United States Department of Agriculture

Ameren Powerline Reconstruction Project

Preliminary Environmental Assessment for Public Comment

Grand Tower–Makanda North Line in Township (T) 10 South (S), Range (R) 4 West, Sections 12, 13; T10S, R3 West, Sections 7, 8, 9, 12, 13, 14, 15, 16, 17, 23, 26, 27; T10S, R2 West, Sections 7, 8, 9, 10, 11, 15, 16, 17, 18

Forest Service	Shawnee National Forest	Grand Tower–Makanda North Line*	November 2014

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Ameren Powerline Reconstruction Project
Preliminary Environmental Assessment for Public Comment
Shawnee National Forest

November 2014

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Grand Tower–Makanda North Line in Township (T) 10 South (S), Range (R) 4 West, Sections 12, 13; T10S, R3 West, Sections 7, 8, 9, 12, 13, 14, 15, 16, 17, 23, 26, 27; T10S, R2 West, Sections 7, 8, 9, 10, 11, 15, 16, 17, 18

This document and supporting documents can be found on the Shawnee National Forest Website.

Table of Contents

Acronyms iv
Introduction 1
Chapter 1 – Purpose Of And Need For Action 3
Background 3
Problem Statement 3
Purpose and Need 3
Public Involvement 4
Public Issues 4
CFR 218 Pre-Decisional Objection Process 5
Decision Framework 5
Chapter 2 – Alternatives 7
Alternative 1, No Action 7
Alternative 2, Proposed Action 7
Structures 7
Access Routes 8
Land Use Authorization 9
Alternatives Eliminated from Detailed Study 10
Comparison of Alternatives 10
Chapter 3 – Affected Environment And Environmental Consequences 13
General Affected Environment for the Project Area 13
Wildlife and Aquatic Resources Analysis 14
Affected Environment 15
Effects Analysis 26
Access Routes and Transportation System 36
Affected Environment 36
Effects Analysis 37
Botany 38
Affected Environment 38
Effects Analysis 39
Heritage and Cultural Resources 42
Affected Environment 42
Effects Analysis 42
Soil and Water Resources 44
Affected Environment 44
Effects Analysis 46
Chapter 4 – List Of Preparers 51
Chapter 5 – References 53
Appendix A – Design Criteria 73
Access Routes and Transportation System 73
Heritage and Cultural Resources 73
Botany 73
Soil and Water Resources 73
Wildlife and Aquatic Species 75
Appendix B – Project Maps 79

List of Tables

Table 1. Comparison of Alternatives 10
Table 2. Proposed action management areas[5] 15
Table 3. Project area management emphasis and habitat conditions by the four analysis areas 17
Table 4. Issue indicators used to measure wildlife effects 26
Table 5. Federally threatened and endangered and regionally sensitive species evaluated 28
Table 6. Illinois state listed species and forest species with viability evaluation 29
Table 7. Forest management indicator species evaluated 29
Table 8. Analysis area road miles and clearing1 31
Table 9. Effects determination summary 33
Table 10. Cumulative effects summary 35
Table 11. Sixth field watersheds comprising the cumulative effects analysis area (CEA) 48

List of Figures

Figure 1. Ameren project vicinity map 2
Figure 2. Wildlife analysis areas 16
Figure 3. Fountain Bluff analysis area 19
Figure 4. Big Muddy analysis area 21
Figure 5. Cedar Creek analysis area 23
Figure 6. Cave Creek analysis area 25
Figure A- 1. Powerline row maintenance map for design criteria 78
Figure B- 1. Map 1, Structures 4-7 79
Figure B- 2. Map 2, Structures 21-40 80
Figure B- 3. Map 3, Structures 41-62 81
Figure B- 4. Map 4, Structures 57-84 82
Figure B- 5. Map 5, Structures 69-90 83
Figure B- 6. Map 6, Structures 96-102 84

Acronyms

FS	Forest Service
SNF	Shawnee National Forest
RFSS	Regional Forester Sensitive Species
IDNR	Illinois Department of Natural Resources
IDT	Interdisciplinary Team
ROW	Right-of-way, rights-of-way
MA	Management area
FR	Forest roads
T&E	Threatened and endangered species
NFS	National Forest System
USDA	United States Department of Agriculture
EA	Environmental Assessment
NEPA	National Environmental Policy Act
O&M	Operations and Maintenance
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
NRCS	Natural Resources Conservation Service
MIS	Management indicator species
TES	Threatened, endangered, and sensitive species

Introduction

The USDA Forest Service, Shawnee National Forest (SNF) is analyzing a request from Ameren Services (Ameren), a group within Ameren Illinois Company, to reconstruct an existing utility line (also referred to as the powerline) that crosses National Forest System (NFS) lands and private lands (Figure 1). To ensure appropriate oversight of the proposed project and future operation of the utility line, the Forest Service is proposing to issue a new land use authorization (special use permit) to Ameren Illinois Company, the applicant.

An interdisciplinary team (IDT) of Forest Service resource specialists completed the environmental analysis and prepared this preliminary environmental assessment (EA) for public comment in compliance with the National Environmental Policy Act (NEPA), the Council of Environmental Quality (CEQ) regulations, and other relevant federal and state laws and regulations. Two key components of NEPA are public involvement and disclosure of potential environmental effects. An interdisciplinary team fully evaluated and disclosed the environmental effects of the proposed project based upon field study, resource inventory and survey, public response to scoping, the best available science, and professional expertise. The results of the analysis presented herein, and the public comments received on this EA, will help the Responsible Official determine whether implementation of the project may significantly affect the quality of the human environment and thereby require the preparation of an environmental impact statement.

This EA is an analytical, science-based document that presents the analysis of resource issues and concerns, and further discloses the direct, indirect and cumulative environmental effects that may result from implementation of the proposed action and alternatives [40 CFR 1500.1(b); 1500.4(b), (c)]. Scoping was conducted to gather comments on our proposed action; three responses were received. The Responsible Official has determined that most issues and concerns identified to date may be addressed through design criteria. As a result, he decided that this preliminary EA would be a focused EA that would only need two alternatives analyzed and described in detail: the Proposed Action and the No Action alternative. Supporting documentation, including specialist reports with analyses of project area resources, any relevant technical and scientific papers, the special use permit application from Ameren , and other pertinent data and scientific references, will become part of the project record filed at the Shawnee National Forest Supervisor's Office, 50 Highway 145 South, Harrisburg, Illinois. Key documents for immediate public review may be found on the SNF website. This document begins with three chapters:

***Chapter One, Purpose of and Need for Action**:* Includes information on the history of the project, the problem that the proposed activities is intended to remedy, and the purpose of and need for the proposal. This chapter details the SNF's public involvement efforts and defines any unresolved issues developed from public comments. It also discusses the objections process and what decisions the Responsible Official will make.

***Chapter Two, Alternatives**:* Provides a description of the proposed action as well as any alternatives developed to address public issues. It includes a table summarizing the environmental consequences associated with each alternative.

***Chapter Three, Affected Environment and Environmental Consequences**:* Begins by describing the affected environment (existing condition) for each resource area. It then discloses all potential direct, indirect and cumulative effects.

These chapters are followed by important disclosures, the Finding of No Significant Impact, and a list of references and appendices that clarify and support the analysis. This focused preliminary EA is being made available for public comment for a mandatory 30-day period. Comments received on his document will be analyzed and incorporated into the final EA.

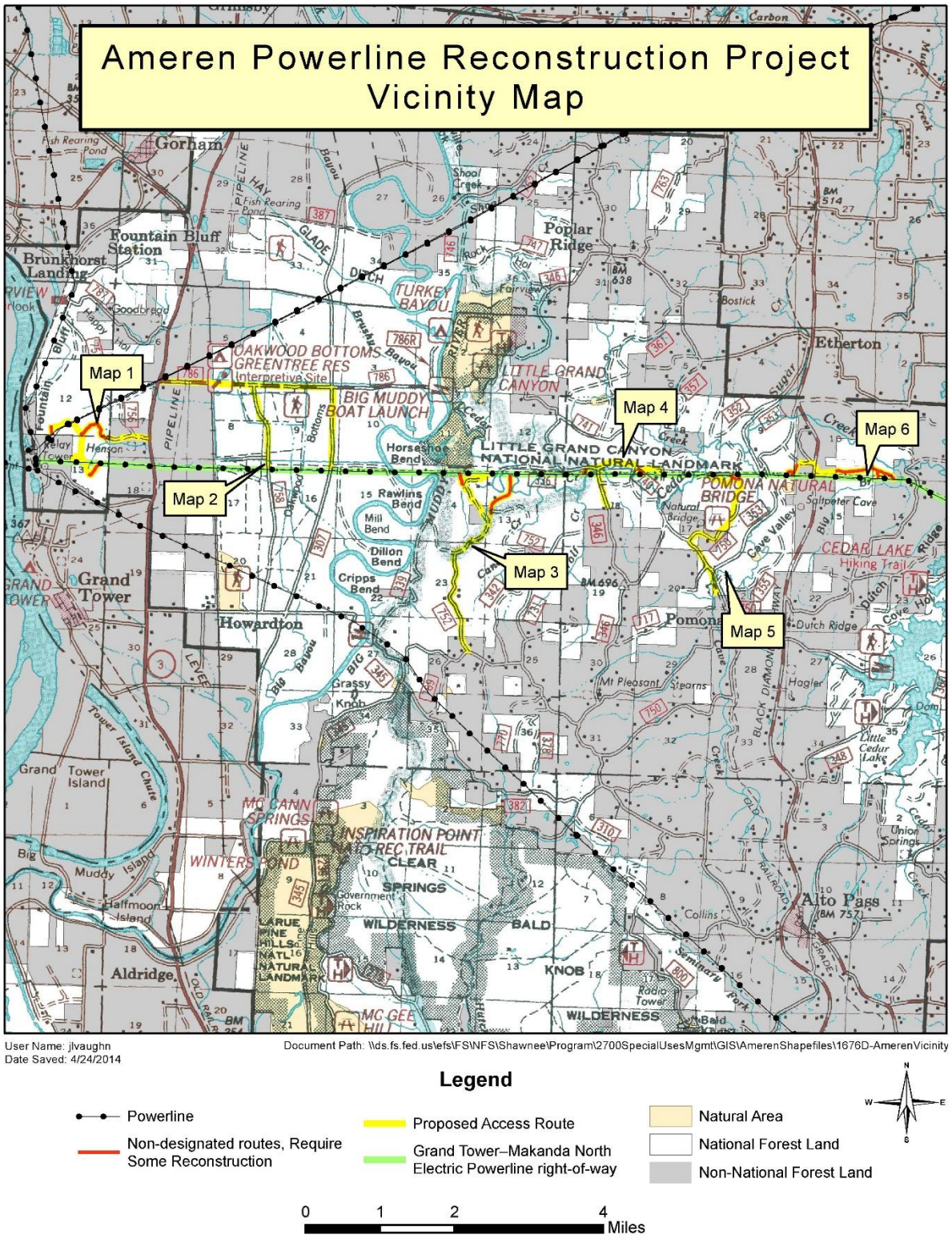

Figure 1. Ameren project vicinity map

See maps 1-6 in Appendix B

Chapter 1 – Purpose Of And Need For Action

Background

Ameren Illinois Company is a regulated electric and gas delivery company based in Collinsville, Illinois. Their parent company is Ameren Corporation located in St. Louis, Missouri. As a delivery company, Ameren is in the business of energy distribution. It serves about 1.2 million electric and 806,000 natural-gas customers in more than 1,200 communities within a 43,700-square-mile territory. Their complex delivery system includes about 4,500 miles of transmission lines and 45,400 miles of distribution lines. They also have natural gas transmission and distribution mains, and underground natural gas storage fields.

In 1950, the Central Illinois Public Service Company applied for and was granted a special use permit to construct, maintain, and operate a 130KV, 3-phase electrical powerline on approximately 3 miles of National Forest System (NFS) lands on the Shawnee National Forest. Over the years, amendments to the permit added line for the number of growing customers, and additional permits allowed for new corridors at other locations on NFS land. Consolidation in the industry occurred over the years and resulted in forming Ameren Illinois Company on October 1, 2010.

The project area for this proposal will be the Grand Tower–Makanda North electric powerline right-of-way (ROW) as it lies on NFS lands, and will include adjacent NFS and private lands impacted by the proposed action (Figure 1). It lies in Township 10 South, Range 4 West, Sections 12, 13; Township 10 South, Range 3 West, Sections 7, 8, 9, 12, 13, 14, 15, 16, 17, 23, 26, 27; and Township 10 South, Range 2 West, Sections 7, 8, 9, 10, 11, 15, 16, 17, and 18. This line provides reliability and energy transaction support for southern Illinois. The Grand Tower–Makanda North line consists of 16.9 miles of 138,000 volt circuit extending from the Grand Tower Switchyard to the Makanda, North Substation. Approximately 9 miles of this powerline is in an existing special use permitted right-of-way (ROW) within the SNF (refer to Appendix B for all project maps including the vicinity map). In 2008, Ameren was reissued a permit renewal consolidating several existing utility corridors on what was then the Mississippi Bluffs Ranger District, to include the Grand Tower–Makanda North line. Since then, the Forest has reorganized, and the Ameren permit is now administered from the Hidden Springs Ranger District office in Vienna, IL.

Problem Statement

Concerns over the amount of ground clearance of powerlines along Ameren's Grand Tower–Makanda, North line, as well as other sections of their powerlines, have been raised in the recent past. As part of Ameren's response plan to North American Reliability Corporation (NERC) Alert FAC-008, a survey of existing ground clearances for the Grand Tower–Makanda, North line was completed in 2012. The engineering evaluation of the survey data identified the need for higher capacity conductor and greater clearances to meet National Electric Safety Code (NESC) requirements at the rating necessary to support reliability of the Bulk Electric System. In addition, these improvements are necessary to comply with NERC planning standards as determined by Transmission Planning studies.

Purpose and Need

The purpose of and need for the Ameren Powerline Reconstruction Project is to bring the powerline into compliance with National Electric Safety Code (NESC) requirements and address the safety issues related to the ground clearance concerns. This proposal is also needed to provide for the issuance of a new land use authorization (special use permit) to Ameren Illinois Company. This new land use authorization (permit) would ensure that all operation and maintenance activities for this powerline are in compliance with regulation (USFS Special Uses Handbook 2709.11 and USFS Manual 2700). The Forest will develop an

Operation and Maintenance (O&M) Plan as part of the permit that will help provide the necessary oversight of project construction and future operation and maintenance of the utility line and ROW.

Public Involvement

In April, 2014, the Forest mailed notice to about 265 individuals and governmental and non-governmental organizations regarding the proposed Ameren Powerline Reconstruction Project and asked for comments on the proposal. The scoping letter, attachments and maps were posted on the Forest's website. In addition, the proposal was listed on the SNF Schedule of Proposed Actions (SOPA), available on the Forest's website, and will continue to be listed until a decision is rendered.

Three scoping responses were received and analyzed by the IDT to identify issues. One letter, from the State of Illinois Department of Natural Resources (IDNR), raised a number of concerns. A letter from the Illinois Nature Preserves Commission encouraged the Forest to support the recommendations put forth by IDNR. A third anonymous comment simply offered a suggestion to consider improving habitat for butterflies while performing work on access roads and the powerline ROW. A detailed Content Analysis was completed; documentation may be found in the project record. All substantive comments will be addressed and responded to in the various resource sections of Chapter 3. All public responses may be found in the project record.

Public Issues

An issue is defined as a disagreement or dispute regarding anticipated resource effects resulting from implementing a proposed action. Issues are usually identified based on comments from the public or other agencies. Resource concerns are also identified by the Forest Service IDT and included in the analysis. For purposes of developing this preliminary EA, public comments have been separated into two issue categories:

1. Key issues are those that remain unresolved at the time of the EA analysis and may be addressed with the development of an alternative(s) and/or mitigation measure(s). Unresolved issues meet the intent of the Council for Environmental Quality (CEQ) NEPA regulations at 40 CFR 1500.1(b) and 1500.4(g).
2. Non-key issues are those that are not addressed in the environmental analysis or are only briefly discussed. The CEQ NEPA regulations at 40 CFR 1501.7(a)(3) allow for issues to not be included in the detailed analysis or can be only briefly discussed if they are: a) outside the scope of the Proposed Action; b) already decided by law, regulation, Forest Plan, or other higher level decision; c) irrelevant to the decision to be made; or d) conjectural and not supported by scientific or factual evidence.

Six key issues were identified during public scoping and were approved by the Responsible Official. They will focus the environmental effects analysis on the relevant resources of concern in the EA. Also listed where appropriate are the indicators used in the detailed analysis to focus the disclosure of effects.

Issue 1: There is concern that the proposed activities could adversely affect endangered or threatened bats.

Indicator: Effects to individuals, hibernacula, and roosting, foraging, swarming habitat.

Issue 2: There is concern that the proposed activities could adversely affect the state-listed threatened Timber Rattlesnake.

Indicator: Effects to individuals and suitable den and foraging habitat.

Issue 3: There is concern that the proposed activities could adversely affect the state-listed endangered Eastern woodrat and the state-listed rice rat.

Indicator: Effects to individuals, ravines and forested floodplain habitat, and wetlands.

Issue 4: There is concern that the proposed activities could adversely affect migratory birds, including State-listed threatened and endangered species.

Indicator: Effects to individuals and their associated habitat.

Issue 5: There is concern that the proposed activities could adversely affect a number of State-listed plant species.

Indicator: The amount and type of disturbance and its potential impact on the affected species.

Issue 6: There is concern that the proposed activities could adversely affect designated natural areas.

Indicator: The identification of the designated natural areas and the magnitude of potential impact to these areas.

CFR 218 Pre-Decisional Objection Process

Recent rulemaking in 2013 replaced the post-decisional appeals process in place since 2003 (36 CFR 215) with a pre-decisional objection process (36 CFR 218) for EA level NEPA decisions. Rather than being able to file an "appeal" and seek higher-level administrative review of unresolved concerns after a project decision has been made, those who are eligible will now be able to file an "objection" and seek that review while the project decision is still in draft status.

The 36 CFR 218 regulations state that in order to be eligible to object under the Objections process, you will need to submit timely "specific written comments" (36 CFR 218.2) during any period "designated for public comment" (36 CFR 218.5(a)). The following two public opportunities to submit written comments have been or will be provided for this project:

1. **Scoping Period:** Those who submitted comments during the scoping period designated from on or about April 28, 2014 through May 30, 2014 initiated by the April 25, 2014 Scoping Notice have standing to file an objection.
2. **30-Day Notice and Comment Period:** Those who submit comments during the formal 30-day notice and comment period for this preliminary EA for public comment will have standing to file an objection. This 30-day period has been initiated by a legal notice in our newspaper of record, The Southern Illinoisan. Comments submitted now will be used to identify any issues with the proposal or associated environmental analysis so the EA can be finalized and a draft Decision Notice (DN) can be prepared.

Decision Framework

the Responsible Official will make the following decisions after conducting and reviewing the environmental analysis, including public involvement and interdisciplinary resource specialists' input:

- Whether the proposed project will proceed as proposed, as modified to address issues, or not at all. This would include the proposed project construction activities and the issuance of a new special use permit.
- Identification of specific resource protection measures and design criteria to be implemented for the project. Many of these measures would be included in the O&M Plan.
- Designation of monitoring requirements, if any, that would be applied for project implementation and for operation and maintenance of the powerline through the special use permit.

If comments meeting the requirements for objection standing are received, the Responsible Official will publicly distribute the Final Environmental Assessment and a Draft Decision Notice and Finding of No Significant Issues during a 45-day objection period. Anyone who submitted timely specifically written comments during the designated opportunities for public comment will be eligible to file objections. Assuming objections are resolved, the Responsible Official will then be able to sign the Final DN and implementation may begin.

Chapter 2 – Alternatives

This chapter describes each alternative and compares the alternatives considered.

Alternative 1, No Action

Under this alternative, the powerline (conductor and wires) and its support structures would not be replaced. Those structures having reached, or are near to, their end-of-life would not be replaced with structures of adequate height and strength; therefore, improvements to the transmission lines identified in the NERC report as necessary for long-term operation of the powerline would not be completed at this time. Fire danger associated with low-hanging powerlines would continue to exist. No access routes would be improved or managed in accordance with best management practices.

We would continue to implement current Forest Plan management direction for the project area. Resource projects would continue to be developed and analyzed through the NEPA process. The current existing condition would be affected by natural events and continuing ongoing management.

Should the No Action alternative be selected, no new special use permit would be issued and no needed improvements to the powerline would be authorized. Should Ameren desire or need to again seek authorization for the necessary improvements to the utility line, they would have to address the conditions or environmental issues that resulted in the no action decision. Another NEPA process (or a supplemental to this process) would need to be initiated. Ongoing maintenance, including road maintenance and mowing of the right-of-way (ROW), would continue according to the existing land use authorization (special use permit).

Alternative 2, Proposed Action

The Ameren Project proposed action can be described in three components. The first describes the work that would be needed on the structures, primarily the support structures and electric wires. The second describes the work that would be needed on the access routes. The third component details how the land use authorization would be issued. Maps of the proposed action are in Appendix B.

Structures

In order to meet the purpose and need for the project, Ameren is proposing to replace the existing powerline conductor with a higher capacity conductor (type 556 ACSS). Approximately 145 existing wooden H-frame structures supporting the powerline, within the ROW, would be replaced with taller structures to obtain adequate ground clearance at the required line rating. The remainder of the structures on this line have reached end-of-life and would be replaced with structures of adequate height and strength. Wooden poles would mostly be installed, but some “hybrid” (concrete base, steel top) poles would be used in areas that are identified as most susceptible to flooding and difficult to reach for maintenance. To obtain the adequate ground clearance, the replacement structures would be about 20 to 30 feet taller than the existing ones.

Most of the new structures would be replaced nominally within 5 feet of each existing structure. However, there are a few cases where this distance would be farther. Typically, the structure construction area is confined to an area of about 100 feet in width and 200 feet in length along the right-of-way centered on the structure location. Four individual structures, numbers 31, 48, 56, and 96 (Appendix B, Maps 1-6) will be changed to Deadend Storm Structures. A typical Deadend Storm Structures would have three uprights instead of two, and guy wires to support the structure. These four structures would have a larger overall footprint than the common H-frame structure.

Due to the new structures having a slightly larger span between the uprights, use of the existing pole holes is not an option. This will, therefore, require the boring of new holes at the new structure locations. A large

drilling vehicle would be driven in to bore the holes. The borings for the wooden structures would be about 9 to 15 feet deep. The hole would be back filled with about 5 feet of crushed rock; spoils/soil from the hole would be used for any additional backfill.

Hybrid pole construction would require a different process than for the wooden structures. There would be 12 locations with 2 drilled shafts to be installed at each location. The drilled shafts would be about 18 to 22 feet deep. A large drilling vehicle would be needed onsite for this activity. Due to the presence of sand and water at these drilling locations, a polymer slurry drilling method would be used. This includes the use of water and a polymer slurry additive to keep the shafts open while drilling. The slurry material is environmentally friendly and biodegrades in a few days. The spent slurry would be hauled off-forest and disposed of by Ameren. A considerable amount of water would be needed to complete this construction. Temporary holding tanks (Adler tanks) capable of holding 21,000 gallons of water would be used at each of these locations. A water tanker would transport water to the site.

Once the poles are installed, the existing wires would be replaced with new wire. To accomplish this, the old wire would be used to pull in the new wire. Ameren would set up wire pulling equipment about every two miles. After the new wire is pulled and connected to the new structures, the old structure (poles) would be removed and the existing holes filled with rock and covered with native soils. Typically, a small amount of rock is placed in the bottom of the hole and covered with the spoils from the new hole. If the pole cannot be removed, the pole would be cut at ground grade and the subsurface portion of the pole left in place. The replaced poles would be removed from the site and disposed of by Ameren.

The equipment and vehicles necessary to support the proposed project activities range in size from smaller crew trucks to large bulldozers, excavators, drilling machines, transport trucks, cranes, and water tankers. Much of the larger equipment is track-mounted to minimize damage to the ROW and to improve mobility.

Access Routes

To replace the powerline structures, Ameren would need to access each of 145 pole locations with a pole carrier, a drilling truck and two bucket or crane trucks. Most of this access would be gained by driving these vehicles in the existing powerline ROW from one pole location to the next. However, natural terrain features, such as bluffs, cliffs, ravines, rivers, and creeks dissect the ROW, which prevent driving directly from one pole location to the next for the length of the ROW. Therefore, different access routes would be needed. A number of existing access routes to the ROW are currently available; no new access routes would be constructed. Some of the existing access routes proposed for continued use are not intended for regular vehicle traffic, and some are closed to public access altogether. Therefore, they are rarely driven, and vegetation has encroached in the route corridor. In addition, some route surfaces are native soil and would require hardening with gravel or rock to sustain the proposed project activities. Nearly all the proposed access routes require some level of improvements such as spot graveling, cutting back encroaching vegetation, blading-out existing ruts, installing additional erosion control features, and widening the road bed to support the width of Ameren's work vehicles. Area maps 1 through 6 (Appendix B) show the access routes needed to reach the ROW, and the level of work needed to prepare these routes for use by heavy equipment such as drilling rigs, excavators, and transport trucks.

The proposed access routes vary in their use, maintenance levels, and jurisdiction. These include National Forest System (NFS) roads (varying levels/conditions), old routes created in the past for Forest Service (FS) administrative purposes and not formally designated on the National Forest System (non-designated roads), private roads, or county roads. Many of the NFS roads have not been regularly maintained. Most of the proposed access routes are located in hardwood forests and consist of dirt, gravel, or crushed limestone surfaces. Many of the county roads are oil and chip, others are gravel. In the analysis area, the proposed routes include approximately 3 miles of Level One roads (Forest Service administrative use only, closed year round to public motor vehicle use), 4 miles of Level Two roads (open to high clearance vehicles, seasonally

closed for resource protection), 4 miles of Level Three roads (open for low clearance vehicles), and 3 to 4 miles of Non-Designated roads (not designated on the National Forest System, closed year round to the public) for a total of about 14 to 15 miles that have been proposed for use and may be subject to some level of improvement.

A minimum width of 12 feet would be needed for vehicle access over most of the access roads. To transport the 90- to 100-foot-long structures (poles), road width would need to be wider on corners. On the sharpest corners (U-shaped if needed), it is anticipated that a maximum turning radius of about 150 feet would be needed, requiring that curves be gradual. The width of the road at all locations determines the need for removing trees and vegetation. Slightly over 1,150 trees with diameters over 5 inches would be removed to make the necessary improvements to the access routes that will accommodate passage of the equipment and the long power poles. Additional trees less than 5 inches in diameter would also be removed as needed. Access in the ROW would be confined as much as possible to a 20-foot-wide travel-way along the center line of structures, unless the terrain does not allow it. In the right-of-way, on approximately 9 miles on NFS lands, Ameren would blade the ground as needed to allow vehicles to drive between structures.

Improved Level One roads would be converted to Level Two (open to high clearance vehicles, seasonally closed for resource protection) status in the road system database. Those currently open to public use would continue to be open. Those routes that are not open for public use, or are not part of a public road system, would continue to be closed and gated for resource protection and control of access to the ROW. All routes approved for access, along with the ROW corridor, would be appropriately incorporated into the new permit and associated O&M Plan. The permit and O&M plan would also include oversight of these routes for future maintenance needs. The only access routes that would be allowed for future powerline ROW maintenance (mowing and vegetation control, pole and line maintenance) would be those included in this project access route analysis.

Some access routes would cross private land to reach the ROW corridor. Ameren would be responsible for obtaining the necessary rights-of-way or access permission from adjacent landowners.

Once the reconstruction of the powerline and its support structures is completed, Ameren would be responsible for site restoration. On public lands, Ameren would complete final grading and broadcast temporary (annual) seed and permanent (perennial) seed as soon as possible after the large disturbance activities are complete. Final seeding would include the preparation of a proper seedbed. The site would be tilled 2 to 4 inches in depth to obtain loose friable soil, and fertilized as needed. Rutted areas would be leveled, seeded with a USFS-approved seed mix, and mulched.

Land Use Authorization

The Forest Service is proposing to issue a new special use permit to Ameren Illinois Company that would authorize the continued use and occupancy of NFS lands administered by the SNF for the purpose of operating and maintaining approximately 9 miles of the Grand Tower–Makanda North line electric powerline right-of-way. An Operations and Maintenance plan that would be developed as part of the permit would contain specific terms and conditions for authorized activities in the ROW based on project design criteria. Design criteria will be identified from this analysis for addressing, among other things, concerns such as access route and ROW use and maintenance; Threatened, Endangered, and Sensitive species and habitat protection; heritage resources protection; erosion control measures for protecting soil, water, and wetlands; invasive species management; Forest Plan direction and standards and guidelines; and the timing of authorized activities. The special use permit would be issued under the authority granted by Federal Land Policy and Management Act, as amended October 21, 1976, to the applicant, Ameren Illinois Company, for a term of 20 years.

Alternatives Eliminated from Detailed Study

No other alternative activities were considered in detail during this phase of the analysis. The use of helicopters to transport in the support structures was considered, but dismissed. With helicopter transport, the amount of tree cutting would not be substantially reduced, since heavy equipment needed for the installation of the structures would still require the same basic level of access route reconstruction and improvements.

There were three responses received during scoping. All issues and concerns came from comments submitted by the State of Illinois Department of Natural Resources. No comments suggested led to development of another alternative.

Comparison of Alternatives

Table 1 summarizes the environmental effects of the two alternatives evaluated in detail in Chapter 3**.**

Table 1. Comparison of Alternatives

Alternative 1 No Action	Alternative 2 Proposed Action
Wildlife and Aquatic Resources, Including Threatened, Endangered and Sensitive Species	
As a result of ROW mowing, and maintenance of ROW and access routes: • Potential mortality to breeding individuals and nesting young of the year. • Reduction in the quality of grassland nest habitat. • Habitat conditions along the ROW would be largely unchanged; ROW would continue to provide little shrub nesting habitat. • Disturbance and mortality associated with continued use of roads that should be closed, and where unauthorized ATV use occurs. • Some existing routes on steep slopes are rutted and poorly drained, and are actively contributing sediment into watersheds, reducing water quality and adversely affect wildlife and aquatic species. • See Table 9 for effects determinations for all TES species. • No additional proposed project activities that would produce cumulative effects.	Effects would be associated with activities necessary to prepare the access routes for use such as tree cutting and road reconstruction, as well as installation of structures in the powerline corridor. NOTE: the same effects related to maintenance and mowing as displayed in the No Action alternative would apply under the Proposed Action. Overall effects summary: • Possible harm or mortality of wildlife when a tree is felled. • Mortality of less mobile species. • Disturbance to sensitive wildlife species. • Closing undesignated roads currently open would reduce potential impacts to wildlife. • Clearings for road construction would reduce mature forest habitat on approximately 13 acres of SNF. • Potential increase in predation/parasitism. • Possible mortality or avoidance (i.e. displacement) of wildlife during implementation. • Little change in stand level habitat from proposed clearings. A small reduction in mature forest. Clearings would create habitat for species that utilize small patches of early structural forest. • Because of small size of clearings, there would be no long-term adverse impacts from fragmentation. • Road grading and surfacing would result in modified or reduced, localized dispersal and movements of some species. • Existing erosion and poor drainage conditions would be corrected, resulting in improvement in water quality, and thus a positive impact to aquatic resources. • Proposed road closures would reduce disturbance to sensitive wildlife in Cedar Creek Bottom, Horseshoe Bluffs and Little Grand Canyon. • See Table 9 for effects determinations for all TES species. • No measureable increase in long-term adverse cumulative effects to wildlife.

Alternative 1 No Action	Alternative 2 Proposed Action
Access Routes and Transportation System	
• No direct effects. • The situation would continue where some existing routes on steep slopes are rutted and poorly drained, and actively contributing sediment into watersheds, thus reducing water quality and causing erosion. • Slight and continued decrease in health and safety due to the deteriorating powerline poles, including an increase in fire danger where low-hanging wires come close to the ground. • Light traffic over time would be expected to contribute to continued route deterioration on lower-standard routes not receiving scheduled maintenance. Higher standard system roads would continue to receive regularly scheduled maintenance. • No additional proposed project activities that would produce cumulative effects.	• Approximately 16 miles of access routes have been proposed for use and would most likely need some level of improvement. • Proposed activities would correct existing poor drainage and result in a more sustainable system that would reduce erosion. Positive short-term and long-term effects. • There would be a short-term increase in traffic and thus, a decrease in public health and safety during project implementation, minimized by use of the design criteria. • In the long-term, there would be an expected improvement in road conditions and thus, public health and safety, resulting in a more stable and better managed transportation network with minimal erosion and drainage problems. • Proper road management and use of appropriate road closures would minimize conflicts with public use and powerline management. • No adverse cumulative impacts.
Botany Including Threatened, Endangered and Sensitive Species	
• No direct or indirect adverse impacts. • On-going maintenance may benefit some of the species that could be growing along the ROW. • No additional proposed project activities that would produce cumulative effects.	• No impact to threatened Mead's milkweed; not found in any areas where activities are proposed. • Design criteria would protect two of the three species found in areas subject to the disturbance proposed, French's shootingstar (state-listed threatened) and climbing milkweed (state-listed threatened); no impacts. • Guadeloupe cucumber may be damaged in the short-term during implementation but its viability should continue in the long-term since it thrives in the openness of the ROW. • Finger dogshade and Wolf's spikerush may possibly be damaged or destroyed at one project location in Oakwood Bottoms, but were not found during floristic surveys at this one known location. Known from at least 7 other locations within the Oakwood Bottoms area but will not impacted at any of these sites. • Finger dogshade and Wolf's spikerush would likely re-populate their habitat and thus, there would be no adverse cumulative impacts. • On-going maintenance may benefit some of the species that could be growing along the ROW. • No negative impacts to the Little Grand Canyon/Horseshoe Bluff Ecological Area. • No adverse cumulative impacts.
Heritage and Cultural Resources	
• No earth-disturbing activities and thus no direct effects. • Powerline and access route maintenance could lead to additional recreation usage and an increased number of public users, and thus produce an indirect adverse effect. Surveys have identified five sites within the area of potential effects that may be indirectly affected.	• There are 19 archaeological sites recorded within or near the project area. • Of the 19 heritage resources inventoried, 9 are potentially eligible for inclusion on the NRHP. • One eligible site cannot be avoided during the planned project activities. An evaluation of the site against the NRHP criteria will be conducted. If the site does have the ability to contribute meaningful information about

Alternative 1 No Action	Alternative 2 Proposed Action
• No additional proposed project activities that would produce cumulative effects.	the prehistory of the area, further excavation would be necessary to protect the archaeological material from damage related to project activities. • As noted for No Action, five sites within the area of potential effects may be indirectly affected. • Design criteria and protective measures would result in no adverse cumulative effects to heritage resources.
Soil and Water Resources	
• No ground disturbance from the proposed activities, and thus no direct impacts. • Soils would continue to be impacted at the current level by on-going maintenance and use of the access roads and ROW. • Soil quality and productivity would be increased in the long-term as organic matter decomposes. • Soil compaction would most likely continue at its existing level. • There would be no measurable changes to water quality. • All existing poor drainage and erosion issues would continue to deteriorate until remedied. • No additional proposed project activities that would produce cumulative effects.	• Sediment delivery as a measure of water quality would be approximately 4 to 5 tons per acre. • Soil erosion potential would be highest on slopes greater than 10 percent. About 18 structures (power poles) that would be replaced lie on or adjacent to slopes greater than 10 percent grade. • Ground cover has kept erosion to about 4 to 5 tons per acre soil loss off the surface. • Most trails and roads already have compacted soils and would become more compactable during the fall, winter and spring near about 56 different structures, particularly those in or adjacent to hydric or highly compactable soils. • There would be a relatively small increase in soil stability impacts. • Heavily disturbed areas would potentially experience erosion and gullying. Direct effects in these heavily disturbed areas would include an increase in soil erosion and compaction, and possible sedimentation into gullies or streams. • Erosion, compaction, and sedimentation would decrease soil productivity by reducing the surface soil horizon. • Design criteria would minimize impacts in heavily disturbed areas. • Potentially, a decrease in water quality in the ROW could result due to any increase in sediment delivery into the ROW. Design criteria would minimize impacts. • The overall cumulative impact to soil and water resources would be minimal.

Chapter 3 – Affected Environment And Environmental Consequences

This chapter describes the physical, social, biological, and health and safety conditions that might be affected by implementation of the alternatives. The chapter is organized by resource area. As directed by CEQ's implementing regulations for the National Environmental Policy Act, the disclosure of direct, indirect, and cumulative environmental effects, or impacts, focuses on resource conditions associated with the key issues and forms the scientific and analytical basis for comparing alternatives.

Direct effects are caused by the proposed activities and occur at the same time and place. Indirect effects are caused by proposed activities and occur later in time or are further removed in distance. Cumulative effects result from the incremental effects of proposed activities when added to other past, present and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions.

This analysis is tiered to the programmatic Final Environmental Impact Statement (FEIS) for the 2006 Forest Plan (Project Record 7.A.c and 7.A.d) and incorporates by reference the programmatic biological assessment and U.S. Fish and Wildlife Service Biological Opinion of the Plan (Project Record 7.A.g). The Service issued the biological opinion with restrictions to ensure that Forest Plan implementation would not likely affect federally listed species.

The chapter begins with a general description of the overall existing condition ("affected environment") for the project area. This is followed by each of the resource sections that include disclosure of the potential direct, indirect, and cumulative effects for each alternative. Note that the first section, Wildlife and Aquatic Resources, contains an in-depth description of the existing condition, or affected environment that supplements the general affected environment description.

For each resource, relevant key issues (see Chapter 1, Public Issues) are stated. These issues were identified through the public scoping process and the Forest Service review process and will be used to guide disclosure of impacts. For some resources, there may no key issues. Discussion of impacts in that case is framed by the resource concerns identified by the resource specialist.

The relevant resources that have effects disclosed in detail in this focused preliminary EA for public comment have been summarized from specialist reports located in the project record. They include:

- Wildlife and Aquatic Resources, Including Threatened, Endangered and Sensitive Species
- Access Routes and Transportation System
- Botany Including Threatened, Endangered and Sensitive Species
- Heritage and Cultural Resources
- Soil and Water Resources

A detailed effects disclosure for resources that have no or minimal impact is not included in this focused preliminary EA, but is provided in specialist reports and other pertinent documents found in the project record. These resources include General Recreation, Visual Resources and Visual Quality, and any Special Areas such as Wilderness, National Recreation Areas, and Natural Areas.

General Affected Environment for the Project Area

Although FS resource specialists may need to use different analysis areas (different acreages) to effectively determine and disclose impacts relevant to their resources, the project area may be thought of as the Grand Tower–Makanda North electric powerline right-of-way as it lies on NFS lands, and adjacent NFS and private

lands impacted by the proposed action. Those adjacent lands would mainly be impacted by work needed to prepare the access routes. The project area includes portions of the Even-aged Hardwood Forest, Oakwood Bottoms Greentree Reservoir, Mississippi and Ohio Floodplain, Candidate Wild and Scenic River, Natural Area, Mature Hardwood Forest, Cave Valley and Heritage Resource Significant Site management areas (MAs).

The project area has been and continues to be a well-disturbed site when considering above ground and sub-surface disturbance. Approximately 9 miles of the powerline ROW lies on NFS lands. The powerline corridor has been maintained in a brushy, scrubby, and grassy state. The surrounding area consists of a mix of vegetation including forested areas, occasional natural openings and shrub habitat, riparian areas, and farmland.

The forest areas are dominated by upland and bottomland oak species. There are also non-oak hardwood species, pine and riparian forest. There is also a small amount of openings and shrub habitat. Forest stand structure consists primarily of mature (50 years old and older) trees with very little young-aged (0 to 20 years old) forest habitat. A wide variety of wildlife can be expected to be present including Indiana bats and other bat species; bald eagles; a number of bird species; timber rattlesnakes and other snakes; various waterfowl and wetland birds; reptiles and amphibians; and small mammals such as beaver, muskrat, mink, river otter, gray squirrel, red and gray fox, deer mice, the Eastern woodrat, and the rice rat. Deer may also be found in various areas.

The powerline ROW is accessed by a variety of roads and trails that cross NFS and private lands. Most of the access routes are located in hardwood forests and consist of dirt, gravel, or crushed limestone surfaces. Portions of the county roads are either oil and chip or gravel. There are a variety of soil types in the project area including silt loams, silty clays, and clay loam. There are both hydric and non-hydric soils, rocky outcrops and cliffs. There are floodplains and prime farmland designated areas, as well as wetlands in the Oakwood Bottoms area. Soil erosion potential is generally high on soils with slopes greater than 10 percent and soil compaction potential is very high for nearly every soil mapping unit in the project area.

Wildlife and Aquatic Resources Analysis

The discussion that follows describing the affected environment and disclosing the environmental effects for wildlife and aquatic resources, including those that are proposed or listed under the Endangered Species Act, has been summarized from the Wildlife Specialist Report and Biological Evaluation found in the project record (Reitz 2014b).

The wildlife analysis discloses effects of the proposed activities on terrestrial and aquatic animal species. It describes site specific habitat conditions and evaluates effects to the following species that are known or likely to occur within the project area:

- Management Indicator Species (MIS) identified in the Shawnee National Forest Land and Resource Management Plan (Forest Plan) (USDA FS 2006).
- Federally threatened, endangered, proposed and candidate species.
- Regionally Sensitive Species (Sensitive) (USDA FS 2012a).
- Forest Plan species with viability evaluation (USDA FS 2006) and
- Illinois State-listed species

Affected Environment

The affected environment section below expands upon what was described above under the General Affected Environment for the Project Area section. Together, this provides a thorough understanding of the affected environment and existing condition that applies to the discussion of wildlife and aquatic resources that follows next, and also access routes and transportation system, botany, heritage resources, and soil and water resources.

The project area includes portions of the Even-aged Hardwood Forest, Oakwood Bottoms Greentree Reservoir, Mississippi and Ohio Floodplain, Candidate Wild and Scenic River, Natural Area, Mature Hardwood Forest, Cave Valley and Heritage Resource Significant Site management areas as described in the Forest Plan. Proposed road and transmission lines that traverse these management areas (Mas) are summarized in Table 2 below. The Wildlife Specialist Report also identifies important MA standards and guidelines that pertain to the proposed action and the wildlife resource.

Table 2. Proposed action management areas[5]

Management Area	Miles				
	Major Line[1]	Minor Line[2]	Road Reconstruction[3]	Road Maintenance[4]	Total
Even-aged Hardwood Forest	1.4	1.0	2.3	1.8	6.5
Oakwood Bottoms Greentree Reservoir	0	1.5	1.6	1.2	4.3
Mississippi and Ohio River Floodplain	0	0.5	1.1	0	1.6
Candidate Wild and Scenic River	0.7	0.6	0.2	0	1.5
Mature Hardwood Forest	0.9	0	2.3	1.5	4.7
Cave Valley Bird Area	1.7	0.8	1.4	1.1	5.0
Heritage Resource Significant Site	0	0.5	2.1	0	2.6
Total Miles by Activity	**4.7**	**4.9**	**11.0**	**5.6**	**26.2**

1 – Pole replacement may require more work (e.g. install dead end structures).
2 – Includes minimal work related to pole replacement.
3 – Roads will require major work and a larger number of trees to be removed.
4 – Minor roads require minimal work and some tree removal.
5 – Miles of activity are displayed for all ownerships.

For the wildlife discussion, the analysis area includes all NFS lands affected by the proposed action and all lands within one-quarter mile of proposed powerline and access roads. This area totals approximately 6,637 acres and was selected because it includes all proposed actions and adjacent habitats that may influence wildlife use. This area is also large enough to assess, as needed, fragmentation related effects.

For the purpose of analysis, the wildlife project area was broken down into four distinct analysis areas including Fountain Bluff (Figure 3), Big Muddy (Figure 4), Cedar Creek (Figure 5) and Cave Creek (Figure 6). These areas were separated out because they generally have different habitat/landscape conditions and with the exception for some overlap between the Cave and Cedar Creek areas, occur in different watersheds. The wildlife analysis area is displayed in Figure 2, whereas a summary of the habitat conditions and management are displayed in Table 3.

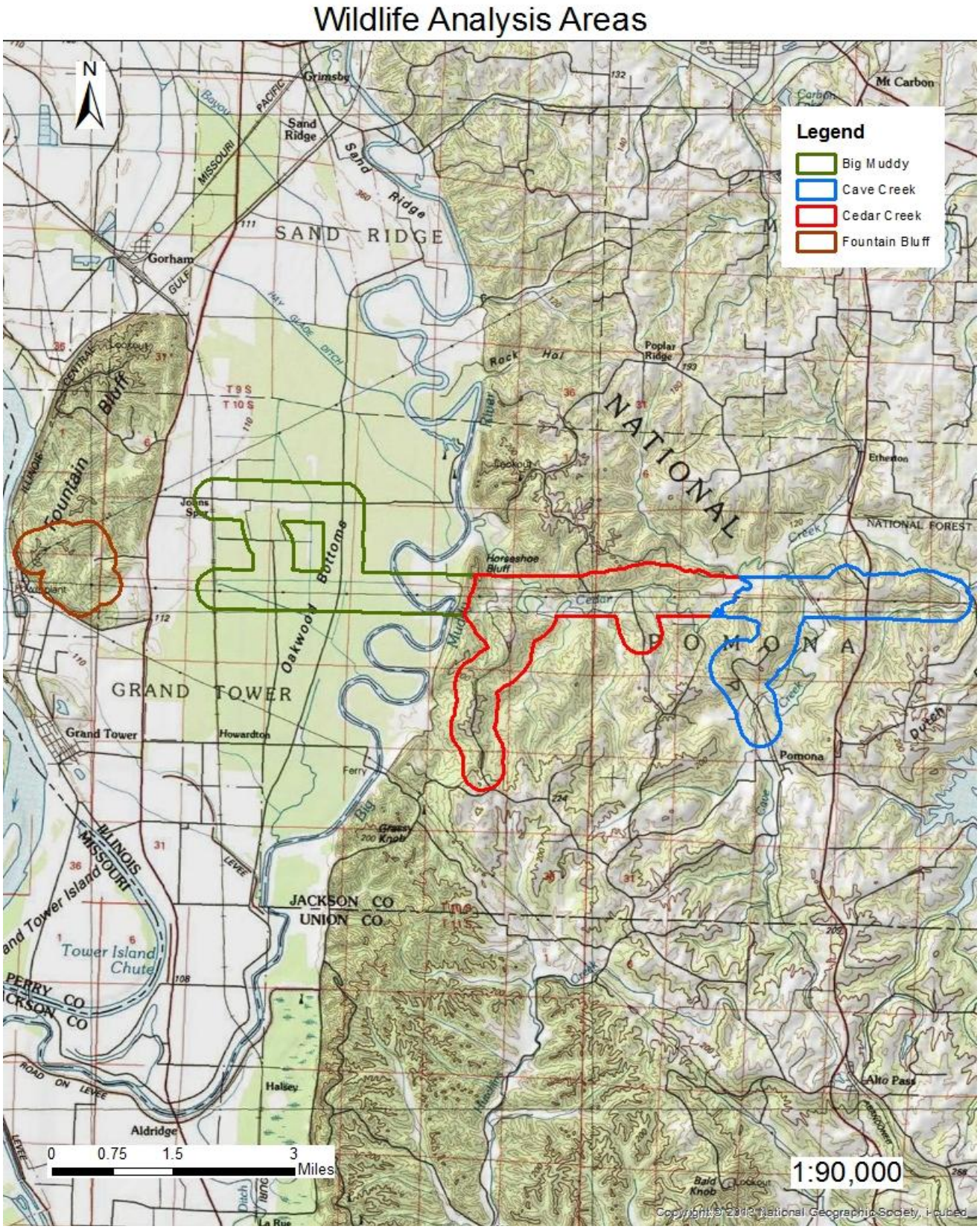

Figure 2. Wildlife analysis areas

Table 3. Project area management emphasis and habitat conditions by the four analysis areas

Management/Habitat	Fountain Bluff	Big Muddy	Cedar Creek	Cave Creek	Total
Ownership Acres					
National Forest	444	1,977	1,984	1,186	5,591
Private	252	145	160	489	1046
Total	*696*	*2,122*	*2,144*	*1,675*	*6,637*
Plan Management Area Acres					
Even-age Hardwood Forest	0	0	1,153	611	1,764
Oakwood Bottoms	0	1,325	0	0	1,325
Mississippi River Floodplain	52	427	0	0	479
Cave Valley Bird Area	0	0	536	486	1,022
Wild and Scenic Area	0	337	42	0	379
Mature Hardwood Forest	0	0	368	569	937
Natural Area	0	33	43	11	87
Heritage Significant Site	644	0	0	0	644
Total	*696*	*2,122*	*2,142*	*1,677*	*6,637*
Cover Type Acres[1]					
Oak	402	1,076	1,239	761	3,478
Non-Oak	20	198	178	154	550
Pine	0	0	98	99	197
Riparian Forest	0	356	366	96	818
Forest Total	422	1,630	1,881	1110	5,043
Openings	23	346	82	34	485
Upland Shrub	0	0	19	42	61
Non-Forest Total	*23*	*346*	*101*	*76*	*546*
Forest Structure Acres[1]					
Seedling (0-10 yrs.)	0	54	0	0	54
Sapling (11-20 yrs)	0	0	5	0	5
Pole (21-49 yrs.)	20	216	387	66	689
Mature (50+ yrs.)	402	1,360	1,489	1,044	4,295
Total	*422*	*1,630*	*1,881*	*1,110*	*5,043*
Stream/Wetland[2]					
Emergent Wetland Ac.	0	127	12	5	144
Forest Wetland Ac.	0	1,695	308	191	2,194
Riverine Ac.	0	24	0	0	24
Lake/Pond Ac.	0	30	3	<1	33
Total Wetland Acres		1,876	323	196	2,395
Floodplain	13 (<1)	293 (14)	706 (33)	375 (22)	1,387 (21)
Stream Miles	2.0	0	10.0	6.5	18.5
River Miles	0	1.3	0	0	1.3
Channel/Ditch Miles	0	10.1	0	0	10.1
Total Miles	*2.0*	*11.4*	*10.0*	*6.5*	*29.9*
Roads					
Road Miles (Density mi/mi^2)	2.4 (2.2)	7.6 (2.3)	9.8 (3.0)	8.3 (3.2)	28.1 (2.7)

1 – NFS land only 2 – National Wetland Inventory (NWI) wetlands

The following is a description of the four wildlife analysis areas as noted above.

Fountain Bluff

The Fountain Bluff analysis area is displayed in Figure 3 and except for a small amount of land that falls within the Ohio/Mississippi River floodplain management area, all of Fountain Bluff falls within the Heritage Significant Site MA. Approximately two thirds of the area occurs on NFS land, with private land inclusions to the west, south and east. The area is largely upland habitat with no wetlands and NFS lands are almost entirely mature oak forest. Due to its proximity to steep bluffs along the Mississippi River, the area contains rock, talus and timber rattlesnake den habitat. While a small amount of perennial stream occurs to the west, streams are largely intermittent headwaters and this is the only wildlife analysis area that lacks riparian forest. Except for openings associated with existing powerlines and agriculture/developed land around the perimeter, there is little open habitat.

Most of the road work occurs on the plateau. There is approximately 0.2 miles of road reconstruction on a moderately steep southeast facing slope coming up from the bottom. This section of road is heavily rutted, has little surfacing and is currently a source of sediment. Much of the plateau is fairly narrow and would involve removal of a number of suitable roost trees for Indiana bats and northern long-eared bat. Tree removal includes scattered individual trees along the road and approximately 4.7 acres of clearing on 11 sites at road corners. Current access to the ROW for maintenance is good, although it does not appear that this section of ROW was mowed every other year (current mowing cycle) as is indicated by the 3- to 4-foot-high woody vegetation present on much of the ROW.

In addition to providing important summer bat habitat, the rock outcropping/bluffs in this area provides historic and existing rattlesnake dens and timber rattlesnakes are commonly observed in the area. While a woody understory and foraging habitat exists within affected stands, the ROW provides the only early successional and non-forest component in this area. As a result, it provides both foraging and basking habitat. Mississippi green water snake, flathead snake, bird-voiced tree frog and cerulean warbler have also been documented in this area. The area provides habitat for the Eastern woodrat and lands north of this portion of the project area served as a release site in 2006.

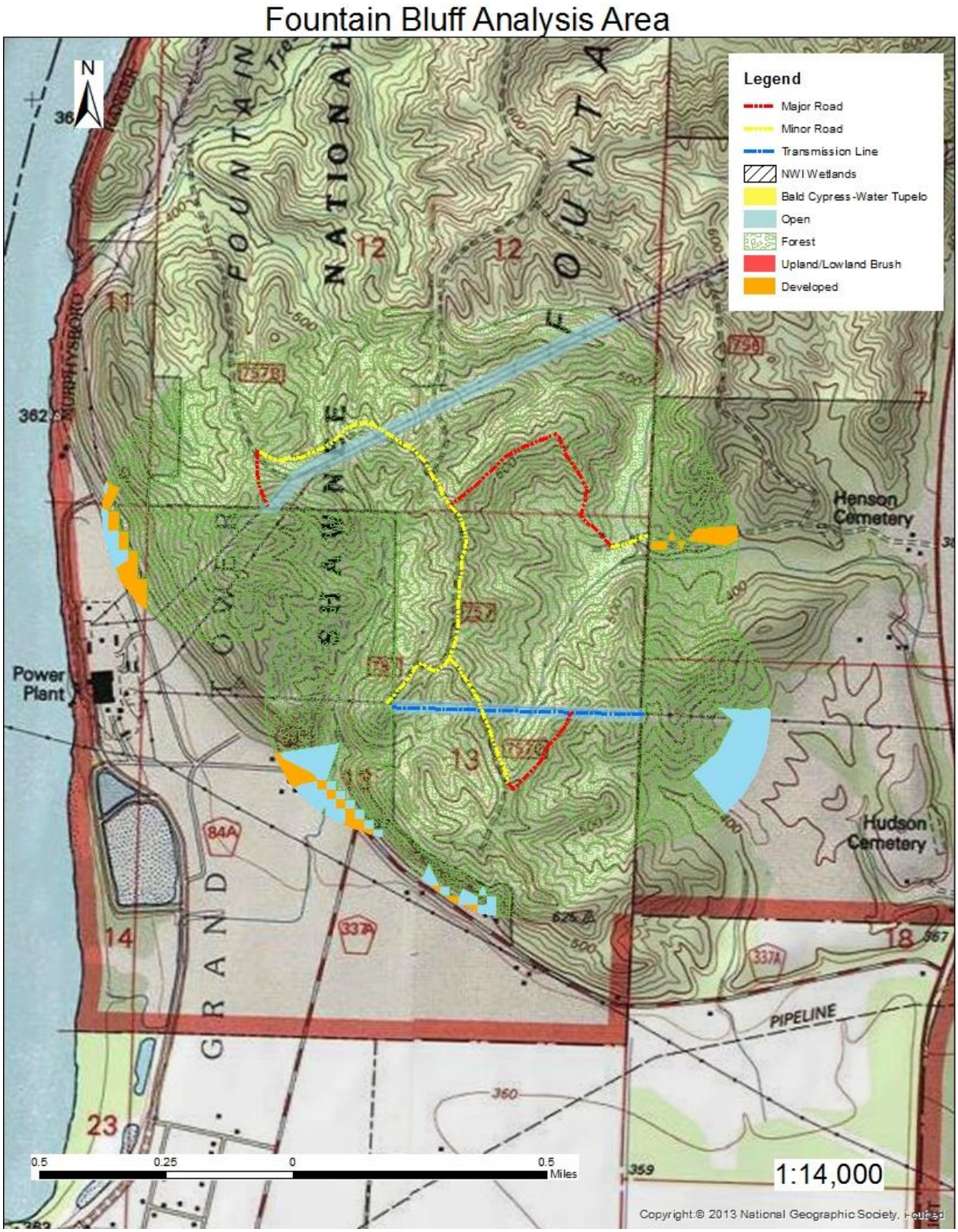

Figure 3. Fountain Bluff analysis area

Big Muddy

This Big Muddy analysis area (Figure 4) includes the Big Muddy River and Oakwood Bottoms from State Route 3 on the west to Horseshoe Bluffs on the east. Lands west of the levee (which includes about 1.5 miles of ROW and almost all of the road work) are part of the Greentree Reservoir MA, which is inundated with water for much of the year. East of the levee, approximately 0.50 mile of ROW traverses MA 6.2 (Mississippi and Ohio River floodplains), whereas lands closest to the Big Muddy are included in the Candidate Wild and Scenic River MA.

Over 1,800 acres or 88 percent of the Big Muddy analysis area occur as forested wetlands (Table 3). The area contains approximately 1.3 miles of river (Big Muddy) and 30 acres of open water. There are over 10 miles of man-made channels and ditches which are used to flood the area and create the Greentree Reservoir complex. Most of the Greentree Reservoir MA contains mature swamp chestnut/cherry bark and pin oak, interspersed with pole sized red maple and ash stands. This area is also characterized by numerous openings, levees and ditches interspersed with forest. This area has a high concentration of potential Indiana bat maternity roosts (including a number of known roosts) because of the bottomland conditions, sawtimber component, and large snag tree density. While snag density on lands east of the levee is high, this area has fewer large-diameter snag trees.

While the levee between the Oakwood Bottoms and Mississippi River floodplain MA is identified as requiring major work, few trees would be removed. However, some tree removal would be needed at road corners along the Big Muddy access road and along NFS Road 758. It is estimated that approximately 0.9 acres of clearing would be necessary at five road curves/corners. Also, some scattered individual tree removal may be necessary along portions of the road. While some of the lands immediately below the powerline in the ROW are mowed, woody vegetation is being maintained along much of the ROW.

The area between the bottomland and Greentree Reservoir provides unique habitat conditions including emergent, open water, shrub/forested wetlands, bottomland hardwoods, standing water and openings. It provides important waterfowl migration, stopover and breeding habitat, amphibian upland and breeding habitat, and habitat for a variety of cavity nesting species. It is within 5 miles of an Indiana bat hibernacula and provides swarming habitat, as well as one of the largest Indiana bat maternity colonies in the state. Indiana bats have also been documented along the ROW. Timber rattlesnake habitat occurs in Horseshoe Bluffs along the eastern boundary, as well as on adjacent lands. Timber rattlesnakes are common within Oakwood Bottoms during late spring, summer, and early fall months. Horseshoe Bluffs and rock habitat to the east (Cedar Creek area) contains a remnant Eastern woodrat population and suitable habitat occurs on and adjacent to the ROW.

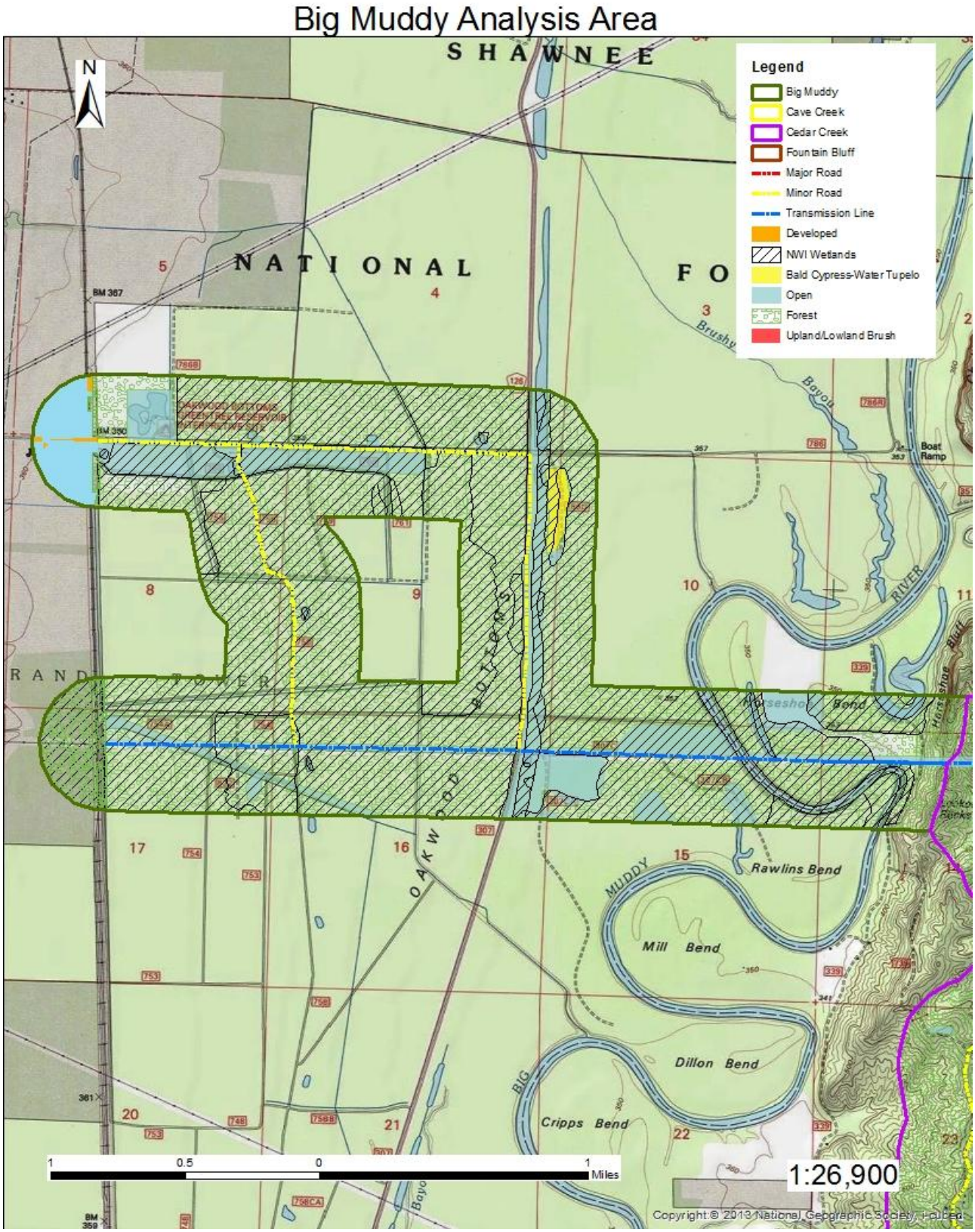

Figure 4. Big Muddy analysis area

Cedar Creek

Most of this Cedar Creek analysis area is included in the Even-aged Hardwood Forest and Mature Hardwood Forest management areas, although it also contains over 500 acres of the Cave Valley Bird MA and smaller amounts of the Wild and Scenic River and Natural Area MAs. On the west, the powerline runs across bluffs above the Big Muddy River and lookout rocks. The powerline also runs within 50 feet of the Little Grand Canyon-Horseshoe Bluffs natural area for approximately 0.4 miles. The remainder of the line runs through the Cedar Creek Bottom for approximately 3 miles, which contains over 300 acres of forested wetland (Figure 5). As with the other areas, individual tree removal would occur along road corridors. Approximately 5.4 acres of clearing would be necessary at over 20 road corners/curves.

There are two access points to this wildlife analysis area including NFS Road 752 (Bolton Camp Hollow) on the west and NFS Road 750 (Natural Bridge Road)/NFS Road 742 to the east. The following is a brief discussion of each; more details may be found in the Wildlife Specialist Report.

Horseshoe Bluffs/Bolton Camp Hollow (FR 752)

The western section is accessed through Bolton Camp Hollow via NFS Road 752. Approximately a third of this section of ROW traverses upland with rock/karst, whereas most of it runs along the Cedar Creek bottom. There is also an abundance of forested wetlands where NFS Road 752 intersects with the ROW. Some sections of NFS Road 752 would have minor work and some would have major work, including tree removal (Figure 5). Some steep sections of NFS Road 752 are deeply rutted and severely eroding, and thus, actively contribute sediment into Cedar Creek. As a result, some steep sections of this road may have to be moved a small distance outside the existing road corridor.

This area is predominantly oak, with a large white oak component. Red maple and elm are minor stand components. While mature forest predominates, there are a mix of regeneration and pole timber, including some larger diameter trees along the road corridors. There is unauthorized ATV use in Bolton Camp Hollow and several ATV corridors are found along NFS Road 806. Based on the amount of clearing that has already taken place along the road corridor, it is likely Ameren has been using NFS Road 806 for ROW maintenance. The section of powerline in close proximity to Horseshoe Bluff provides rattlesnake foraging and basking habitat. Approximately 500 acres within the project area are considered occupied habitat by the Eastern woodrat. As it drops into Cedar Creek, the floodplain wetland habitat along the powerline provides habitat for Swainson's and cerulean warblers, which have been documented throughout this area.

Natural Bridge Road FR 750/742, FR 741/346

National Forest System roads 750/742 are scheduled for light work, are fairly straight and would require removal of few trees. The habitat includes mature oak, young northern hardwoods/maple and a small shortleaf pine stand. This access route is the western-most portion of Cave Valley Bird Area (MA 6.5) and due to the existing floodplain/wetland conditions, this area provides important bird habitat. Swainson's warbler, cerulean warbler, timber rattlesnake and Indiana bat (maternity roost) have all been documented within 0.25 mile of the junction of NFS Road 741 and NFS Road 346, as well as along the Cedar Creek bottom.

Much of the ROW is accessed via NFS Road 741, of which portions are badly rutted and in poor condition. The entire road appears to be actively contributing sediment into Cedar Creek. The access route traverses the Cedar Creek floodplain. While floodplain predominates, there are also rock/karst and a young stand which will require a little roost tree removal.

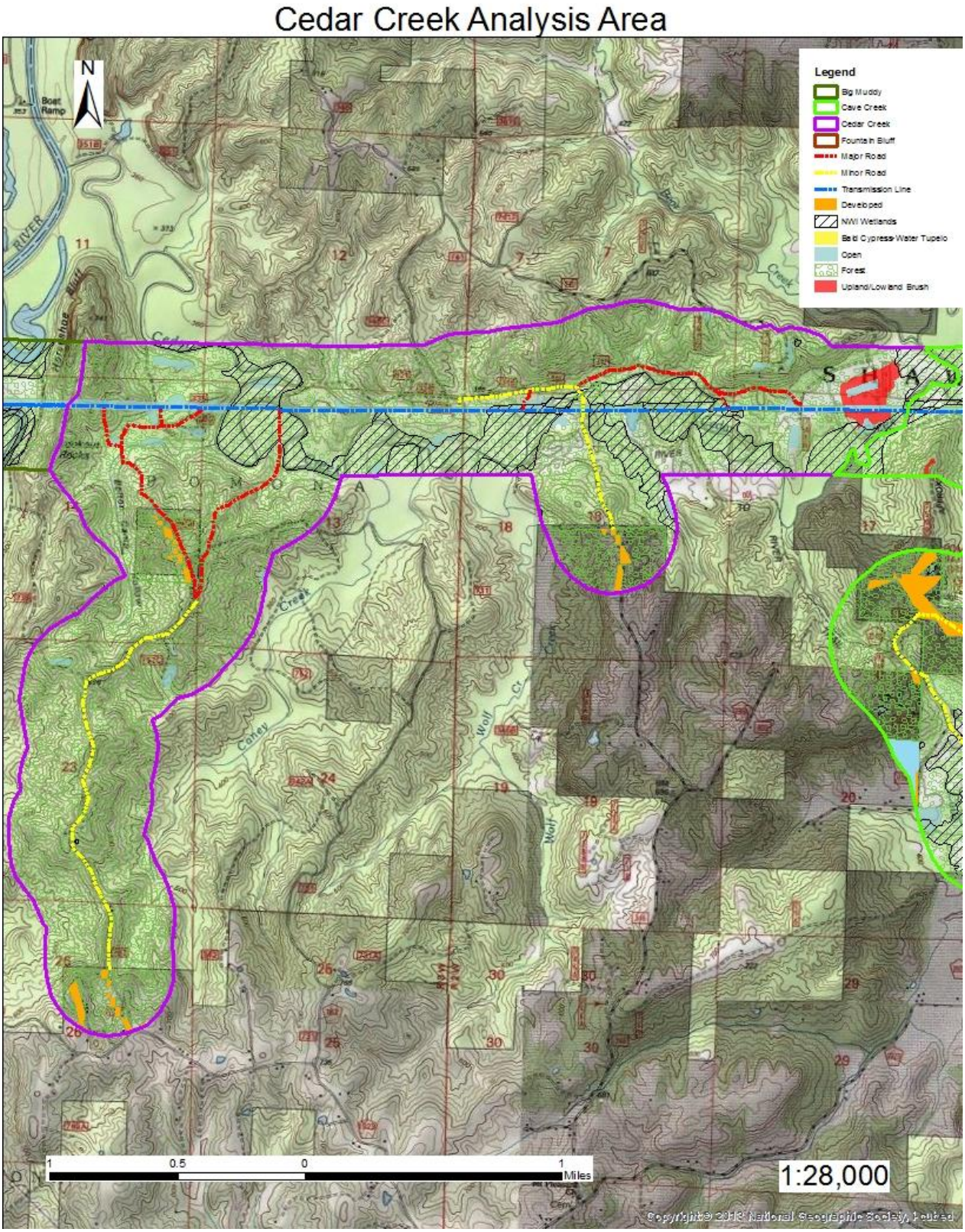

Figure 5. Cedar Creek analysis area

Cave Creek

Cave Creek analysis area is displayed in Figure 6. While the western-most portion of this area traverses floodplain, most of it occurs on uplands. Like the Cedar Creek area, it contains approximately 500 acres of the Cave Valley Bird MA, but contains more rock/karst and consequently a higher density of suitable rattlesnake denning habitat.

This section has three access points including (1) NFS Road 743 (western-most), (2) State Highway 127 and lands to the west, and (3) State Highway 127 and lands to the east. In addition to scattered individual tree removal along the road corridor, a total of approximately 1.7 acres of tree clearing may be necessary at nine sites. The following is a brief discussion of the three access points.

National Forest System Road 743 Access

National Forest System Road 743 occurs on the plateau top and is fairly open requiring little tree removal. The route corridor contains some oak, and a mix of pine and hardwoods which traverses the Mature Hardwood Forest MA. It appears this section of ROW is likely mowed every other year.

National Forest System Road 743a traverses a mixed-oak stand with some larger diameter roost trees, and contains a large rock outcropping. The ROW west of NFS Road 473a runs into the Cedar Creek bottom and is part of the Cave Valley Bird Area (eastern edge). There is a portion of the ROW that adjoins a large forested wetland and provides excellent Swainson's warbler habitat.

Right of Way West of State Road 127

This right-of-way access includes a narrow section of road with a fair amount of large rocks and outcroppings. Dozens of rattlesnakes have been observed on this section of ROW in the spring of the year. Cerulean warblers have also been observed near this area. There is a short spur that parallels the ROW between the two access points that would require some roost tree removal. Because of the proximity of existing rattlesnake dens, southern exposure and rock outcroppings, there is a high level of rattlesnake use in this portion of the project area.

Right of Way East of State Road 127

This right-of-way access comes off of private land and traverses a mowed field on private land for the first 0.25 mile. Once it enters the National Forest, it is dominated by shrubs/early successional forest, although the last 0.25 mile runs through mature mixed-oak forest. There would be little roost tree removal along this spur, or the primary access road. One section of powerline has not been maintained annually and 3- to 4-foot-high woody vegetation has become established. Because of the proximity to rock outcroppings and rattlesnake dens, south facing aspect and abundance of early successional foraging habitat, use of this section of ROW by snakes is likely to be high.

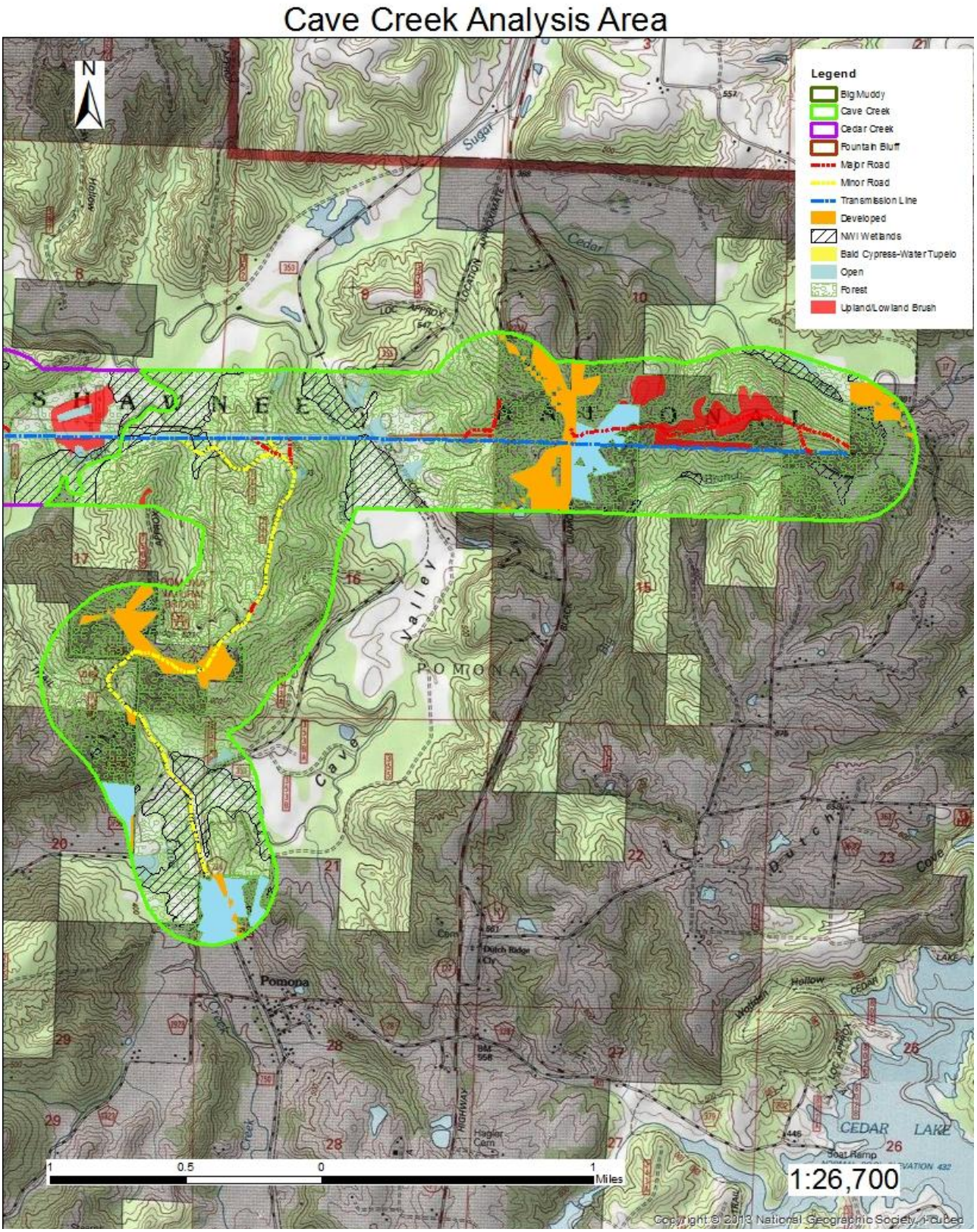

Figure 6. Cave Creek analysis area

Affected Environment for Individual Species

The Wildlife Specialist Report and Biological Evaluation describe in detail the affected environment for all wildlife and aquatic species potentially affected by the proposed action. This level of detail will not be repeated here, and the report is in the project record. It includes details on the status, life history requirements, threats, and project area habitat for federally threatened, endangered, and sensitive species; Illinois State listed species; Forest species with viability evaluation; and MIS.

Effects Analysis

Four unresolved key issues were identified during project scoping relating to wildlife resources.

- There is concern that the proposed activities could adversely affect endangered or threatened bats.
- There is concern that the proposed activities could adversely affect the state-listed threatened Timber Rattlesnake.
- There is concern that the proposed activities could adversely affect the state-listed endangered Eastern woodrat and the state-listed rice rat.
- There is concern that the proposed activities could adversely affect migratory birds, including State-listed threatened and endangered species.

The effects discussion as presented next is species driven. As such, the following indicators were used to frame the analysis of wildlife effects on various species.

Table 4. Issue indicators used to measure wildlife effects

Species	Wildlife Effect Indicator
Management Indicator Species	
Yellow-breasted chat[2]	Effects to individuals, shrub openings and young regenerating forest
Worm-eating warbler[2]	Effects to individuals and mature upland forest
Scarlet tanager	Effects to individuals and upland and bottomland mature hardwood forest.
Woodthrush[2]	Effects to individuals and mature bottomland hardwoods with a woody understory
Northern Bobwhite[2]	Effects to individuals and changes in woodland grassland habitat.
Threatened, Endangered and Proposed Species	
Gray bat[3]	Effects to individuals, hibernacula, and roosting, foraging, swarming habitat.
Indiana bat[3]	
Northern long-eared (NLE) bat	
Least tern	Effects to individuals and riverine habitat.
Sensitive Species	
Rafinesque's big-eared bat[3]	Effects to individuals, potential hibernacula, and roosting and foraging habitat.
Southeastern myotis	
Eastern small-footed bat	
Tri-colored bat	
Little brown myotis	
Eastern woodrat[3]	Effects to individuals, ravines and forested floodplain habitat.
Cerulean warbler[3]	Effects to individuals and suitable mature forest habitat
Henslow's sparrow	Effects to individuals and suitable open land habitat.
Migrant loggerhead shrike	Effects to individuals and shrub habitats.
Bald eagle	Effects to individuals, suitable river and open water habitat.

Species	Wildlife Effect Indicator
Swainson's warbler[3]	Effects to individuals and closed canopy bottomland habitat with a developing understory
Timber rattlesnake[3]	Effects to individuals and suitable den and foraging habitat
Alligator snapping turtle	Effects to individuals and slow moving stream and riverine habitat.
Mississippi green watersnake	Effects to individuals and suitable bald cypress/water tupelo backwater habitat.
Bird-voiced treefrog[3]	
Flat-headed snake	Effects to individuals and rocky pine/hardwood habitat.
Eastern narrow mouth toad[3]	Effects to individuals and open wetland and riparian habitat
Subtle Cave amphipod (*Stygobromus sbutilis*)	Effects to individuals and spring/seep habitat in karst areas.
Forest species with viability evaluation[1]	
River otter	Effects to individuals and suitable river/stream and open water habitat
American woodcock	Effects to individuals, shrub openings and young regenerating forest
Northern bobwhite	
Yellow-breasted chat	
Worm eating warbler	Effects to individuals and mature hardwood/riparian habitat
Wood thrush	
Red-headed woodpecker	Effects to individuals and open woodland and snag habitat
Gray treefrog	Effects to individuals and forested riparian/wetland habitat.
Illinois State Listed Species Not Previously Listed[1]	
Rice rat	Effects to individuals and wetland habitat.
Golden mouse	Effects to individuals and open woodlands/swamps.
Mississippi Kite	Effects to individuals and suitable mature forest bottomland habitat.
Loggerhead shrike	Effects to individuals and open lands with a shrub component.
Smooth softshell	Effects to individuals and stream/river habitat

1 – Not previously listed as a TES or MIS species.
2 – Also a Forest species with viability evaluation
3 – Also listed as an Illinois State listed species

Scale of Analysis and Species Considered

The project boundary (approximately 6,637 acres) was selected for analysis of direct and indirect effects on wildlife because it includes all proposed actions and adjacent habitats that may influence wildlife use. A total of 64 species including T&E, Regionally sensitive, Forest species with viability evaluation, state listed species and MIS were considered. Due to the lack of suitable habitat or recent documentation, 1 T&E, 21 sensitive species and 6 state listed species were eliminated from detailed analysis. Listing of these species may be found in the project record.

Table 5 lists the federally threatened and endangered species and regionally sensitive species that were evaluated in detail. Illinois State listed and Forest species with viability evaluation are displayed in Table 6 and Forest MIS species considered are displayed in Table 7.

Table 5. Federally threatened and endangered and regionally sensitive species evaluated

Common Name	Scientific Name	Documented	Not Recently Documented Suitable Habitat Present
Threatened and Endangered Species[1]			
Indiana bat[2]	*Myotis Sodalis*	X	
Gray bat[2]	*Myotis grisescens*	X	
Northern long-eared bat[1]	*Myotis septentrionalis*	X	
Least tern	*Sterna antillarum*		X
Sensitive Species			
Rafinesque's big-eared bat[2]	*Corynorhinus rafinesquii*	X	
Southeastern myotis	*Myotis austroriparius*		X
Eastern small-footed myotis	*Myotis leibii*		X
Northern long-eared bat	*Myotis septentrionalis*	X	
Tri-colored bat	*Perimyotis subflavus*	X	
Little brown myotis	*Myotis lucifugus*	X	
Eastern woodrat[2]	*Neotoma floridana*	X	
Henslow's sparrow	*Ammodramus henslowii*	X	
Cerulean warbler[2]	*Dendroica cerulean*	X	
Bald eagle	*Haliaeetus leucocephalus*	X	
Migrant loggerhead shrike	*Lanius ludovicianus migrans*	X	
Swainson's warbler[2]	*Limnothylpis swainsonii*	X	
Timber rattlesnake[2]	*Crotalus horridus*	X	
Alligator snapping turtle	*Macrochelys temminckii*	X	
Mississippi green watersnake	*Nerodia cyclopion*	X	
Flat-headed snake	*Tantilla gracilis*		X
Eastern narrow-mouth toad[2]	*Gastrophryne carolinensis*		X
Bird-voiced treefrog[2]	*Hyla avivoca*	X	
Subtle Stygobromid	*Stygobromus subtilis*		X

1 – Species proposed for federal listing are evaluated as a Forest sensitive species. 2 – Illinois state listed species

Illinois State Listed Species and Forest Species with Viability Evaluation

A total of 20 state listed (threatened or endangered) species have been documented from Jackson County Illinois (Illinois DNR 2013b). The project area is either outside the current range, or no occurrences have been documented from project area watersheds for six species including the common moorhen, least bittern, barn owl, big-eye shiner, sturgeon chub, and western sand darter (Illinois Natural Heritage GIS data 2013) (Table 9). Fourteen species either have been documented within the project area or have suitable habitat present (Illinois Natural Heritage 2013a, Illinois GAP 2013) and these species could be affected by the proposed action. Of these, nine species including the Indiana bat, gray bat, Rafinesque big-eared bat, eastern woodrat, Swainson's warbler, cerulean warbler, timber rattlesnake, eastern narrow-mouthed toad and bird-voiced treefrog are listed in Table 5 as threatened, endangered or regionally sensitive. Project area status of the remaining five state listed species is displayed in Table 6. Table 6 also identifies Shawnee National Forest species with viability evaluation (USDA FS 2006a). Species specific analysis is provided for all state listed species potentially affected in the Wildlife Specialist Report and Biological Evaluation.

Table 6. Illinois state listed species and forest species with viability evaluation

Common Name	Scientific Name	Documented	Not Recently Documented Suitable Habitat Present
Illinois State Listed Species			
Marsh Rice Rat	*Oryzomys palustris*	X	
Golden Mouse	*Ochrotomys nuttalli*		X
Mississippi Kite	*Ictinia mississippiensis*	X	
Loggerhead Shrike	*Lanius ludovicianus*	X	
Smooth softshell	*Apalone mutica*	X	
Forest Species with Viability Evaluation			
River otter	*Lutra canadensis*	X	
American woodcock	*Scolopax minor*	X	
Northern bobwhite	*Colinus virginianus*	X	
Red-headed woodpecker	*Melanerpes erythrocephalus*	X	
Wood thrush	*Hylocichla mustelina*	X	
Worm eating warbler	*Helmitheros vermivorum*	X	
Yellow-breasted chat	*Icteria virens*	X	
Gray treefrog	*Hyla versicolor*	X	

Management Indicator Species

Table 7 displays MIS species evaluated and the habitats they represent, available project area habitat and when available, population trend information. More detailed species-specific information is provided in the Wildlife Specialist Report available in the project record. Additionally, the selection and rationale for these species is located on pages 3-194 to 3-195 of the Forest Plan FEIS and preferred habitat, threats, and management emphasis are discussed on pages 3-196 to 3-204 of the Forest Plan FEIS (USDA-FS 2006b).

Table 7. Forest management indicator species evaluated

Species	Scientific Name	Population Trend[1]	Habitat
Yellow-breasted chat[2]	*Icteria virens*	-1.6	Represents species of shrublands: Herbaceous openings and upland hardwood and pine to nine years old
Worm-eating warbler	*Helmitheros vermivorum*	2.7	Representing ground-nesting species: Upland hardwood more than 50 years old
Scarlet tanager	*Piranga olivacea*	0.4	Representing canopy-nesting species: Upland and bottomland hardwood more than 50 years old
Woodthrush[2]	*Hylocichla mustelina*	-1.6	Representing species that nest in shrubs and small trees: Bottomland hardwood more than 50 years old (riparian areas and filter strips, and wild and scenic river corridors) and upland hardwood more than 50 years old.
Northern Bobwhite[2]	*Colinus virginianus*	-3.7	Representing species of grasslands, shrublands and edges: Wildlife and herbaceous openings, regeneration areas

1 – State-wide trend based on USGS 2014 Breeding Bird Survey Data 1966-2012. Available at: http://www.mbr-pwrc.usgs.gov/cgi-bin/atlasa12c.pl?ILL&2&12

2- Listed as a species of greatest conservation need due to declines in abundance and distribution from historic levels (Partner In Flight 2000).

Alternative 1, No Action

Direct and Indirect Effects

As described in Chapter 2 for the No Action alternative, no improvements to the powerline structures and conductor would occur, thus there would be no power pole replacement or access route improvements. Existing ROW maintenance would continue. Currently, much of the powerline is maintained every other year, which consists of using a flail mower and tractor to remove vegetation along the entire ROW. Herbaceous and woody vegetation is removed to a height of approximately 6 inches and effects to wildlife include direct mortality and disturbance during mowing. Because mowing across most of the powerline can occur throughout the spring and summer months, effects include mortality to breeding individuals and nesting young of the year.

Early successional or old field vegetation along the ROW can provide habitat for a number of grassland/shrub nesting species, including several migratory birds that are experiencing population declines (Yahner et al 2002). While ROW vegetation would continue to provide nesting and foraging habitat for a variety of wildlife, continued mowing has and will continue to reduce the quality of grassland nest habitat (Pruitt 1996, Herkert 2001).). Similarly, because woody vegetation is reduced through mowing, the ROW would continue to provide little shrub nesting habitat.

While much of the access to the ROW occurs via county and NFS designated roads, existing undesignated roads are also being used. Project area roads are shown in Figure 3 (Fountain Bluff), Figure 4 (Big Muddy), Figure 5 (Cedar Creek), and Figure 6 (Cave Creek). See also Appendix B for all project area maps. Under No Action, existing road management would be unchanged and year-round access from open roads would continue. Based on field observations (Reitz 2014a), unauthorized ATV use is also occurring along undesignated roads into Cedar Creek and Bolton Hollow. These roads are currently open to public access and trails are expanding off of the road along the Cedar Creek floodplain. Effects to wildlife include disturbance and mortality associated with continued road use, until such a time as these undesignated roads are closed. Several undesignated road corridors are on steep slopes, poorly drained and are actively contributing sediment into project area watersheds. Under No Action, sedimentation and reduced water quality from these point sources, particularly in the Cedar Creek drainage would continue, and could potentially adversely affect wildlife and aquatic species.

Cumulative Effects

Since the only direct and indirect effects to wildlife that would result from implementation of the No Action alternative are those associated with the continuation of existing mowing and powerline maintenance, there would be no additional proposed project activities that would produce cumulative effects. Other than effects of ROW maintenance described above, existing forest and non-forest habitat would be unchanged under this alternative as would the level of any maintenance-caused mortality. The suitability of the ROW for grassland and shrub nesting birds would remain low and no adverse cumulative impact to wildlife and aquatic species would be expected under this alternative.

Alternative 2, Proposed Action

The effects of the Proposed Action on wildlife are best disclosed by looking at the impacts of activities related to road construction and reconstruction, and work on the powerline. The Wildlife Specialist Report provides extensive detail about the impacts to wildlife and aquatic species. That detail will be summarized in the discussion that follows. Important design criteria are discussed briefly where appropriate in the effects discussion below, and would be implemented to eliminate or reduce impacts to wildlife and aquatic species. These measures may be found in Appendix A – Design Criteria.

Direct and Indirect Effects

The activities necessary to prepare the access routes for use can affect wildlife in a variety of ways including harm or harassment during construction or use, loss or degradation of habitat, increased human access, or by creating barriers to wildlife movement and dispersal (NRDC 1999). Temporary clearings will also be created at a number of locations in order to move the long power poles onto the ROW. While some effects may occur on all roads, many effects will vary depending on the existing road condition and use, or location of the road corridor. The miles of roads affected and the estimated amount of clearing on NFS lands are summarized by wildlife analysis area in Table 8. The effects of activities occurring specifically in each wildlife analysis area are disclosed in detail in the Wildlife Specialist Report.

Table 8. Analysis area road miles and clearing1

Activity/Road Standard	Analysis Area				
	Fountain Bluff	Big Muddy	Cedar Creek	Cave Creek	Total
County Road Miles	0.1	1.1	0.0	0.0	1.21
Level 1 Road Miles	0.0	1.2	1.8	0.0	3.0
Level 2 Road Miles	1.1	0.8	1.06	1.25	4.21
Level 3 Road Miles	0.0	2.3	1.52	1.4	5.22
Non-designated Road Miles	0.8	0.0	1.01	1.36	3.17
Total Road Miles	2.0	5.41	5.39	4.01	16.81
Transmission Line	0.5	3.1	3.2	2.0	8.8
Estimated Clearing acres	4.7	0.9	5.2	2.6	13.4

1 – Activities are displayed for National Forest System Lands only

Effects Common to All Roads

Direct effects would largely be limited to activities that occur to the roadbed and associated road corridor. Direct effects from tree removal include possible harm or mortality when the tree is felled. The likelihood of harm would be greatest during the breeding season when nests and roosts with less mobile young of the year are present. Because design criteria would restrict removal of snags or live trees between April 1 and November 15, any removal would occur outside the breeding season for most species. As a result, nests or less mobile young-of-the-year would not be present, and the likelihood of mortality during tree removal would be low.

Route construction activities including clearing of roadside vegetation, grading and resurfacing, and culvert/ditch line maintenance, would potentially also result in mortality of less mobile species, or disturbance to sensitive wildlife species. Disturbance to wildlife from roads is largely dependent on the level and season of use along with whether or not a road is open, closed or restricted. The Shawnee NF reduces impacts to wildlife by keeping roads into key habitats closed or restricted during critical periods of the year. Road management on County and most NFS designated roads would be unchanged, whereas some undesignated roads that are currently open to public access would be closed. Access on undesignated roads would be limited to administrative use or for ROW maintenance by Ameren As a result, the road management strategy in effect would be expected to reduce potential impacts to wildlife in these areas.

Effects to wildlife from clearings associated with road construction would include a reduction in mature forest habitat on approximately 13 acres of SNF lands across the project area. Potential adverse effects to wildlife would include a possible increase in predation/parasitism for 15 to 20 years, until forested cover is re-established on the site. Other potential adverse effects would include possible mortality or avoidance during implementation of activities. The small openings created by removing trees to widen the access routes would result in little change in the habitat conditions within the affected stand, but rather would serve as a within-stand habitat inclusion, and the wildlife community would be largely determined by the predominant

structural conditions of the forest around the clearing. As a result, there would be little change in stand-level habitat from proposed clearings. While there would be a small reduction in mature forest, clearings would create habitat for species that utilize small patches of early structural forest, including some early successional species, as well as a number of mid- to late seral species (DeGraaf et al. 1992, Tucker 1992).

Studies of forest birds show that nest predators and parasites are reduced in predominantly forested areas (Askins 2012, Robbins et al. 1989). For example in the mid-west, scarlet tanagers, an area sensitive MIS, are predicted to occur in virtually any size forest patch within landscape blocks that are more than 70 percent forested (Rosenberg et al. 1999). This is a consideration within the Ameren project area because over 80 percent of all lands and 90 percent of NFS lands are forested. Because of the small scattered nature of the clearings, treatment would not further fragment the forest, and where they exist, interior habitat conditions would continue to be provided. Similarly, nest predation and parasitism are reduced in predominantly forested areas (Robbins et al. 1989, deCalesta 1998). So while an increase in predation and brood parasitism may occur, because of the small scattered size of the clearings, the regeneration of forest in the clearings, and the continued predominance of mature forest around the site, adverse effects associated with predation or brood parasitism would be reduced. As a result, there would be no long-term adverse impacts from fragmentation.

Effects Common to Undesignated Roads

Low standard roads similar to existing undesignated roads have been shown to be barriers to the dispersal of some small mammals, reptiles and amphibians (NRDC 1999, PARC 2006). Because proposed work includes grading and surfacing, localized dispersal and movements of some species would continue to be modified or reduced.

Roads can degrade stream ecosystems by introducing high volumes of sediment into streams, changing natural stream flow patterns and altering stream morphology. Deposition of sediment can also adversely affect amphibian and invertebrate species diversity and abundance (NRDC 1999). Many of the undesignated roads are currently open to year-round public use, are located on steep slopes or in drainage bottoms and are actively contributing sediment into local watersheds. Design criteria would potentially reduce any short-term increases in sediment during construction, while proposed work would improve drainage and reduce existing sedimentation over the longer term. Additionally, existing open roads into Horseshoe Bluffs and portions of the Cedar Creek Bottom would be closed and while some unauthorized ATV activity may still occur, it is expected that unauthorized use would be reduced. Therefore, proposed activities would result in a long-term improvement in stream and riparian habitat, as well as reduce impacts to aquatic resources.

Some undesignated roads, including several into more remote areas (e.g., Little Grand Canyon), or areas with sensitive habitats (e.g., wetlands/rocky areas) are currently open to public use and disturbance to wildlife can occur year round. While road use of undesignated roads would increase during construction, because these roads would be closed to public access during and following implementation, disturbance and mortality to wildlife associated with road use would be reduced.

Proposed Powerline Activities

Construction and maintenance activities along the powerline would also impact wildlife. Work would include replacing the existing structures and wires (see the description of Alternative 2, Proposed Action in Chapter 2), and would also include clearing of low growing vegetation and some grading and surfacing along the center of the ROW. Approximately 13 acres of grassland habitat would be affected, including a long-term loss of habitat on approximately 10 acres that would be associated with blading and surfacing. Because work would be concentrated in the center of the ROW, habitat outside of the lines would be largely unaffected during construction. Direct effects would be similar to those described under road construction and activities may cause direct mortality to less mobile species. Also, species sensitive to disturbance and increased human activity would move out of the area during construction.

Ameren is required by national standards that establish minimum clearings to ensure safe operation. Therefore, Ameren must keep the ROW clear of vegetation that impedes access to the powerline. To control vegetation height, most sections of the ROW are mowed every other year. This maintenance schedule is expected to continue. Effects to wildlife include short-term disturbance to sensitive species along the ROW and the access roads during maintenance operations.

Removal of vegetation in the ROW would result in direct mortality to small mammals or birds during vegetation removal. The likelihood of mortality largely depends on the time of year. If mowing occurs during the breeding season when nests or less mobile young are present, the risk of mortality would be higher. While habitat for many grassland and shrub nesting species is reduced along the ROW due to frequent mowing, continued mowing would be expected to result in disturbance and mortality to wildlife. Habitat conditions along the ROW would be largely unchanged.

Species Effects

The Wildlife Specialist Report and Biological Evaluation include extensive documentation of the analysis on important individual species that resulted in conclusion regarding effects determinations. This includes disclosure regarding T&E species Indiana bat, Gray bat, and Northern long-eared bat. It also includes such sensitive species as Rafinesque big-eared bat, Southeastern myotis, Eastern small-footed bat, tri-colored bat and little brown bat, and disclosure on State listed species, Forest species with viability evaluation and Forest MIS. Table 9 summarizes determinations for terrestrial and aquatic evaluated including TES, MIS, Illinois State listed and Forest species with viability evaluation. Species that are in more than one of these categories are duplicated.

Table 9. Effects determination summary

Species	No Action	Proposed Action
Threatened and Endangered Species		
Pallid sturgeon	No Effect	No Effect
Indiana bat Gray bat Least tern		May Affect, Not Likely to Adversely Affect.
Northern long-eared bat		Not Likely to Jeopardize
Regionally Sensitive Species		
Northern copperbelly watersnake Illinois chorus frog Redspotted sunfish Bantam sunfish Black sandshell Purple Lilliput *Caeciodotea beattyi* *Caeciodtea bicrenata whitei* *Caecidotea stygia* Anomalous spring amphipod Packard cave amphipod Bousfield's amphipod Indiana crayfish Bigclaw crayfish Carinate pillsnail *Cavenicolous springsnail* *Sphalloplana hubrichti* *Ergodesmusremingtoni*	No Impact	No Impact

Species	No Action	Proposed Action
Pseudosinella argentea Short-tailed bacruid Mississippi green watersnake Flathead snake Subtle stygobromid		
Rafinesque's big-eared bat Southeastern myotis Eastern small-footed bat Northern long-eared bat Tri-colored bat Eastern woodrat Henslow's sparrow Cerulean warbler Bald eagle Migrant loggerhead shrike Swainson's warbler Alligator snapping turtle Eastern narrow-mouth toad Bird-voiced treefrog	No Impact	May Impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability.
Timber rattlesnake	May Impact individuals, but is not likely to cause a trend toward federal listing or a loss of viability.	
Illinois State Listed Species		
Big-eye shiner Sturgeon chub Western sand darter Common moorhen Least bittern Barn owl	No effect to individuals, habitat or local viability.	
Indiana bat Gray bat Northern long-eared bat Rafinesque big-eared bat Eastern woodrat Cerulean warbler Swainson's warbler Eastern narrow-mouth toad Bird-voiced treefrog Marsh rice rat Golden mouse Mississippi kite Loggerhead shrike Smooth softshell	No effect to individuals, habitat or local viability.	Individuals may be affected. Habitat and local viability maintained
Timber rattlesnake	Individuals may be affected. Habitat and local viability maintained	
Forest Species with Viability Evaluation		
River otter American woodcock Northern bobwhite Red-headed woodpecker Wood thrush Worm-eating warble Yellow-breasted chat	No effect to individuals or local viability	Individuals may be affected. Would not reduce local viability.

Species	No Action	Proposed Action
Gray treefrog		
American woodcock Northern bobwhite	Individuals may be affected. Would not reduce local viability.	Individuals may be affected. Would not reduce local viability.
Management Indicator Species		
Northern bobwhite	Individuals may be affected. Habitat and local populations maintained.	Individuals may be affected. Habitat and local populations maintained.
Worm-eating warbler Scarlet tanager Woodthrush Yellow-breasted chat	No effect to individuals. Habitat and local populations maintained.	

Cumulative Effects

Cumulative effects to terrestrial and aquatic species have been evaluated on private and NFS lands within a 6,637 acre project area selected for this wildlife analysis. A 15-year timeframe, out to 2029, was used to assess impacts. In order to understand the contribution of past actions to the cumulative effects of the proposed action, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. On-going and anticipated future activities are summarized in

Table 10.

Table 10. Cumulative effects summary

Activity	Description
Firewood Harvest	Scattered across the project area along open roads
Dispersed Recreation	Continued at scattered locations across the project area
Ameren Road re-construction	17.8 Miles
Ameren Powerline Construction and Maintenance	10.8 Miles
Invasive Weed Control	Scattered treatment concentrated along roads and disturbed sites.
Road Maintenance	Forest, county, state and private roads across the project area.
Unauthorized ATV use	Variable across the project area
Agriculture – cultivated crops and pasture/hay[1]	135 acres
Private open land development[1]	103 acres
Oakwood Bottoms impoundment	1,200 acres seasonal impoundment
Prescribed Fire	Approximately 500 acres per year

1 – Based on Illinois GAP land cover GIS data

Regarding aquatic effects, collectively the past, present and future activities have most likely contributed to adverse impacts to water quality through increased sedimentation. Because the proposed action may further increase sedimentation during construction, this would contribute towards reduced water quality and hence result in an adverse cumulative impact. However, any increase would be short-term during construction. The proposed action would close roads that currently have unauthorized ATV use and thus, reduce erosion. Consequently, while there may be a short-term increase in sedimentation, over the long-term, proposed actions would be expected to improve water quality and maintain aquatic habitat. This improvement would be further enhanced by application of Forest Plan standards and guidelines and implementation of project design criteria and best management practices. Also, the pre-existing erosion and poor drainage conditions on some access routes would be corrected, resulting in a long-term improvement in water quality. Therefore, this would be expected to result in an overall positive cumulative impact to aquatic species.

Regarding effects to terrestrial wildlife, disturbance associated with ATV use, firewood cutting private land activities, road maintenance, invasive weed treatment, recreational use, oak restoration and firewood cutting would continue. Proposed road re-construction, pole replacement and ROW maintenance would contribute additionally to existing disturbance and possible mortality during project implementation, and thus result in a minor adverse cumulative impact. However proposed road closures would reduce disturbance into the Cedar Creek Bottom, Horseshoe Bluffs and Little Grand Canyon, and sensitive wildlife habitats in these areas.

In addition to clearing on NFS land, it is estimated that an additional 2 acres of clearing may be necessary on private land. Habitat changes from proposed activities would include a reduction in mature forest on approximately 15 acres, whereas habitat for wildlife that utilizes small pockets of early successional forest would benefit from an increase in this acreage. This slight change in habitat would not be expected to measurably contribute to past, ongoing and future activities.

In summary, direct effects of implementation would be short-term. Project design criteria would reduce disturbance and mortality to species with viability evaluation including TES, state listed species and Forest species with viability evaluation identified in the Forest Plan. Only 15 acres of forest (both NFS and private lands) would be affected, and there would be little change in stand level habitat. While activities on NFS and private lands would continue, existing uses or patterns of use are not expected to change. There would be little change in the availability of suitable habitat during the analysis period. Therefore, there would be no measureable increase in long-term adverse cumulative effects to wildlife.

Access Routes and Transportation System

The discussion that follows describing the affected environment and disclosing the environmental effects for the access routes and transportation system analysis have been summarized from the Engineering Report and from the Road Condition Surveys report, both found in the project record. This section will focus mainly on describing the access routes and the work needed to prepare them for use by the heavy construction equipment. The construction needed to improve (reconstruct) and/or construct the routes and replace the power poles in the ROW would result in impacts to various resources such as soil and water, wetlands, botany, and wildlife. As such, those impacts will be disclosed in the sections for those various resources.

A number of assumptions were used to guide the disclosure of impacts related to the access routes and transportation system:

- Route distance figures have been estimated from mapping or from field inventory. Mileages have been updated throughout the planning process as better information has been made available and may change slightly with additional field verification and during actual project implementation.
- Road work and infrastructure improvements would be conducted in accordance with Best Management Practices.
- The spatial boundary and subject for analysis includes the network of roads within the project area.
- Effects are assessed based on a 5-year time frame, assuming all project actions associated with the transportation network would be completed by that time.

Furthermore, the transportation analysis is based on the specific routes proposed for project use, as well as the general Forest corridor (ROW) along the powerline. The cumulative effects analysis is based on known current and reasonably foreseeable projects within the HUC6 watersheds that overlap the powerline project.

Affected Environment

Information on the affected environment may be found above in the General Affected Environment for the Project Area section and the Wildlife and Aquatic Resources section. As described under the Proposed Action, Ameren would need to access the pole locations with heavy equipment over many different access

routes for different sections of the ROW that include FS designated roads, non-designated roads, county roads, or other possible routes such as old logging roads and trails not formally designated on the FS road system. For those access routes that cross private lands, Ameren would be responsible for implementing their Stormwater Pollution Prevention Plan's Best Management Practices to reduce or eliminate impacts.

Effects Analysis

No unresolved issues were identified during project scoping relating to the access routes and transportation system. Indicators used to frame the analysis of transportation effects include forest transportation system conditions, traffic levels, and health and safety concerns.

Alternative 1, No Action

As described in Chapter 2 for the No Action alternative, no improvements to the powerline structures, wires, and conductor would occur, thus there would be no power pole replacement or access route improvements. Existing ROW maintenance would continue. Therefore, there would be no direct effects for this alternative. Indirect effects are anticipated due to past lack of maintenance and route improvements. Field visits have shown that many of the existing roads and access routes have badly deteriorated due to poor drainage and lack of maintenance. It is anticipated that under this alternative, that lack of maintenance and deterioration would continue and thus, rutting could become deeper. There would also be a corresponding slight and continued decrease in public and administrative health and safety due to the deteriorating powerline poles, including an increase in fire danger where low-hanging wires come close to the ground.

Cumulative Effects

Since the only direct and indirect effects to the transportation system that would result from implementation of the No Action alternative are those associated with the continuation of existing mowing and powerline maintenance, there would be no additional proposed project activities that would produce cumulative effects for this alternative. Existing routes would continue to be used for powerline access as has been done in the recent past under the existing special use permit; maintenance would also continue, including vegetation management and mowing. This situation would continue into the foreseeable future. Routes would also continue to receive traffic from other Forest users, as well as occasional administrative traffic. Light traffic over time would be expected to contribute to continued route deterioration on lower-standard routes not receiving scheduled maintenance. Higher standard system roads would continue to receive regularly scheduled maintenance.

Alternative 2, Proposed Action

Road width and the level of work needed would determine the degree of environmental impact; the wider the road width, the more trees that would need to be removed and thus, more habitats would be impacted. While a minimum width of 12 feet would be needed for most sections, it is anticipated that a maximum turning radius of about 150 feet would be needed to allow passage of the long poles around corners along the routes. All access routes have been located to minimize tree cutting and impacts to soil and water. Over 1,100 trees, predominantly less than 5 inches in diameter, have been identified as needing to be removed to reconstruct the access roads (see the Wildlife and Aquatic Resources section). Access along the ROW between towers will be confined as much as possible to a 20-foot-wide travel-way along the center line of structures unless the terrain does not allow it.

Roads used solely for access to the powerline will be included in Ameren's permit to provide future access for maintenance. Ameren will be responsible for maintaining these roads at a level that keeps them from eroding or rutting while supporting access by mowing or maintenance crews. Forest System roads used for public access to the area will continue to be maintained by the Forest service.

Direct and Indirect Effects

The necessary road and route improvements, realignments, and widening would create additional disturbed and compacted areas during implementation. A total of approximately 16 miles of access routes have been proposed for use and would most likely need some level of improvement. This would include improvements to maintenance level 1, 2, and 3 FS roads and roads not formally designated on the Forest Service road system (non-designated roads), and also private and county roads (see the Wildlife and Aquatic Resources section). Best management practices would be used during implementation to minimize negative effects related to compaction, erosion, and runoff. Field inspections have found a number of concerns on some of the existing access routes including deep rutting, erosion, and severe compaction. The proposed activities would correct the existing poor drainage and would result in a more sustainable system that in the long run would produce less erosion. Traffic would increase during implementation (short-term), and would be expected to return to current levels. Ongoing maintenance for infrastructure, including vegetation mowing and any necessary short-term improvements to the access routes, would continue.

There would be a short-term increase in traffic during project implementation due to the movement of various construction equipment, construction activities, and tree felling operations. Use of the design criteria, including traffic control, would be expected to minimize these adverse effects. In the long-term, there would be an expected improvement in road conditions and thus, public health and safety, through use of the appropriate design standards and best management practices, resulting in a more stable and better managed transportation network with minimal erosion and drainage problems. Proper road management and use of appropriate road closure devices would minimize conflicts with public use and powerline management.

Cumulative Effects

Since existing access routes, once improved, would be used to reach the powerline corridor, there would essentially be no increase in Forest system or private roads or trails. Therefore, considering past actions and reasonable foreseeable actions, there would be no adverse cumulative impacts to the transportation system for this alternative. Routes would continue to be used for powerline maintenance, including vegetation management and mowing, for the foreseeable future. Routes would also continue to receive traffic from other Forest users, as well as occasional administrative traffic. Higher standard system roads would continue to receive regularly scheduled maintenance as managed with annual transportation funding appropriations. Proper use of design criteria during project implementation, including best management practices, would minimize long-term erosion and other negative resource effects associated with road construction and drainage issues, and provide for a limited beneficial cumulative impact.

Botany

The discussion that follows describing the affected environment and disclosing the environmental effects for Botany resources have been summarized from the Botany Specialist Reports, plant survey documentation, and Biological Evaluations for all threatened, endangered, and sensitive plants found in the project record.

Affected Environment

Information on the affected environment may be found above in the General Affected Environment for the Project Area section and the Wildlife and Aquatic Resources section. In addition, the habitat for each plant that is either federally listed, a Regional Forester Sensitive Species (RFSS), a State of Illinois Threatened And Endangered Plant Species, or a forest species with viability evaluation is fully discussed in detail in the Botany Specialist Reports and will not be disclosed here. The reports are available in the project record.

Effects Analysis

Two unresolved key issues were identified during project scoping relating to botany resources:

- There is concern that the proposed activities could adversely affect a number of State-listed plant species.
- There is concern that the proposed activities could adversely affect designated natural areas.

Indicators used to frame the effects of the proposed activities on plants of concern include the amount and type of disturbance and its potential impact on the affected species, and the amount and type of disturbance to a nearby natural area.

The spatial, or geographic, boundary for the rare plant resources effects analysis is the Ameren powerline ROW corridor and areas immediately adjacent to it, including the access routes proposed for improvements. All proposed activities that could affect botany resources would be confined to the project area. The temporal timeframe for the analysis is from the past 10 years, to 10 years in the reasonably foreseeable future. This past temporal timeframe was selected since the majority of our knowledge of rare plant resources has only come about within the last 70 years. Ten years in the past and 10 years into the future can accurately gauge the management effects and is short enough so that any unforeseeable adverse impacts can be addressed and mitigated.

Mead's milkweed (*Asclepias meadii*) is the only plant species federally listed as threatened known to occur on the Forest, and is only known to occur in its native condition in Saline County. A total of 83 Regional Forester's sensitive plant species have been documented as historically occurring within the 10 counties of southern Illinois where there are lands managed by the Shawnee National Forest. The Botany Specialist Report and Regional Forester's Sensitive Plant Species (RFSS) Biological Evaluation (BE) in the project record include a detailed table of these species and the counties where they have been located. Species descriptions, habitat, and location information were obtained from NatureServe (2008, 2012, 2014), USDA, NRCS Plants Database (2014), and available data and literature. Information for 2013 and 2014 was also incorporated in this document when new information was presented.

A Botany Specialist Report was completed specifically for additional State of Illinois Listed Species that are not already included in the RFSS BE, Plant Species with Viability Evaluations, and Botanical Extraordinary Circumstances (including designated Natural Areas) report. This report is included in the project record. The report lists 58 State of Illinois Threatened and Endangered plants and 5 other plant species with viability evaluations known to occur or have been documented as historically occurring within the 10 counties of southern Illinois.

Specifically for this project, floristic surveys were conducted in 2013 on September 27 and 30, October 22, 24, 25, and 26. Additional surveys were conducted in 2014 on June 3 and 5. Over 300 different species were observed. A complete list of the species encountered may be found in the Botany Specialist Report available in the project record.

Mead's milkweed (*Asclepias meadii*), federally listed as threatened, was not found in any areas where activities are proposed. Nine rare plant resources have been documented as being present in or near the project area. The only RFSS encountered during the surveys was *Dodecatheon frenchii* (French's shootingstar, state-listed threatened). There are other known rare plant locations within or adjacent to the project area for *Cynosciadium digitatum* (Finger dogshade, state-listed endangered), *Eleocharis wolfii* (Wolf's spikerush), a plant strongly resembling *Matelea obliqua* (climbing milkweed, state-listed threatened), and *Melothria pendula* (Guadeloupe cucumber, state-listed threatened).

There are other species documented near the project area that include *Botrychium biternatum* (sparselobe grapefern, state-listed threatened), other *Dodecatheon frenchii* locations, *Glyceria arkansana* (Arkansas mannagrass, state-listed endangered), *Synandra hispidula* (Guyandotte beauty, state-listed endangered), and

Torreyochloa pallida (Pale false mannagrass, state-listed endangered). However, these known locations are not within or adjacent to the project area and should not be impacted.

Alternative 1, No Action

Direct and Indirect Effects

As described in Chapter 2 for the No Action alternative, no improvements to the powerline structures and conductor would occur, thus there would be no power pole replacement or access route improvements. Existing ROW maintenance would continue. Therefore, there would be no direct or indirect adverse impacts from the proposed project activities for this alternative. However, ongoing maintenance may directly benefit some of the species that could be growing along the ROW. Many of the nine rare plant species noted above or their potential habitat, specifically Finger dogshade, Wolf's spikerush, Arkansas mannagrass, Pale false mannagrass, and Guadeloupe cucumber would benefit because of the additional sunlight along the powerline corridors that would result from continued maintenance.

Cumulative Effects

Since the only direct and indirect effects to plants that would result from implementation of the No Action alternative are those associated with the continuation of existing mowing and powerline maintenance, there would be no additional proposed project activities that would produce cumulative effects for this alternative. Some level of ongoing maintenance would be expected to continue into the foreseeable future. Cumulatively, there should be no negative impacts to the species listed above from the periodic mowing along the ROW or to the nearby natural area, the Little Grand Canyon/Horseshoe Bluff Ecological Area.

Alternative 2, Proposed Action

Direct and Indirect Effects

The level of disturbance that could affect rare plants and plants of concern would be ground disturbance associated with access route improvements and power pole replacement. Activities that disturb or destroy existing plants would result in an adverse impact. Since Mead's milkweed, federally listed as threatened, was not found in any areas where activities are proposed, there would be no impact to this species. Design criteria would protect two of the three species found in areas subject to the disturbance proposed, French's shooting star (State-listed threatened) and climbing milkweed (State-listed threatened).

French's shooting star is known to occur at Little Grand Canyon/Horseshoe Bluff Ecological Area; however, the south side of the Ecological Area is well marked and borders the powerline where power poles will be replaced. This species is not known from this boundary area and therefore, would not be negatively impacted. It is also known from Cave and Cedar Creek valleys. A few plants were found during floristic surveys in section 7 of T10S R2W. These plants appear to be far enough away from the traffic along the roadway so that there would be no impacts to these plants. This site will be marked and avoided during project implementation.

A plant was found along one of the roadways in T10S R2W Section 7 strongly resembling climbing milkweed, a State-listed threatened species. However, it was not in flower and as such, its identity could not be confirmed. The habitat that this plant was growing in is typical for climbing milkweed so this plant will be treated as *Matelea obliqua*. This site will be marked and avoided during project implementation.

Guadeloupe cucumber is known from the powerline corridor in the Fountain Bluff Area. This annual has flourished in the powerlines from the cutting of vegetation every two years, giving it an opportunity to compete with other aggressive vegetation. In addition, this species likely has a sufficient seed bank in the corridor so that it should re-establish itself following project implementation. It is expected that some plants

of this species may be damaged in the short-term during implementation but should continue to thrive in the long-term. No avoidance of this species is necessary.

Finger dogshade and Wolf's spikerush may possibly be damaged or destroyed at one project location in Oakwood Bottoms. These two species were not found during recent floristic surveys at this one known location. They are each known from at least seven other locations within the Oakwood Bottoms area but would not be impacted at any of these other sites. Heavy equipment activities would ideally occur during the dry season or when the ground is completely frozen to avoid soil compaction that would prevent the success of the seed banks and perpetuation of root systems. However, since these two species were not found during floristic surveys at their original sites, it may be assumed that they no longer occur here, although potential habitat occurs. It is highly unlikely that the disturbance needed to install the new poles would actually traverse these previously known locations. Therefore, machinery may be operated during wet periods. Any damage or destruction to these two historic populations would not cause a loss of viability to these species that would lead to a trend toward federal listing.

Arkansas mannagrass and Pale false mannagrass occur within the Oakwood Bottoms area and Arkansas mannagrass also occurs near the Natural Bridge area, but neither is known from within or adjacent to the powerline corridor or roadways. Guyandotte beauty occurs near the Cedar Creek and Bear Creek areas north of the Natural Bridge but is also not known from within or adjacent to the powerline corridor or roadways. Sparselobe grapefern is known from Little Grand Canyon/Horseshoe Bluff Ecological Area and from the Cedar Lake valley. The known locations for this species are nearly two miles north of the powerline corridor. When in potential habitat for these four species, activities would ideally occur during the dry season or when the ground is completely frozen so that any soil compaction would not interfere with the success of seed banks and perpetuation of root systems. However, since these species are not known to occur within or immediately adjacent to the project area, it machinery may be operated during wetter periods. No long-term adverse impacts to these species would be expected.

A nearby natural area, the Little Grand Canyon/Horseshoe Bluff Ecological Area, borders the powerline on its south side for a little over a half mile. Ameren has continued to maintain the ROW corridor (mowing and cutting encroaching vegetation) up to the boundary without any adverse impacts. As proposed, all maintenance activities and power pole replacements would remain in the ROW; there are no access route improvements near the Little Grand Canyon/Horseshoe Bluff Ecological Area. Therefore, there would be no negative impacts to this natural area.

Cumulative Effects

The same spatial and temporal boundaries described above have been used for the cumulative effects analysis. Since there would be no direct or indirect impact to Mead's milkweed (federally listed as threatened), there would likewise be no cumulative effect. The rare plant species found in areas subject to the proposed disturbance, French's shooting star, and Climbing milkweed will be protected. Design criteria, including marking areas for avoidance and monitoring known locations during and after implementation, would protect these two species found during surveys. Since there should be no direct or indirect impacts to French's shooting star and Climbing milkweed, there would be no cumulative impacts.

As explained above, Finger dogshade and Wolf's spikerush plants may be adversely impacted at one project location in Oakwood Bottoms. However, each of these species has at least seven other locations in Oakwood Bottoms and it is suspected that more populations exist elsewhere since there is suitable habitat throughout the area. The proposed action should not impact these species in such a way as to lead to a trend toward federal listing. Conditions created by the maintenance of the powerline would continue to provide habitat conducive to these species in the long term (next 2 years, or as long as mowing continues). These two species would likely re-populate their habitat and thus, there would be no adverse cumulative impacts.

The Guadeloupe cucumber is an annual plant that is thriving from the openness of the powerline corridor. Since the direct and indirect impacts in the short-term are only temporary, and the long-term impacts are beneficial to this species, there will be no adverse cumulative impacts.

The Arkansas mannagrass, Pale false mannagrass, Guyandotte beauty, and Sparselobe grapefern are all known from outside of the impact areas. Since there will be no known negative impacts to any known locations of these 4 species, there would be no adverse cumulative impacts.

Since there would be no direct or indirect impact to the Little Grand Canyon/Horseshoe Bluff Ecological Area, there would likewise be no cumulative impact to this natural area.

Heritage and Cultural Resources

The goal of the heritage resource analysis is the preservation and protection of heritage resources within the proposed Ameren powerline corridor and the assurance that important heritage resources will not be affected by project implementation. The earth-disturbing activities resulting from the proposed action would put heritage resources at risk. Efforts must be made to avoid adversely affecting historic properties during a federal undertaking.

Affected Environment

The National Historic Preservation Act of 1966 (NHPA) and its implementing regulations state, “the agency official shall take the steps necessary to identify historic properties within the area of potential effects. The area of potential effect is defined as “….the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties…The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.” [36CFR 800.16(d)]. The area or bounds of analysis that could directly affect existing heritage resource sites for this project is the clearing width of the powerline corridor and the transportation corridor (access routes) used to service the powerline.

Information on the affected environment may be found above in the General Affected Environment for the Project Area section and the Wildlife and Aquatic Resources section. Regarding heritage resources, the project area has been disturbed over the many decades that the powerline has been in operation. All access routes are also disturbed sites with little new ground disturbance expected.

Effects Analysis

The effects disclosed for the heritage and cultural resource analyses have been summarized from the Heritage Resource Report found in the project record. No unresolved issues were identified during project scoping relating to heritage resources. The indicator used to frame the analysis of heritage effects is the preservation and protection of heritage resources within the proposed Ameren powerline corridor.

Alternative 1, No Action

Direct and Indirect Effects

As described in Chapter 2 for the No Action alternative, no improvements to the powerline structures, wires, and conductor would occur, thus there would be no power pole replacement or access route improvements. There would be no direct effects to heritage resources as a result of the implementation of this alternative because no earth-disturbing activities associated with this proposal would take place.

The existing powerline and access route maintenance would continue under this alternative and potentially produce an indirect effect to heritage resources. This maintenance could potentially lead to additional recreation usage and an increased number of public users may produce an indirect adverse effect. Surveys

have identified five sites within the area of potential effects that may be indirectly affected, all of which have a prehistoric component. Two of the sites have been vandalized in the past, but not necessarily as a result of the presence of the powerline corridor. Archaeological sites across the Forest have been vandalized over the years as a result of individuals searching for valuable artifacts to keep or sell. The remaining three sites do not appear to have been vandalized and therefore have not been affected by the construction and/or maintenance of the powerline. Monitoring of these sites has indicated that no adverse indirect effects have resulted, and this is expected to continue into the future.

Cumulative Effects

Since there would be no direct and indirect effects to heritage resources, there would be no additional proposed project activities that would produce cumulative effects for this alternative. Existing powerline maintenance would continue as has been done in the recent past, including vegetation management and mowing, according to the existing special use permit. Little or no earth-disturbing activities would be occurring during maintenance activities and would not result in any direct or indirect effects; therefore, there would be no cumulative impact. This situation would continue into the foreseeable future.

Alternative 2, Proposed Action

Direct and Indirect Effects

In accordance with Section 106 of the National Historic Preservation Act of 1966, as amended, the Ameren project area was completely inventoried during 2013-2014 (CRR 09-08-03-100). A report detailing our findings and recommendations was forwarded to the Illinois State Historic Preservation Officer (SHPO), in accordance with 36 CFR 800.4. There are 19 archaeological sites recorded within or near the project area. Of these, 13 were previously recorded sites: 7 prehistoric, 6 historic. Six new heritage resources (previously unrecorded) were discovered during the inventory, including 3 prehistoric, 2 historic, and 1 multi-component site.

Of the 19 heritage resources inventoried for this survey, 9 are not eligible for inclusion on the National Register of Historic Places (NRHP); recording their location exhausts their research potential. Nine other sites are considered to be potentially eligible for inclusion on the NRHP. One site that is potentially eligible for inclusion on the NRHP cannot be avoided during the planned project activities. An evaluation of the site against the NRHP criteria has been recommended. A site evaluation consists of determining the physical condition and integrity of the site. Through the excavation of a small number of archaeological units, we will be able to answer the questions: (1) Has the site been damaged by previous earth-disturbing activities; (2) How old are the artifacts that we recovered from the site; and (3) What kinds of prehistoric activities took place at the site? Answering these and other questions will tell us whether the site would be able to contribute meaningful information about the prehistory of the area or region. If the site has poor integrity or does not have the ability to contribute meaningful information on the prehistory of the area, it will be found not to be eligible for inclusion on the NRHP.

As noted above, maintenance of the ROW and access routes would potentially result in indirect effects to heritage resources due to additional recreation usage and an increased number of public users under the proposed action alternative. Surveys have identified five sites within the area of potential effects of this project that may be indirectly affected, all of which have a prehistoric component. Measures to mitigate the effect of the increased number of users on heritage resources would include monitoring of usage and those potentially affected sites. If monitoring determines that sites are being indirectly affected by public users, the travel ways will be modified to avoid continual or future impacts.

Cumulative Effects

Cumulative effects analysis takes into account all known past actions, present proposed actions, and any reasonably foreseeable actions that could result in an additive cumulative effect. For heritage resources, it is

important to consider impacts from actions well back in time. The area under consideration is in and around the powerline corridor and each of the access routes.

Heritage resources have been inventoried for all federal undertakings, both in the Shawnee National Forest in general and this project area in particular, since 1977 prior to earth disturbing land management activities. Prior to 1977 heritage resources were not routinely protected from possible impacts though cultural resource inventories and concomitant protective measures. Activities occurring prior to 1977 that may have impacted heritage resources in the project area include nineteenth century land clearance activities (logging for agricultural production and later for mine and railroad ties) and concomitant inappropriate agricultural activities such as plowing and subsequent erosion, and mineral prospecting and extraction activities. Past Forest Service land management activities and actions on NFS lands that may have affected heritage resources in the past (between 1933 and 1977) include agriculture; wildfire; tree planting; dispersed recreation and unauthorized ATV use; utility construction and maintenance; road construction and maintenance activities; and special-use management for logging on adjacent private lands.

The major impact to heritage resources in the past was the original land clearing activities and the cultivation of inappropriate landforms that led to substantial erosion. Cultivation and erosion degraded many ridge top prehistoric camp and village sites.

Present actions in the project area and vicinity include powerline and right-of-way construction; maintenance and use; management of non-native invasive species; unauthorized ATV and OHV use; user-made trail creation and continued recreation use. All these would also be considered reasonably foreseeable actions.

For the present proposed action, the analysis concluded that there would potentially be one direct adverse effect to heritage resources as a result of implementing the present federal action, the effect of which will be mitigated through the section106 evaluation process in consultation with the State Historic Preservation Officer, and a determination of eligibility for inclusion on the National Register of Historic Places prior to project implementation. If the site has poor physical integrity or does not have the ability to contribute meaningful information about the prehistory of the area, it will be determined to not to be eligible for inclusion on the NRHP, and further mitigation or monitoring will not be necessary. If the site does have the ability to contribute meaningful information about the prehistory of the area, further excavation may be necessary to protect the archaeological material from potentially damaging project related work activities.

As also noted in the No Action alternative, there is the potential for indirect effects to five other historic properties as a result of access route maintenance and enhanced access. The indirect effects will also be mitigated through project monitoring and access route modification, as needed. Therefore, there would be no cumulative effects to heritage resources as a result of the implementation of this project.

Soil and Water Resources

The discussion that follows describing the affected environment and disclosing the environmental effects for soil and water resources has been summarized from the Soil and Water Resources Report available in the project record. The primary purpose of this assessment is to determine whether the likely effects would result in a degradation of watershed resources (soil and water) in the project area.

Affected Environment

Information on the affected environment may be found above in the General Affected Environment for the Project Area section and the Wildlife and Aquatic Resources section. Further detailed soil and water information is included in the Soil and Water Resources Report. Information is provided for soils by their proximity to the pole replacement locations and details the soil mapping unit by hydric soils, riparian soils, and prime farmland designations where available. Some power poles to be replaced in the ROW are located in areas designated as floodplain soils or hydric soils, or both. Some pole locations lie in upland areas, some

in floodplain but not hydric soil units (indicating frequently flooded), and some are on floodplain and hydric soils (indicating occasionally flooded situation). A few of the pole locations occur on soil mapping units designated as prime farmland. Nearly half of the sites where replacement of structures is proposed are located on hydric soils and the proposed access routes do occasionally cross wetlands, particularly in the Oakwood Bottoms area. See the Proposed Action description for the pole replacement process to be used in areas that are identified as most susceptible to flooding.

Soil erosion potential is generally high on soil mapping units with slopes greater than 10 percent and soil compaction potential is very high for nearly every soil mapping unit in the activity area. Soils are generally wet and more erodible during the fall, winter, and spring; most trails and access roads in the project area are already compacted and are also more compactable during the fall, winter and spring. The powerline corridor has been masticated several times in the past, and hence, the ground is already disturbed from the machinery used for these vegetation treatments.

FS system roads, non-designated roads including private and county roads, previously used access routes, and the powerline ROW are found within the affected sub-watersheds (sixth field watersheds). Approximately 6.4 miles of the access routes and powerline ROW contain portions of wetland complexes including freshwater emergent wetlands, freshwater forested/shrub wetlands, and freshwater pond, lake, and riverine.

One important source of water quality assessment for this analysis comes from the Illinois (State) EPA 2014 Stream Assessment. In accordance with Sections 305(b) and 303(d) of the Federal Clean Water Act, the State EPA must report to the US EPA on the quality of Illinois surface water (e.g., lakes, streams, Lake Michigan, wetlands) and groundwater resources (Section 305b), and provide a list of those waters where their designated uses are deemed "impaired" (Section 303d). In addition, the State EPA must assess the water quality of all publicly-owned lakes in accordance with section 314(a)(1) of the Clean Water Act. To aid in making these determinations, the State EPA annually collects chemical, physical, biological, habitat, and toxicity data, depending on the type of water body. Data collected from outside sources may also be considered during this process.

Resource quality conditions are assessed in terms of the degree to which waters attain "beneficial uses", also called "designated uses". Pollution control programs are designed to protect designated individual uses, including aquatic life, indigenous aquatic life, primary contact (swimming), public and food processing water supply (drinking water), secondary contact, aesthetic quality, and fish consumption. Each state has the responsibility to set water quality standards that protects these uses. In Illinois, the Illinois Pollution Control Board is the regulatory body responsible for establishing water quality standards.

This 2014 analysis covers the seventy-four 6th field watersheds in the Shawnee National Forest. This information may also be found in the project record. Water quality has been evaluated according to five beneficial uses and rated by the State EPA in this analysis as fully supporting, non-support, or not assessed (unknown). For any stream and lake reach receiving a less than full support designation, the source and causes of non-attainment must be identified. Lakes (public and private) evaluated by the State EPA are also identified. Runoff from forest, grassland, parkland, loss of riparian habitat, and stream-bank modification are the sources occurring on areas near the Ameren project area, and most of this runoff likely occurs on private lands. For the SNF, water quality is generally good.

Segments of six SNF rivers are candidates for inclusion in the Wild and Scenic River system. The Management Prescription in the SNF Forest Plan states that these stream corridors must be managed consistent with the Recreation or Scenic classification. River segments from one of these rivers, the Big Muddy River, are located within the analysis area.

Effects Analysis

No unresolved issues were identified during project scoping relating to soil and water resources. The indicators used to frame the analysis of effects to soil and water resources are sediment delivery, soil erosion, and soil compaction.

Alternative 1, No Action

Direct and Indirect Effects

As described in Chapter 2 for the No Action alternative, no improvements to the powerline structures, wires, and conductor would occur, thus there would be no power pole replacement or access route improvements. Existing ROW maintenance would continue. Since there would be no ground disturbance from the proposed activities, there would be no direct impacts to soil and water resources for this alternative. Soils would be impacted by the on-going maintenance and use of the access roads and powerline ROW, as well as planned and on-going natural resource management activities. In the absence of wildfire, current runoff and erosion pattern would be maintained. An upland erosion rate of less than one ton per acre per year is predicted by the Forest Service Water Erosion Prediction Project model (FSWEPP) for stands on steep slopes. Natural processes and functions would continue to occur as dead material decomposes, and therefore, actual soil organic matter may increase with an accompanying increase in microorganisms and fungi. As decomposition proceeds, dead and down material would eventually be incorporated into the organic horizon and surface horizons leading to increased soil nutrient capital.

There would be no tree cutting or road improvements under this Alternative. Soil quality and productivity would be increased in the long-term as organic matter decomposes. Soil compaction would most likely continue at its existing level. The No Action alternative would not result in measurable changes to water quality and water quality would be maintained at current levels. All existing poor drainage and erosion issues found in some areas of the access routes would continue to deteriorate until remedied. Some geologic erosion could be expected to continue and some of this sediment could be expected to enter the streams.

Cumulative Effects

Since the only direct and indirect effects to soil and water resources that would result from implementation of the No Action alternative are those associated with the continuation of existing mowing and powerline maintenance, there would be no additional proposed project activities that would produce cumulative effects. Barring some catastrophic event, current levels of sediment delivery, soil erosion, and soil compaction would continue into the foreseeable future. As noted, those access route locations that are rutted and poorly draining will continue to see further erosion. The work to correct those problems as described under the Proposed Action alternative would not occur under No Action.

Alternative 2, Proposed Action

Direct and Indirect Effects

As described above in the description of the Proposed Action (Chapter 2) and in the Access Routes and Transportation System environmental consequences section, approximately 16 miles of access routes and 9 miles of powerline corridor would be subject to some type of disturbance that could potentially impact soil and water resources. A Storm Water Pollution Prevention Plan (SWPPP) provided by Ameren would be implemented to address environmental impact concerns.

Sediment delivery as a measure of water quality would be approximately 4 to 5 tons per acre. Soil erosion potential as a measure of soil stability would be highest on slopes greater than 10 percent. About 18 structures (power poles) that would be replaced lie on or adjacent to slopes greater than 10 percent grade. The ROW has been masticated several times in the past, and therefore, the ground is already disturbed and

compacted. Ground cover on this area has kept erosion to about 4 to 5 tons per acre soil loss off the surface. The 4 to 5 tons per acre per year erosion figure is considered by the Natural Resources Conservation Service (NRCS) as the soil loss tolerance figure for most of the soil mapping units in the project area. The soil loss tolerance (T) is the maximum rate of soil erosion that a soil unit can have and still permit soil productivity to be sustained indefinitely. These T values were introduced by NRCS research and have generally been accepted by the NRCS (Troeh et al. 1991).

Soil compaction is also used as a measure of soil stability. Soil compaction would occur as result of equipment operation**.** Most trails and roads are already compacted and would become more compactable during the fall, winter and spring near about 56 different structures, particularly those in or adjacent to hydric or highly compactable soils. Field inspections have found a number of concerns on some of the existing access routes including deep rutting, erosion, and severe compaction. The proposed activities would correct the existing poor drainage and would result in a more sustainable system that in the long run would produce less erosion. Overall, there would be a relatively small increase in soil stability impacts.

Site productivity, including that found on the prime farmland and forested areas would be maintained in portions of the project area outside heavily disturbed areas. Site productivity and riparian function on the floodplains in the project area would be maintained with implementation of design criteria described in Appendix A, Design Criteria. Heavily disturbed areas would potentially include eroding existing access route segments, newly constructed access routes, and construction that would result in new gullies and other eroded areas. Direct effects in these heavily disturbed areas would include an increase in soil erosion and compaction, and possible sedimentation into gullies or streams. This erosion, compaction, and sedimentation would decrease soil productivity by reducing the surface soil horizon. Overall, soil loss will remain within tolerable limits.

A number of design criteria (Appendix A) would be implemented to minimize impacts in heavily disturbed areas. These would include such measures as operating equipment only when soils are sufficiently dry or frozen enough during winter season, to support equipment and avoid excessive rutting; using construction matting and low ground pressure equipment to minimize impacts as needed; and seeding and mulching exposed areas. Sedimentation and erosion would be reduce or eliminated at stream crossings by minimizing the number of crossings, using crane mats and temporary bridges, and identifying optimal locations for the crossings. Silt fencing, fiber rolls, and/or wattles would also be used as needed to reduce sedimentation.

Direct effects would also potentially include a decrease in water quality in the powerline corridor as a result of any increase in sediment delivery into the ROW. Indirectly, this erosion could cause impairment for beneficial uses such as aquatic life and fisheries, indigenous aquatic life, primary contact (swimming), public and food processing water supply (drinking water), secondary contact, and aesthetic quality. Appropriate design criteria from Appendix A would be used to minimize and control sedimentation and erosion in the ROW.

A slurry mix would be used to drill holes for hybrid pole construction within specified wetland locations (see the Structures paragraph in the description of the Proposed Action above). The mix is an environmentally safe synthetic soil stabilizer in granular form. Ameren has indicated to us that “the slurry is comparatively clean to use. However, some slurry mix will get into the ground in normal course of drilling. The material is environmentally friendly and photo degrades in a few days” (Drilling Service Co. 2014). There should be no direct or indirect effects from the use of the slurry.

Cumulative Effects

Cumulative watershed effects are the estimated changes in watershed conditions that might occur as a result of implementing the proposed project when added to what has occurred in the recent past and what is expected in the foreseeable future. Watershed cumulative effects are best addressed on a watershed basis. Table 11 lists the spatial boundary considered in the cumulative effects analysis.

Table 11. Sixth field watersheds comprising the cumulative effects analysis area (CEA)

Watershed Name	Total acres	Federal acres	Non-federal acres	Percent Federal	Natural areas	National Natural Landmarks
Cave Creek – Cedar Creek	20,852	8,583	12,269	41.16	331	337
Cedar Lake – Cedar Creek	22,133	6,053	16,080	27.35	N/A	N/A
Fountain Bluff – Mississippi River	24,572	3,188	21,384	12.97	N/A	N/A
Grand Tower Island	2,291	111	2,180	4.85	N/A	N/A
Town Creek/ Big Muddy	36,243	18,737	17,506	51.70	1,001	662
Total (CEA)	106,091	36,672	69,419	34.57	1,332	999

The temporal boundary, or the time frame for considering cumulative effects, is 15 years. The 15-year time frame provides a good basis for measuring any change in soil disturbance due to soil erosion and soil compaction.

Physical evidence of past land uses shows that the soils in these sub-watersheds have been severely impacted as a result of normally occurring activities including timber harvesting (mostly on private lands), road use and maintenance, agricultural use, recreation, and other industrial uses. The soils continue to slowly recover from this disturbance. Any disturbance to the soil resource that removes the soil to bedrock starts the soil forming process over again. There are no activities proposed in this project that would have this effect. Past activities within the project area such as limited tree removal and the use and maintenance of access routes and ROW has, and will continue to, disturb and compact the soil surface and to some degree, the subsoil.

Specifically in the project area, soils have obviously been compacted as a result of decades of use and maintenance of the powerline ROW and those routes used to access the corridor. The existing level of compaction is expected to continue as a result of implementing the proposed action. Little, if any, new compaction should occur that would add to the overall cumulative impact. No other project activities are expected within the ROW in the foreseeable future other than routine maintenance; the area would be under permit specifically for use as a powerline corridor. Other routine activities in locations surrounding the ROW, for instance, in areas around the access routes and on private land, would be expected to continue into the future. These activities would include recreation use (including vehicle access on those access routes that would be open to such use, and on any adjacent roads and trails), some limited tree removal (hazard trees, blowdowns, firewood, harvesting on private lands), and road maintenance.

Cumulative impacts result from the incremental impact of the action when added to other past, present and reasonably foreseeable future actions. The following are on-going or planned projects around the cumulative effects analysis area that were considered for this analysis:

- Cedar Lake shoreline stabilization would reduce sedimentation in this water supply watershed. Ameren activities have increased erosion and sedimentation in this watershed.
- Open Lands Expansion project would increase ground vegetation and the accompanying root mass and decrease erosion.

- The Big Muddy project would improve gully stabilization in this ecosystem and improve wetland function.
- Oakwood Moist Soils Unit Mastication can be expected to both increase and decrease soil erosion and sedimentation.

Further monitoring of these projects will provide more information in the future on specific impacts.

Erosion and sedimentation are concerns that affect water quality in the cumulative effects area. As is the case for soil compaction, past and currently existing activities have and will continue to result in erosion and sedimentation where mitigation and best management practices have not been implemented. Sediment delivery and soil erosion potential is expected to produce an additional 4 to 5 tons of soil loss off the surface to the existing situation (see above, Direct and Indirect Effects). However, with implementation of the SNF Forest Plan standards and guidelines, the design criteria proposed in Appendix A, and the Illinois Best Management Practices, or BMPs (Holzmueller and Deizman, 2012), this additive amount would only result in an incrementally small amount of adverse impact to water quality, and to stream structure and function. The proposed activities would also correct the existing poor drainage and would result in a more sustainable system that in the long run would produce less erosion, and thus provide for some beneficial cumulative impact.

Private lands are expected to have continued timber harvesting and firewood cutting along with agricultural land uses and recreation activities in the foreseeable future. These activities are expected to have some level of continued impacts on the watersheds in the cumulative effects area and on private lands in the project area due to a potential increase in sedimentation and erosion. It is important to note that Ameren would be expected to implement Illinois BMPs on project work on private lands, and thus reduce adverse impacts. Therefore, the overall cumulative impact to soil and water resources would be minimal.

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Chapter 4 – List Of Preparers

The following Forest Service employees participated in development of the proposed action and/or preparation of the Ameren Powerline Reconstruction Project EA as primary members of the Interdisciplinary Team (IDT), or provided technical assistance and/or review of the EA.

Name	Title	Area of Responsibility
Tim Pohlman	District Ranger	Responsible Official
Amanda Kunzmann	Deputy District Ranger	Assist Responsible Official
Bob Bayer	IDT Leader, TEAMS	Interdisciplinary team (IDT) leader
Bob Monroe	IDT leader, SNF	Recreation, special uses
Richard Blume-Weaver	Planning/Resource Staff	Document and process oversight and review
Rod McClanahan	SNF Wildlife Biologist	Wildlife and threatened, endangered and sensitive species
Scott Reitz	TEAMS Wildlife Biologist	Wildlife and threatened, endangered and sensitive species; aquatic species
Beth Shimp	Botanist	Plants and threatened, endangered and sensitive species
Shannon Sharp	Botanist	Plants
Mary McCorvie	Heritage Program Manager	Heritage and cultural resources
Heather Carey	Archeologist	Heritage and cultural resources
Angela Kelley	Realty/Lands Specialist	Lands and special uses
John Depuy	Soil Scientist	Soil and water resources
Scott Crist	Fuels Specialist	Fuels and fire management concerns
Matt Lechner	NEPA Coordinator	NEPA and process oversight
Chris Bielecki	Roads Engineer, TEAMS Enterprise	Roads and transportation analysis
Janice Shultz	Writer/Editor, TEAMS Enterprise	Writer/Editor review
Jeremy Vaughn	GIS Coordinator	GIS work

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The following references were important to developing the Ameren Powerline Reconstruction Project proposed action and completing the analysis documented in this EA. This list includes all references from Specialist reports and biological evaluations, and is presented by resource area.

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Appendix A – Design Criteria

The following measures are summarized from discussion in Chapter 3 of the EA and are presented by resource area:

Access Routes and Transportation System

Note: Please see other resources areas for other specific measures that apply to access routes.

- Traffic control measures would be used as appropriate to provide for user and construction staff safety. Signing shall be in accordance with the Manual on Uniform Traffic Control Devices.
- Applicable National and State best management practices, Forest Plan standards and guidelines, and project design criteria would be used during implementation to minimize adverse effects to access routes related to soil compaction, erosion, and runoff.
    - Forest Service National BMPs: http://www.fs.fed.us/biology/resources/pubs/watershed/FS_National_Core_BMPs_April2012.pdf
    - Illinois BMPs: http://web.extension.illinois.edu/forestry/timber_harvest/forestry_bmps.html

Heritage and Cultural Resources

- Monitor to determine the effects, if any, of increased public use in regards to five potentially affected sites. If monitoring determines that sites are being affected by public users, the travel ways will be modified to avoid the impact.
- In consultation with the State Historic Preservation Officer, complete a section106 evaluation of the one site that cannot be avoided during project implementation to determine its eligibility for inclusion on the National Register of Historic Places (NRHP). If the site has poor physical integrity or does not have the ability to contribute significant information about the prehistory of the area, it will be determined to not to be eligible for inclusion on the NRHP, and further mitigation or monitoring will not be necessary. If the site does have the ability to contribute meaningful information about the prehistory of the area, further excavation and mitigation may be necessary to protect the archaeological material from potentially damaging project related work activities.

Botany

- Ensure that the long-term viability of rare plant resources is not threatened by mechanical treatments. Where threatened, endangered, or sensitive species cannot adapt to the mechanical disturbance or will have negative impacts to known populations, plants will be protected through the use of barriers and avoidance during project implementation.
- Ameren officials will work with the Forest Service Botanist to provide barriers to one population of *Dodecatheon frenchii* (French's shooting star) and one population of *cv Matelea obliqua* (Climbing milkweed) to avoid damaging or destroying these populations along FR 741A. Sites will be monitored to ensure avoidance.
- Follow Forest Plan standards and guides pertaining to washing equipment to prevent spread of NNIS.

Soil and Water Resources

- Operate equipment only when soils are dry enough, or frozen enough during winter season, to support equipment. Operations should cease before rutting becomes excessive (greater than about 8 inches in depth).

- Use of heavy equipment in wet areas should be avoided to the extent possible, as stated above, to avoid excessive rutting. These wet areas are most likely associated with structure numbers 21 through 45; 53, 57, 58, 60 through 63; 65 through 69; 75 through 78; 85, and 86. Postpone work in such areas until ground conditions improve. As necessary, use construction matting and low ground pressure equipment to minimize impacts.
- Areas of exposed soil shall be leveled, seeded and mulched. Seeding, seeding mixtures, and fertilizer requirements are specified in the SNF Forest Plan on pages 208-212. Ameren and its agents shall work closely with the Forest Service to ensure that correct seeding protocols are followed. Native plant seed mixtures provided by IDNR are also acceptable.
- Seeding and mulching shall be employed to establish ground cover according to Forest Service specifications to reduce erosion and provide cover over disturbed areas while plants are germinating.
- To the extent possible, avoid equipment maintenance and fueling in areas with hydric soil. Hydric soils are associated with structure locations 21 through 45, 66, 67, 75, 77, 78, and 85.
- All refueling operations shall use the following guidelines from the Illinois BMP manual. Ameren shall include the following direction in their Spill Prevention Plan. The Plan will be incorporated into the special use permit O&M plan.

Handling fuels, lubricants, and waste in the field:

- Maintain equipment regularly. Check hoses and fittings daily to prevent leaks or spills.
- Designate specific areas for equipment maintenance and fueling. Locate these areas on level terrain, a minimum of 100 feet from all streams and lakes.
- Collect all waste lubricants, containers and trash. Store them in leak-proof containers until they can be transported off-site for recycling, reuse, or disposal at an approved site. Note that it is illegal to dump fuel, lubricants, and used oil on the roads, land, or waters in Illinois.
- Separate all fluids and materials and keep in different labeled containers to avoid creating "hazardous waste" and expensive waste disposal.

Spills:

- Equipment should be properly maintained to prevent spills.
- Maintain a spill-containment and cleanup kit appropriate for the materials on the operation. At a minimum, a kit for petroleum products should include:
    - Plugs and clamps to control a hydraulic line break.
    - A container to catch leaking fluid.
    - A shovel to be used to construct any necessary containment structures.
    - Absorbent material such as sawdust to absorb fluid, especially useful in the winter when soil is frozen.

If a spill should occur, do the following in order:

- Protect yourself and others. Wear protective clothing and equipment appropriate for any hazardous materials on the operation. Avoid coming in contact with any toxic drift or fumes that may be released.
- Stop the leak and attempt to control the spill.

  - Attempt to contain the spill and keep it from spreading. Shovel a dike around the spill. Use absorbent material, such as sawdust or loose soil, to soak up fluid. Place a bucket under a hydraulic hose break. Prevent the spill from flowing into lakes or streams.
  - Isolate the spill material.
- Keep construction equipment out of stream channels and employ crane mats, temporary bridges or equivalent for perennial or intermittent streams. Minimize the number of stream crossings and make crossings at right angles to stream channels. Forest Service specialists will work with Ameren and its agents to identify appropriate stream crossings.
- Silt fencing, fiber rolls, and/or wattles shall be used as needed to reduce sedimentation and erosion at stream crossings.
- Work on levees shall be monitored. Rock shall be placed in extremely soft areas. Repairs shall be made during replacement activities and permanent repairs shall take place once the work has been completed.
- Water bars shall be constructed for erosion protection for outflows from road drainage structures to minimize erosion and disperse the water. Use the table below as a guide.

Grade of Road (Percent)	Distance Between Water Bars (Feet)
1	400
2	250
5	130
10	80
15	50
20	45
25+	40

- Soil or other material stockpiles shall not be kept less than 25 feet from roadways, ditches, creeks, streams, sinkholes, and wetlands.

Site restoration design features for soil and water resources:

- Unless otherwise directed in the Storm Water Pollution Prevention Plan (SWPPP), final grading shall be completed and broadcast temporary (annual) seed and permanent (perennial) seed shall be applied as soon as possible after the large disturbance activities are complete.
- Agricultural fields or pasture areas shall not be seeded without permission from Ameren.
- Final seeding will include the preparation of a proper seedbed. The site will be tilled two to four inches depth of loose friable soil. As needed, the soil may be tested to determine the best procedure and materials. Seeding, seeding mixtures, and fertilizer will be done as directed in the SNF Forest Plan on pages 208-212.

Wildlife and Aquatic Species

While the following measures are designed to reduce impacts, harm or harassment to individuals may still occur and implementation does not exempt Ameren from compliance with state laws and regulations. Also, the Illinois DNR may pose additional conditions to which Ameren must comply

Forest Dwelling Bats:

- All standing or leaning dead or alive trees greater than five inches diameter at breast height (dbh) that are suitable bat roost trees will be retained unless removal is necessary for human safety or to accomplish project objectives (e.g. new road construction). If a suitable bat roost tree must be cut, it would not be removed between April 1 and November 15 unless it is evaluated and/or surveyed to confirm non-use by roosting bats and documented in a biological evaluation. The evaluation and determination of non-use by roosting bats must be conducted by a person able to demonstrate to the Forest Service that they have the necessary skills and experience to evaluate suitable Indiana bat roost trees and to conduct appropriate surveys.
- Suitable bat roost trees are defined as follows: standing or leaning hardwood or conifer trees that are alive or dead, greater than five inches dbh and have any of the following features: broken tops greater than five inches dbh, dead trunks greater than five inches dbh in multi-trunked trees, dead limbs greater than five inches dbh, sloughing bark, cavities, cracks, splits, crevices, or knot holes.

Timber Rattlesnake:

- When soil conditions are such that rutting can be minimized, construction should occur during the denning season, or between November 15 and April 1. When construction for pole replacement occurs outside this period, the following shall be implemented:
    - A team of qualified individuals shall be used to identify and relocate snakes that are found within or immediately adjacent to work locations. Crews shall check for snakes daily as they move in and out of work locations or more often if moving from one location to the next.
    - Equipment operators and drivers shall be on the lookout for rattlesnakes on the road as they travel to and from the ROW. Retain a driving speed of 15 mph or less and move snakes if necessary.
    - Crews and equipment must remain on access roads within the ROW corridor when moving from pole to pole to minimize the likelihood of snakes being run over.
- In order to reduce the likelihood that a snake would be harmed during maintenance and mowing of the ROW, activities shall be conducted as follows:
    - Within core habitat (see Figure A- 1), use of mechanized equipment will be restricted to the denning period, which is November 15 and April 1.
    - Within occupied habitat (see Figure A- 1), use of mechanized equipment will only occur between November 15 and April 1, or June 1 to August 15.
- During emergency maintenance operations, attempt, as practical, to relocate individual snakes that would be endangered by emergency repairs.

Bald Eagle:

- Disturbance is prohibited within 300 feet of each occupied eagle nest and consultation with the Fish and Wildlife Service is required prior to removal of inactive nests.
- Significant changes in the landscape are prohibited within 600 feet of an occupied eagle nest.
- Management activities that could result in adverse disturbance to nesting birds shall be restricted within 1,300 feet of an eagle nest during the nesting period.
- There are no known nests within 1,320 feet of proposed activities. Should a new nest be identified, the USFWS shall be contacted and restrictions or mitigations identified if necessary.

Migratory Wildlife:

- To reduce the likelihood of harm to migratory birds of concern, construction within the Cave Valley Bird Area shall occur outside the primary nesting season, which is April 1 through July 15.
- If an active hawk or owl nest is identified during project implementation, the nest tree shall be retained. A Forest biologist should be contacted to identify the species affected and if necessary, prescribe mitigation measures. No active nest trees shall be removed between April 1 and August 31, unless it poses a safety hazard.
- All powerline construction, maintenance and monitoring shall be consistent with the Fish and Wildlife Service Avian Protection Plan (USDI FWS 2005b).

Wetland Dependent Wildlife:

- When soil disturbing work occurs near wetlands, silt fences shall be installed to prevent sediment from reaching streams, vernal ponds and wetlands.
- When travelling through wetlands, vehicles shall stay on established roads and crossings. Any new roads shall be constructed with culverts and directional funnels (e.g. silt fences) to prevent roads from becoming barriers limiting access, and to reduce the likelihood of mortality to wetland dependent wildlife.

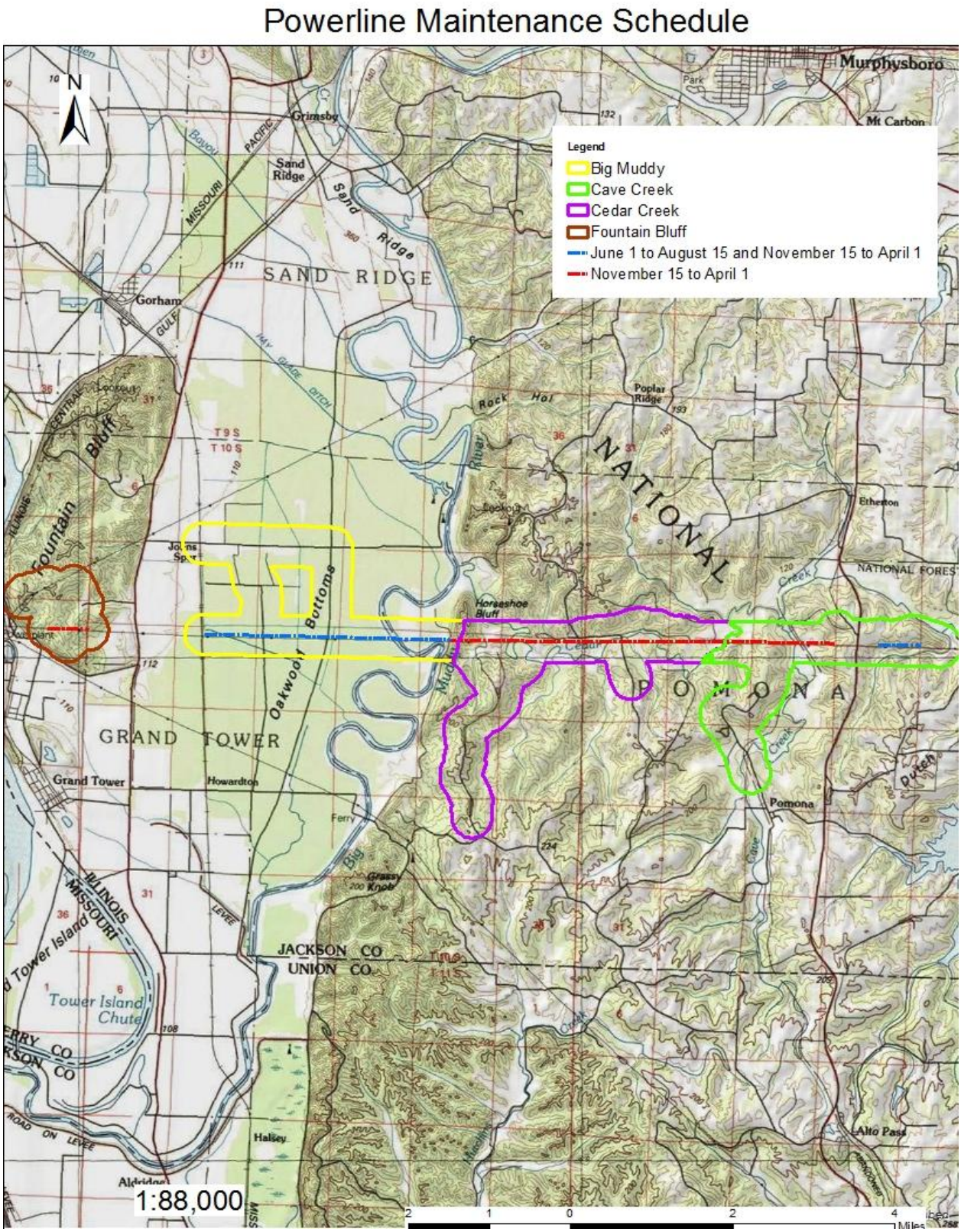
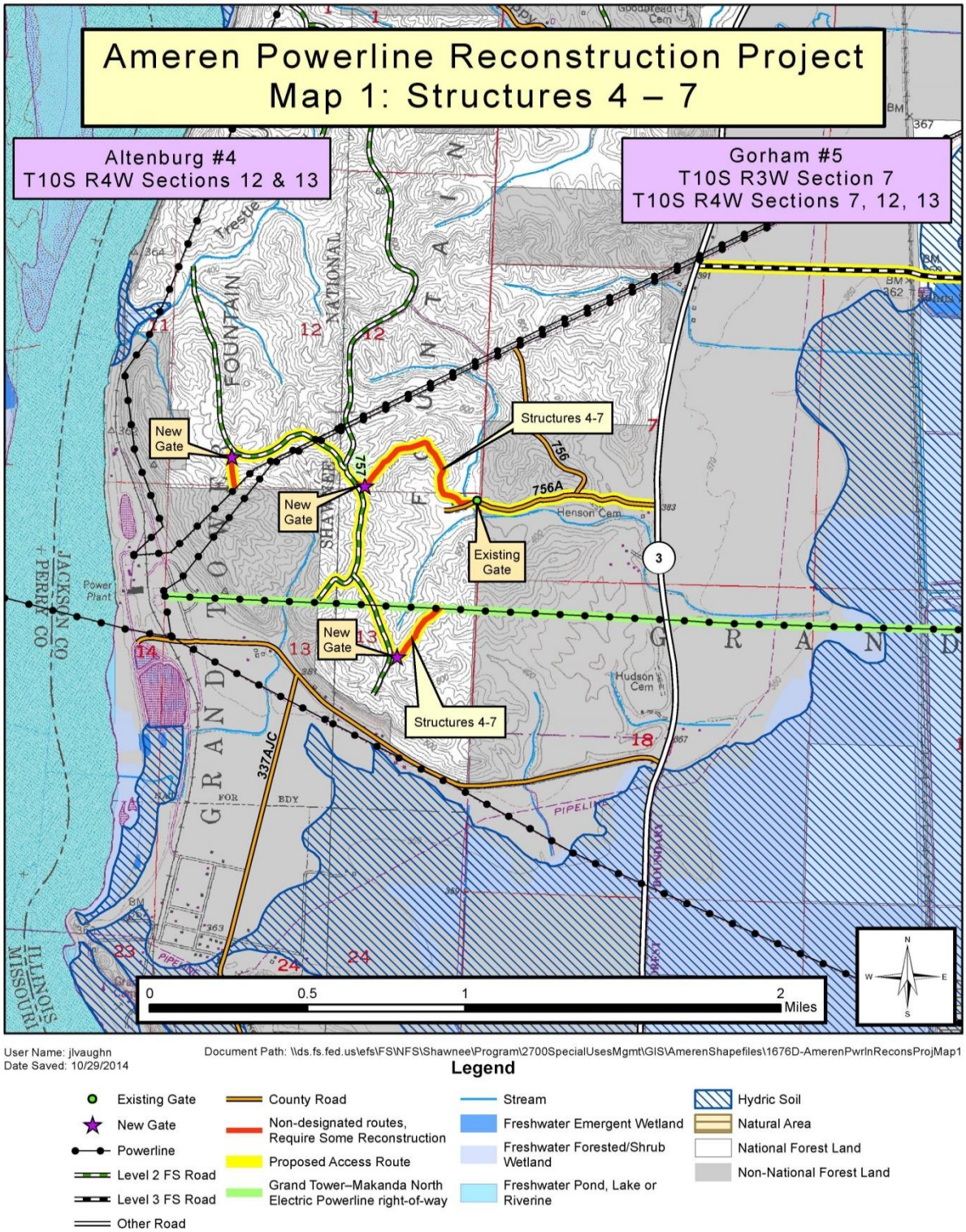


Figure A- 1. Powerline row maintenance map for design criteria

Appendix B – Project Maps



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Legend

- Existing Gate
- New Gate
- Powerline
- Level 2 FS Road
- Level 3 FS Road
- Other Road
- County Road
- Non-designated routes, Require Some Reconstruction
- Proposed Access Route
- Grand Tower–Makanda North Electric Powerline right-of-way
- Stream
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond, Lake or Riverine
- Hydric Soil
- Natural Area
- National Forest Land
- Non-National Forest Land

Figure B- 1. Map 1, Structures 4-7

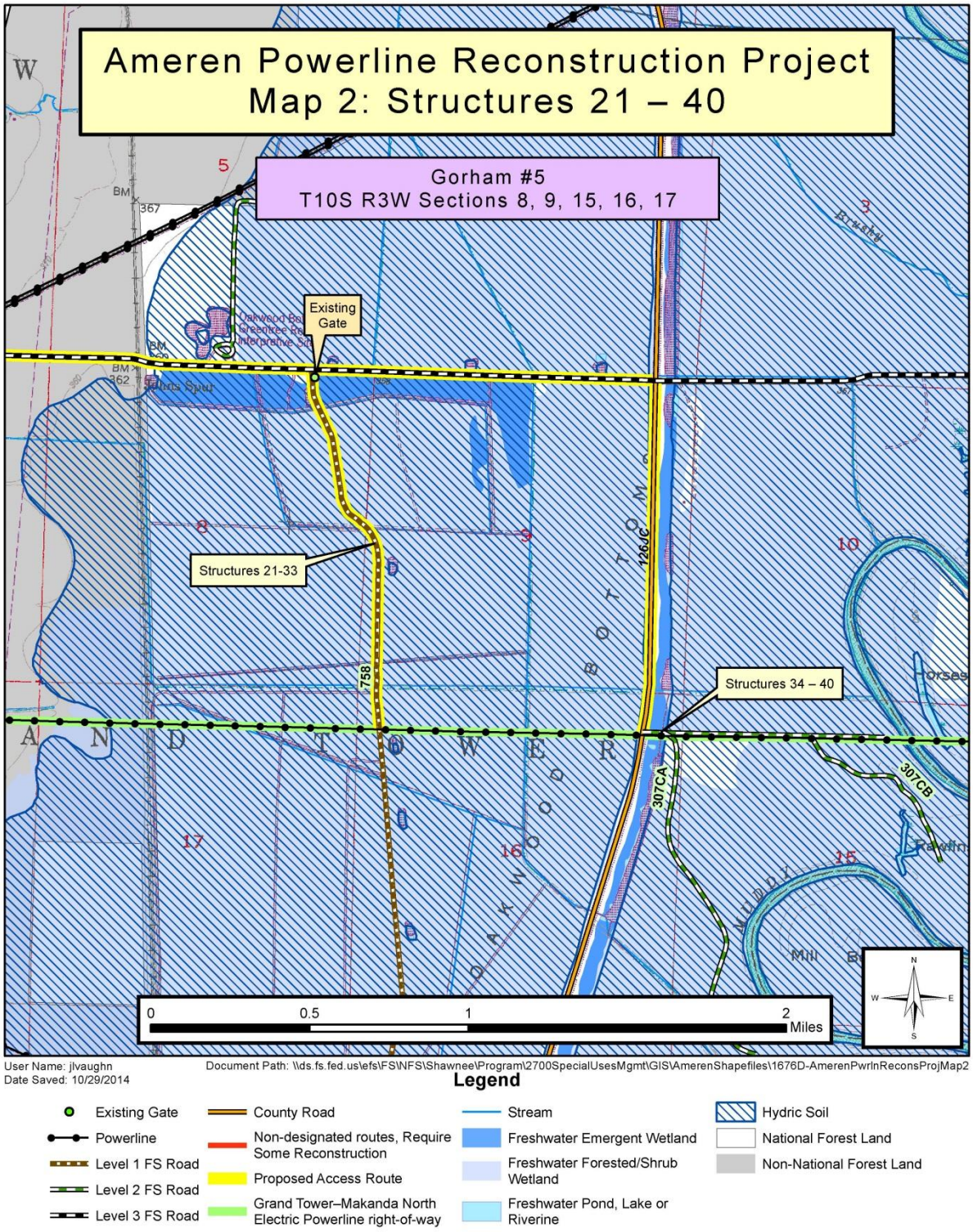

Figure B- 2. Map 2, Structures 21-40

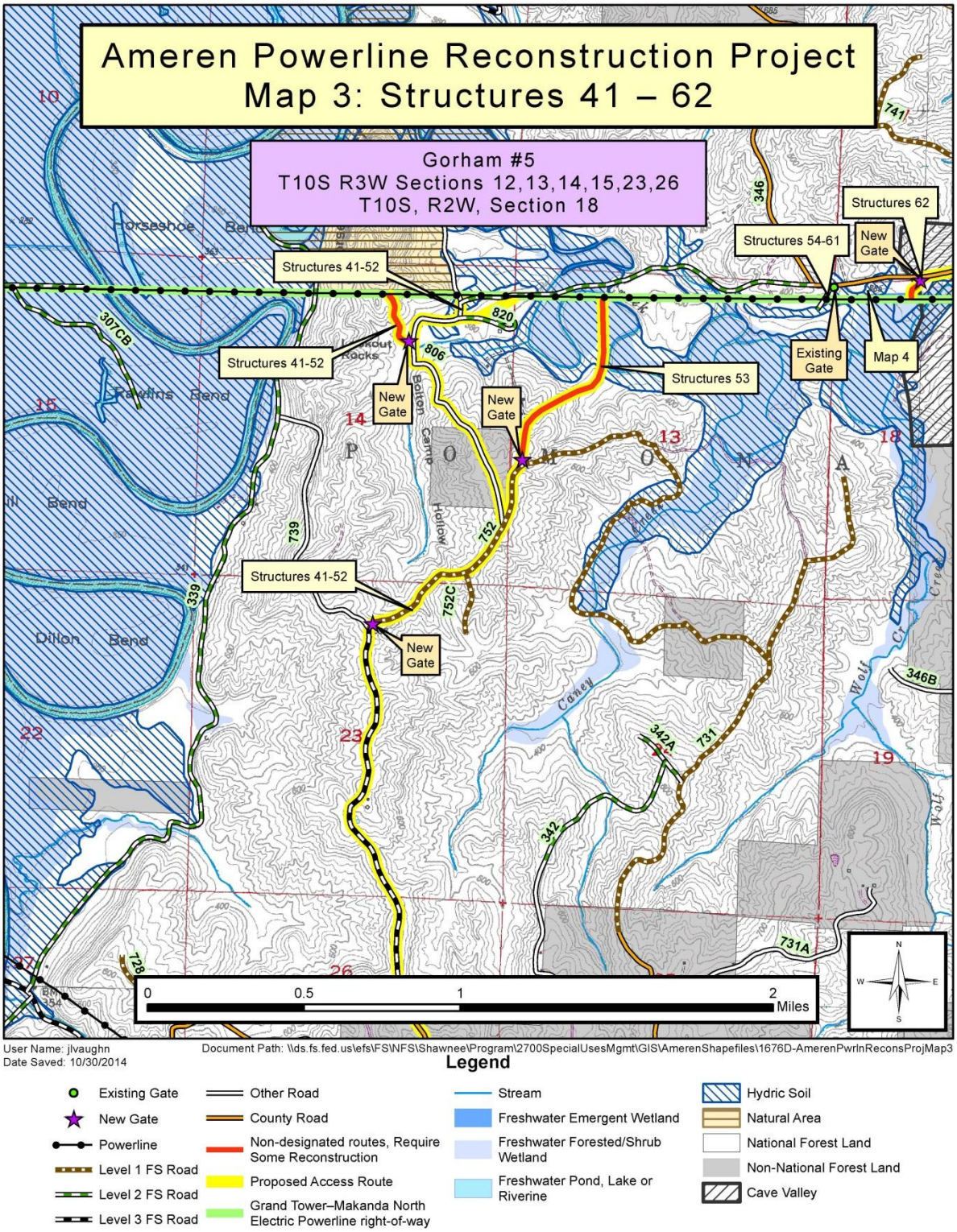

Figure B- 3. Map 3, Structures 41-62

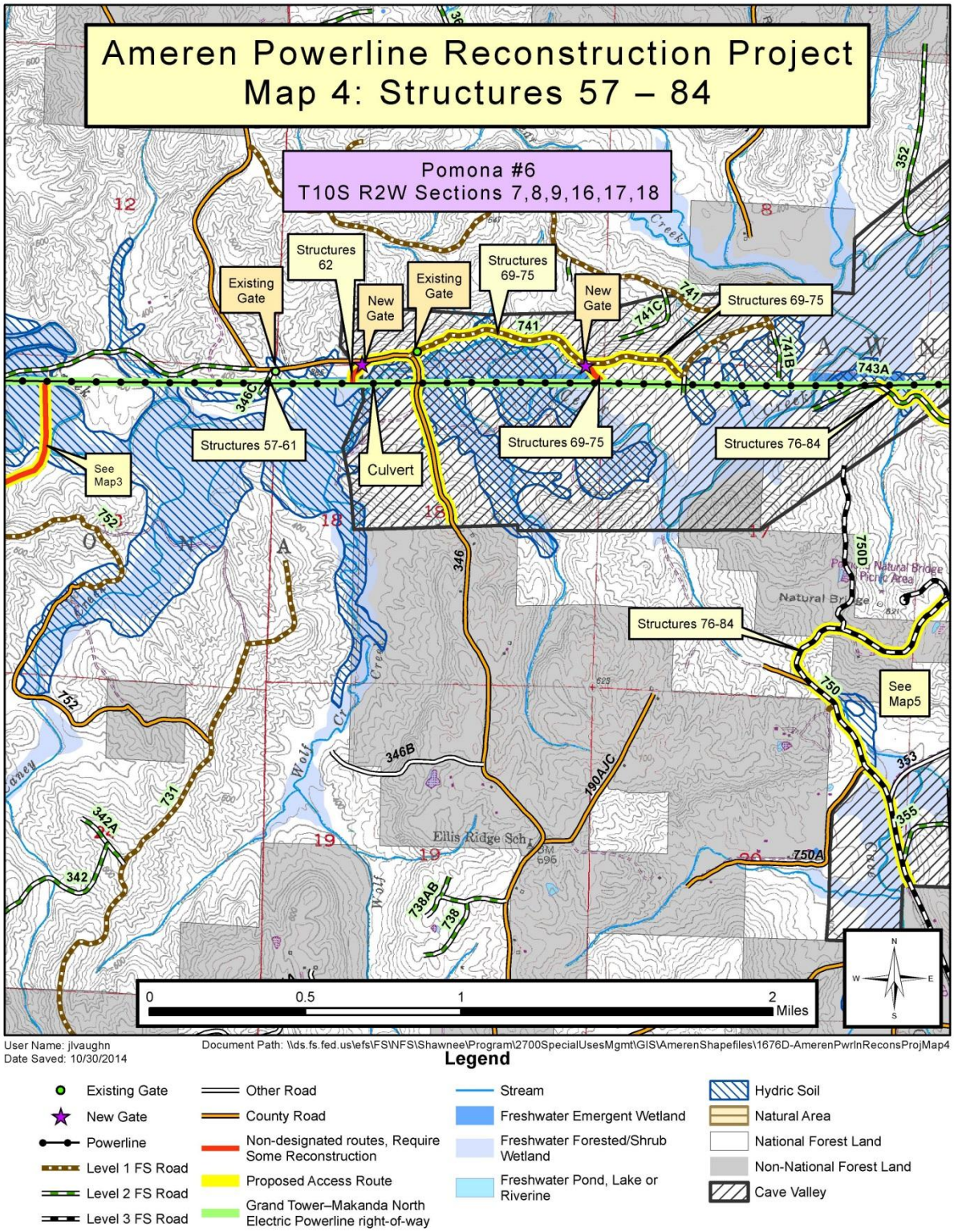

Figure B- 4. Map 4, Structures 57-84

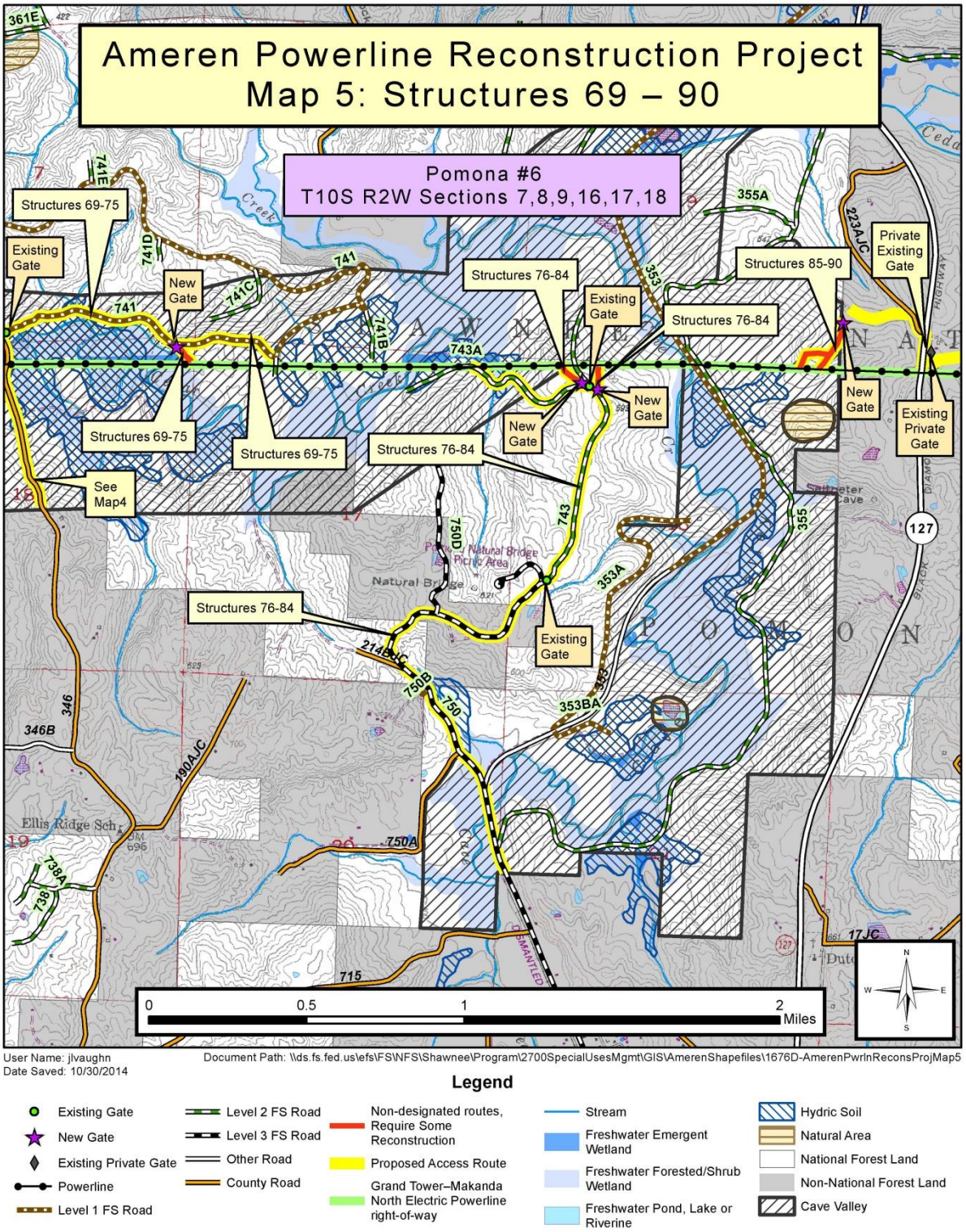

Figure B- 5. Map 5, Structures 69-90

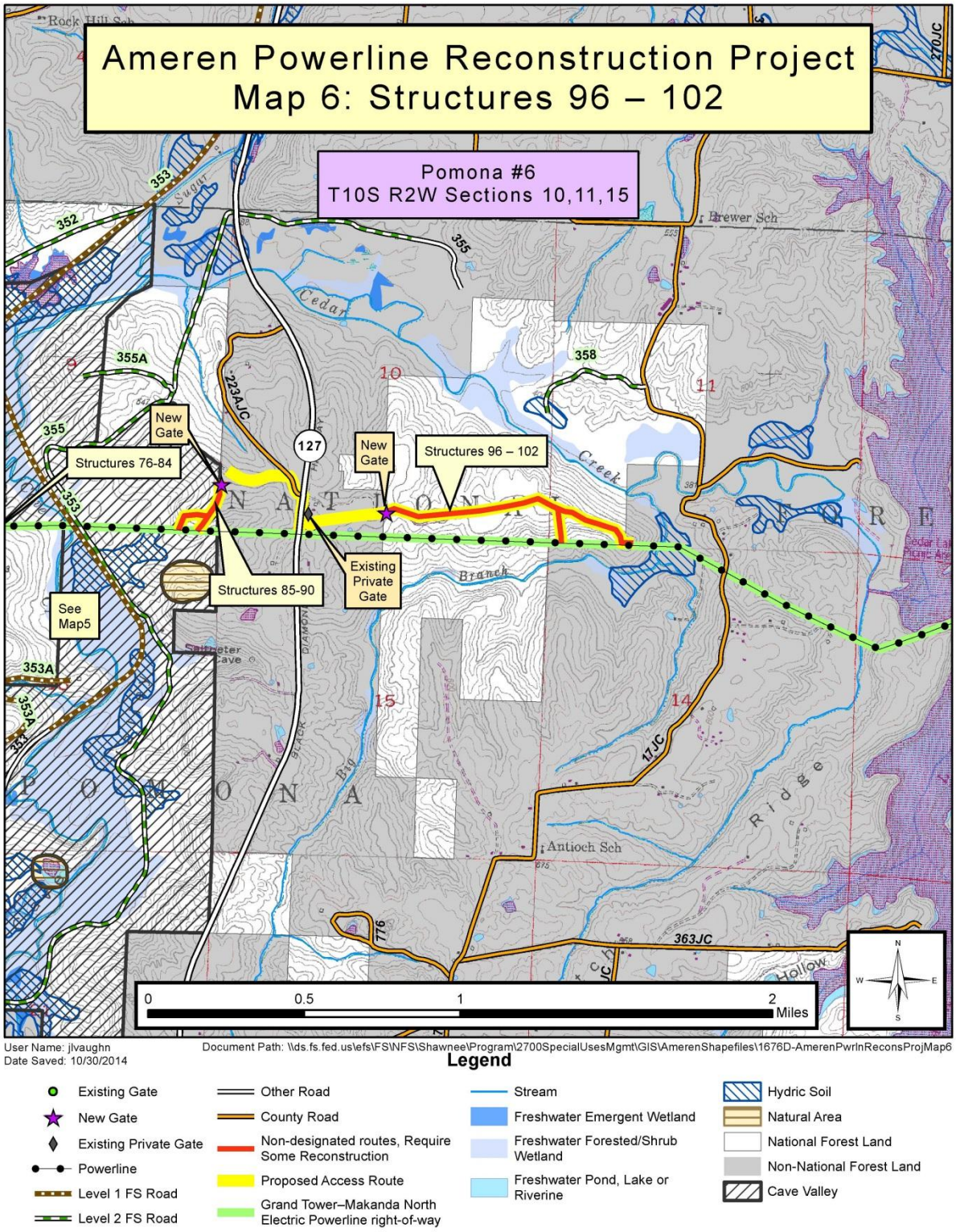

Figure B- 6. Map 6, Structures 96-102