the Wedington Unit of Boston Mountain RD, so species is upstream and off Forest, and no consideration is needed.

G/T/N: 3

S Rank: 3

SOUTHERN CAVEFISH – *Typhlichthys subterraneus*

Description: Small, eyeless, unpigmented fish with an elongate body, an elongate flattened head and a rounded caudal fin. Pelvic fins absent. Sensory papillae on caudal fin are in 2 rows. Scales very small and embedded causing skin to appear naked. Maximum size just over 3 inches (76mm.). Resembles the Ozark cavefish, but differs from it in having 2 rows of sensory papillae on the caudal fin. [Fishes of Ark.]

Location: Known from only 3 sites in Arkansas. Species is much more widely distributed outside of Arkansas. Inhabits limestone caves in pools and water of small streams over a rubble or clay bottom.

Potential Habitat: Five acres Forest-wide in waterfilled caves in the above described localities. Groundwater effects should be considered for any projects in areas that may drain into water-filled caves.

G/T/N: 3

S Rank: 1

NEARCTIC PADUNEILLAN CADDISFLY – *Paduniella nearctica*

Description: This species has been found in 2nd and 3rd order streams with 4 to 10 meters in width with permanently flowing streams that have gravel/cobble or bedrock substrate. The dominant vegetative type where the species is found is upland hardwood.

Location: The species has been collected in Lee Creek at Natural Dam in Crawford County, Mulberry River in Johnson County, North Sylamore Creek in Stone County. It has also been collected in the Middle Fork of the Little Red River in Searcy County. At this time the Boston Mountain, Pleasant Hill and the Sylamore districts have known populations. Ref (Interior Highland Trichoptera by Moulton & Stewart, Arkansas Natural Heritage Commission)

Potential Habitat: All of the watersheds listed above are potential habitats where it meets the criteria of the needs listed above.

G/T/N: 1

S Rank: 1

FAT POCKETBOOK - *Potamilus capax*

Description: A rounded, greatly inflated shell, thin to moderately thick, S-shaped hinge line, tan or light brown, rayless, and shiny.

Location: East and northeast Arkansas and the St. Francis River system. Currently found in the St. Francis River, upstream from the OSF National Forests, near Madison, Arkansas.

Comments: N/A

Potential Habitat: Not currently known from the St. Francis River adjacent to the St. Francis National Forest, only historical records. Current land uses within the St. Francis River drainage basin have degraded water quality to the point that no potential habitat for this species is expected in the lower reach of the river adjacent to the St. Francis National Forest. The surface acreage of the St. Francis River where it is adjacent to lands of the St. Francis National Forest is 212 acres. This should represent the extent to which this species could have been encountered historically.

Critical Habitat: N/A

Current Range: AR, IL, IN, KY, MO, MS

Historic Range: AR, IA, IL, IN, KY, MO, MS, OH

Listing Status: Endangered

NEOSHO MUCKET – *Lampsilis rafinesqueana*

Description: The Neosho mucket is found in second order or larger streams, with moderately flowing water over fine to medium gravel substrates.

Location: The Neosho mucket is a freshwater mussel endemic to the Illinois and Neosho River drainages in Arkansas, Kansas, Missouri, and Oklahoma. Wedington Unit of Boston Mtn.

only.

Potential Habitat: Potential habitat is about 5 acres Forest wide. Since all of the Wedington Unit drains into the Illinois River where the species is found, all projects proposed on the Wedington unit should be considered for downstream effects.

G/T/N: 2

S Rank: 1

GEOCARPON - *Geocarpon minimum*

Description: Geocarpon prefers eroded areas in grasslands called "slicks" or "slickspots". Bare soil over sandstone, slicks are high in salinity and may be the remains of ancient Pleistocene lakebeds. It is not known if these slicks are renewed by fire or flooding or if they eventually disappear. If they are renewed, then Geocarpon may be a pioneer species or one of the first plants to take root in a newly cleared habitat.

Location: This species has been found in only 4 Arkansas counties to include Drew, Bradley, Cleveland and Franklin Counties. This plant appears to be confined to south Arkansas and one site in Franklin County where it is found south of the Arkansas River and is not close to the Forest.

Comments: Vegetational succession appears to be the major threat to this tiny, inconspicuous plant. When grasses or shrubs encroach on a slick, the plant fails to compete. If slicks do indeed result from fire, then fire suppression would hasten encroachment of Geocarpon habitat.

Potential Habitat: Not found on Forest

Critical Habitat: N/A

Current Range: AR, LA, and MO

Historic Range: AR, LA, and MO

Listing Status: Threatened

BUSH'S POPPYMALLOW - *Callirhoe bushii*

Description: The usual habitat for this plant is rocky, open-woods, wooded valleys, ravine bottoms, and borders of glades.

Location: This plant ranges from extreme southwestern Missouri, to northwest Arkansas and northeastern Oklahoma. In Arkansas it has been noted in Benton, Washington, Carroll, Boone, Marion, Searcy, Conway and Logan Counties.

Comments: This species has often been noted in Washington and Benton counties on roadsides and is easily viewed from several county roads.

Potential Habitat: On the Boston Mountain Ranger District, habitat as described above is found on approximately 11,000 acres.

G/T/N: 3

S Rank: Unknown

TRELEASE LARKSPUR – *Delphinium treleasei*

Description: According to Smith (1989), this species is a calciphile, endemic to the southwestern Missouri and northwest Arkansas. It occurs on limestone glades and bald knobs in the White River region and on rocky open limestone exposures and glades elsewhere.

Location: This plant is known to occur only in Missouri and in 6 northwest Arkansas counties (Montgomery, Benton, Carroll, Fulton, Searcy, Stone, Madison, Boone, Marion, Baxter and Washington).

Potential Habitat: Based on CISC data for the Forests, there are about 4,200 acres of potential habitat.

G/T/N: 3

S Rank: 3

FRENCH'S SHOOTING STAR – *Dodecatheon frenchii*

Description: This species is found underneath ledges or bluff shelters where there is essentially no direct sunlight. Occasionally, it is found growing on top of the bluff line in shaded woods, but almost always it is found growing in the drip line of sandstone bluffs with northeast or eastern exposure. Usually there is little competition from other plant species.

Location: Globally it is found in southern Illinois; Carter County, and in Arkansas: Kentucky; Newton and Cleburne Counties.

Potential Habitat: CISC database queries resulted in 15 acres of potential habitat in or around site specific occurrences within the Administrative Boundaries of the Forests.

G/T/N: 3

S Rank: 2

OPEN-GROUND DRABA (OPEN-GROUND WHITLOW GRASS) – *Draba aprica*

Description: Generally, the soil in most places where *Draba aprica* grows is too thin to support a continuous cover of large trees, and it is exposed to at least partial sun.

Location: According Smith (1989) this species has been reported in six counties: Washington, Polk, Montgomery, Cleburne, Faulkner and Drew. Also known in Stone County.

Potential Habitat: Potential habitat would primarily occur on glades and open areas on Districts where the species has been found; approximate habitat for this species would be less than 100 acres based on known occurrences on the Forest.

G/T/N: 3

S Rank: 2

LARGE WITCHALDER – *Fothergilla major*

Description: A colonial shrub with stellate pubescent twigs. Leaves usually glabrate above, stellate pubescent below, acute, usually coarsely lobed, entire near base, base cordate to widely cuneate, petiolate. Spikes densely flowered, short-pedunculate. Flowers mostly imperfect, calyx tube cupulate, petals absent, stamens numerous, filaments white, conspicuous, clavate. Fruit a capsule with a persistent beak.

Location: *Fothergilla major* is rare throughout its range of five southeastern states (disjunct in Arkansas). This taxon does occur in a national protected area in Tennessee and at least two state parks in North Carolina. Only known from Searcy County in Arkansas.

Potential Habitat: Fothergilla major has a somewhat limited range and number of known occurrences, making it vulnerable to land-use conversion, habitat fragmentation, and forest management practices; conversion of natural forests to commercial forest land has probably impacted the species (Southern Appalachian Species Viability Project 2002). Habitat is unsuitable for most uses (Tennessee Element Ranking Form, Edwin Bridges, 1983). Only known from Searcy County, Arkansas, which is outside the project area and so does not require consideration.

G/T/N: 3

S Rank: 1

BUTTERNUT - *Juglans cinerea*

Description: Occurs in rich woods along the base of slopes or bluffs, and along streams. This plant flowers April until late May. Pith of branches is dark brown, the brown part about as thick as the separating partitions. Bark is gray with smooth ridges. Upper part of leaf-scar of the previous years leaves with a mustache-like mat of hairs.

Location: Ranges from New Brunswick to North Dakota, south to Georgia and Arkansas. In Arkansas, it is found in most counties along Crowley's Ridge, Stone and Baxter counties with reports from Marion and Benton Counties in northwestern Arkansas.

Comments: Limited distribution of the plant.

Potential Habitat: This species is found in several locations on the St. Francis National Forest and on the Sylamore Ranger District in north central Arkansas. One report of Butternut on the Wedington unit has remained unconfirmed despite numerous surveys. Based on limited occurrence and specific habitat attributes, potential habitat is limited to about 100 acres forest wide.

G/T/N: 3-4

S Rank: Unknown

MAPLELEAF OAK - *Quercus acerifolia*

Description: Open woods, ledges and cliff edges, and the rocky edges of plateaus.

Location: Found in Sebastion, Logan, Pope and Montgomery counties. This species is endemic to Magazine Mountain and the Ouachita Mountains, Arkansas, with six total occurrences and a few hundred individuals. Known on the Ozark NF only on Mt. Magazine.

Potential Habitat: This plant could possibly occur on similar sites on the Magazine district but because of the limited available habitat, there is likely less than 30 acres of available habitat on the Magazine Ranger District of the Ozark National Forest.

G/T/N: 1

S Rank: 1

BAY STARVINE (CLIMBING MAGNOLIA) - *Schisandra glabra*

Description: *Schisandra glabra* is a vine that occurs in the Atlantic and Gulf Coastal plains from North Carolina south to northern Florida, west to Louisiana and up the Mississippi Embayment into western Tennessee and east Arkansas. This plant is found in open woods in mixed hardwood stands where little vine competition is present. It will rarely if ever be found with Japanese honeysuckle or Kudzu.

Location: Occurs only on the St. Francis National Forest and is confined to the ridge and is often found in small side-drainages but rarely in open bottomland hardwoods.

Potential Habitat: Approximately 11,000 acres.

G/T/N: 3

S Rank: 2-3

BLUE RIDGE CATCHFLY (OVATE-LEAF CATCHFLY) – *Silene ovata*

Description: Range of this sensitive species is from Virginia south and west to Georgia, Alabama, Mississippi and Arkansas. The plant is primarily restricted to the Appalachian physiographic region. Favorable habitat would include talus slopes beneath a sandstone bluff line.

Location: Guide to Vascular Plants of the Blue Ridge, Wofford, B. Eugene. U of GA Press, 1989 "…that Silene Ovata is found in rich woodlands infrequently in GA, NC, and TN". Benton, Baxter, Newton, Pope, Cleburne, Stone and Van Buren Counties are where there are known occurrences.

Potential Habitat: Based on buffering known populations on the Sylamore, Buffalo and Bayou RD, Potential habitat could equal about 90 acres.

G/T/N: 3

S Rank: 2

SPECTACLECASE - (Cumberlandia monodonta)

The decline of the spectaclecase in the Mississippi River system and other mussel species in the eastern United

States is primarily the result of habitat loss and degradation. These losses have been well documented since the mid-19th century. Chief among the causes of decline are impoundments, channelization, chemical contaminants, mining, and sedimentation (Williams et al., 1993; Neves, 1993; Neves et al., 1997; Watters, 2000.
Location: Formerly on the Mulberry River in Johnson, Crawford and Franklin Counties.
Potential Habitat: Mulberry River.
G/T/N:2/3
S Rank: 1

OUACHITA MOUNTAIN GOLDENROD - *Solidago ouachitensis*

Description: This plant is found in very mesic forests on north-facing slopes of the mountains (Ouachita).

Location: Endemic to the Ouachita Mountains of Arkansas and Oklahoma and is known from fewer than thirty occurrences.
Potential Habitat: Past surveys on the Magazine Ranger District have failed to note its presence there. Habitat on that district is limited to north slopes and is less than 5,000 acres.

G/T/N: 3

S Rank: 3

OZARK LEAST TRILLIUM – *Trillium pusillum var. ozarkanum*

Description: This species occurs in acid soils of shallow draws in the cherty-flinty soils of oak-hickory, oak-pine, or oak-chestnut woodland of the Ozark region.

Location: This plant is known to occur only in Missouri and in 6 northwest Arkansas counties (Montgomery, Benton, Carroll, Fulton, Searcy, Stone, Madison, Boone, Marion, Baxter and Washington). It occurs on limestone glades and bald knobs in the White River region
Potential Habitat: Based on buffering known populations on the Sylamore and Boston Mtn RD's, potential habitat could equal about 60 acres.

Nuttall's Cornsalad (*Valerianella nuttallii*)

Habitat Relationships and Limiting Factors

This plant is restricted to western Arkansas. It was formerly reported in eastern Oklahoma; however, occurrences have not been confirmed there recently.

It has not been found on Ozark-St Francis NFs. The Bayou, Boston Mountain, Magazine, and Pleasant Hill Ranger Districts have limited potential habitat along stream bottoms in mixed hardwood stands.

Main threats to this species include the use of chemical herbicides and fertilizers, the loss of field margin refuges, the decline of traditional systems of crop rotation, earlier harvests, and the introduction of extremely competitive crop plants.

Habitat Relationships and Limiting Factors

This plant is found in very mesic forests on moist, well-drained, gravelly soils in shaded, north-facing slopes that are significantly cooler during the hot summer weather than less shaded areas.

Ouachita Mountain goldenrod occurs in the Ouachita Mountains of Arkansas and Oklahoma and can be found in Polk and Montgomery Counties in Arkansas, and in LeFlore County in Oklahoma.

Past surveys on the Magazine Ranger District have failed to note its presence there. Habitat on that district is limited to north slopes and is less than 5,000 acres.

Because this species is already found in a very narrow habitat range, anything that decreases the size of its suitable habitat could threaten its continued survival. This could include loss of habitat due to development as well as global warming.

Royal Catchfly (*Silene regia*)

Habitat Relationships and Limiting Factors

This midwestern endemic of tall grass prairie habitats with relatively few, scattered populations are most abundant in Missouri; extirpated from Kansas and Tennessee, and considered quite rare in all other states in it's range. Many remaining population remnants are along roadsides where vulnerable to construction or to changes in management of roadside vegetation.

This species is known from Benton, Boone, Bradley, Hot Springs, Newton, Searcy, Sharp, Stone, and Washington Counties in Arkansas. There are very few known locations for this plant on the Forests.

The major threat to this species is habitat destruction through agricultural practices. Prairies are no longer extensive in the Midwest and this plant species is now found principally along roadsides where prairie vegetation still occurs. Other right-of-way maintenance activities such as herbicide application (used to maintain railroad and power line rights-of-way and roadsides) and untimely mowing are additional threats Woody plant encroachment into open prairie areas is a significant threat to existing royal catchfly populations. Maintenance of open areas through the natural fire regime has generally not occurred for well over a century and successional change is taking place. An increase in shade levels caused by woody vegetation (shrubs, trees, and vines) encroachment has reduced reproductive vigor of some extant populations.

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APPENDIX C. Glossary of Terms and Acronyms

Best Management Practices - Practices determined by a state or designated area-wide planning agency to be the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals.

Biodiversity - A relative abundance and variety of species, both plant and animal, in a given area.

Biological Evaluation - A specific process required as a part of an environmental assessment that evaluates the potential effects of a proposed project on Proposed, Endangered, Threatened, and Sensitive species and their habitats.

Cultural Resource - The remains of sites, structures, or objects used by humans in the past.

Cumulative effects or Impacts - Impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or nonfederal or person) undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Decision notice - The written record of the decision made after a federal agency completes an environmental assessment. The deciding officer chooses one of the alternatives, or a blend of the alternatives and the decision may be appealed by the public. The Forest Service combines the decision notice with the FONSI (Finding of No Significant Impact) required by NEPA.

Diversity - The distribution and abundance of different plant and animal communities and species within an area.

Easement - An interest in real property that conveys use, but not ownership, of a portion of an owner's property.

Emergency Relief of Federal Owned Roads (ERFO) A program established by the federal government to assist Federal agencies with the repair of federal roads damaged due to catastrophic natural events such as floods.

Habitat - The area where a plant or animal lives and grows under natural conditions. Habitat consists of living and non-living attributes, and provides all requirements for food and shelter.

Interdisciplinary Team (ID Team) - A group of individuals with different training assembled to solve a problem or perform a task. The team is assembled out of

recognition that no one scientific discipline is sufficiently broad to adequately solve the problem.

Management plan - A plan guiding overall management of an area administered by a federal or state agency; plan usually includes objectives, goals, standards and guidelines, management actions, and monitoring plans.

Mitigation - Includes: (a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or elimination of the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments.

National Forest Management Act (NFMA) - A law passed in 1976 as an amendment to the Forest and Rangeland Renewable Resources Planning Act, requiring the preparation of Regional Guides and Forest Plans and the preparation of regulations to guide that development.

Public involvement - A Forest Service process designed to broaden the information base upon which agency decisions are made by (1) informing the public about Forest Service activities, plan, and decisions, and (2) encouraging public understanding about and participation in the planning processes which lead to final decision making.

Riparian - Pertaining to areas of land directly influence by water or influencing water. Riparian areas usually have visible vegetative or physical characteristics reflecting this water influence. Stream sides, lake borders, or marshes are typical riparian areas.

River Corridor - Land adjacent to the Wild and Scenic River, managed along with the river to maintain and/or enhance the outstandingly remarkable values of the river.

Watershed - The entire land area that contributes water to a drainage system or stream.