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Environmental Assessment

Southwestern Power Administration
Utility Corridor and Tower Site
Vegetation Management

Pope and Searcy Counties, Arkansas
Ozark-St. Francis National Forest
Big Piney Ranger District

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Chapter I

Purpose and Need for Action

This chapter describes the project location, the purpose and need for action, and proposed action. This chapter also references direction in the Revised Land Resource Management Plan (RLRMP) and includes decisions to be made as well as other issues, concerns and opportunities.

A. Location of Project Area

The Southwestern Power Administration's Project area contains portions of the following townships, ranges, and sections for the overhead transmission line:

Township 10 North, Range 20 West, Sections 2, 3 & 8-10
Township 11 North, Range 20 West, Sections 35 & 36
Township 11 North, Range 19 West, Sections 1, 11, 12, 14, 22, 23, 27, 28, & 31-33
Township 12 North, Range 19 West, Sections 24, 35 & 36
Township 12 North, Range 18 West, Sections 4, 5, 8 & 17-19
Township 13 North, Range 18 West, Sections 27, 33 & 34

Communication Site is:

Township 10 North, Range 18 West, Sections 22

The Southwestern Power Administration's (SWPA) Project area is a 100-foot wide Right of Way (ROW) for an overhead high power transmission line which enters the National Forest approximately two miles south of the Long Pool Recreation Area and runs generally to the northeast for a length of 20.5 miles exiting the National Forest approximately two miles southwest of the community of Witts Springs. Additionally, SWPA has a communications tower located at the White Oak Mountain Communication Site (FS Road # 1301) approximately seven miles northeast of the town of Hector that requires vegetation management.

B. Purpose and Need

The primary developmental forces for this project are as follows:
Currently, SWPA's Special Use Permit allows vegetation control through the use of special types of heavy equipment and mechanical tools (chainsaws, brush cutters, etc.) within the permit areas. This type of maintenance occurs every three years at a minimum. The purpose of this project proposal is to provide a safer work environment for SWPA's employees and their contractors by decreasing exposure (risk) to heavy equipment operation while performing vegetation control within SWPA's two permit areas on the Big Piney Ranger District. Terrain and location of approximately 70% of one permit area (the ROW) makes it accessible primarily by foot or special type of heavy equipment, this increases response time needed for rescue if personnel become injured while working in these areas.

- The need to provide a safer working environment for SWPA's employees and their contractors that maintains the (ROW).
- The need to reduce use of heavy mechanized equipment and thereby lessen its impact
- The need to make control of vegetation within the transmission line ROWs more cost effective.
- The need for effectively reducing Non-Native Invasive Species (NNIS) in the ROW

Populations of (NNIS) plants have been documented within SWPA's permit areas through inspections and inventories. If left uncontrolled/untreated, these populations could spread to adjacent areas.

1.) Management Areas:
The Revised Land and Management Plan (RLRMP or Forest Plan) for the Ozark-St. Francis National Forests describes Desired Conditions for the Management Areas (MAs) and the ecological systems that occur within these MAs. The following describes the applicable desired conditions of the Management Areas that occur within this proposed project area:

MA 3E High Quality Forest Products – 6.55 miles (79 acres) 32% of the project area. The lands in this MA support a balanced age class distribution of forest stands containing native tree species capable of sustained, high-value timber production. Tree growth rates and vigor are high. Incidence of insect and disease outbreaks is low. The landscape character is naturally appearing with mixtures of hardwood, mixed hardwood/pine, pine/hardwood, and pine forest communities. Management activities may be visually evident in portions of these areas. Evidence of management activity may include active timber harvest operations, tree stumps, temporary roads, skid trails, and log landings. Layout of timber sale boundaries, retention of individual trees, clumps of trees, and seeding of exposed soil reduce visual impacts. High quality, well-maintained roads through the MA are designed to facilitate timber removal and protect water quality. Designated roads through the area also provide recreation opportunities for OHV and passenger-vehicle travel. These areas provide a variety of motorized and non-motorized recreation opportunities including hunting, fishing, hiking, bicycling, berry picking, dispersed camping, driving for pleasure, and viewing scenery and wildlife.

MA 3B Oak Woodland – 5.89 miles (71 acres) 29% of the project area. The desired future condition is an area characterized by a mosaic of woodland and forest with oak woodland occupying approximately 60% of xeric and dry sites. Patches of oak woodland are well connected incorporating other fire dependent communities such as glades. Oak woodlands have open canopies (10-60% canopy closure), sparse mid-stories, and well developed understories dominated by grasses and forbs. Evidence of fire is common and results in a variety of vegetation conditions across the landscape. The abundance of oak woodlands provides optimal habitat for many indicator and rare species, and species in demand for hunting such as wild turkey and whitetail deer. Where rare communities are present, they support healthy populations of associated species and are free from threats that would degrade their integrity.

MA 3C Mixed Forest – 4.35 miles (53 acres) 21% of the project area. The desired character of this MA is predominately natural appearing forest with diverse successional classes and ecological community types. Thinning, prescribed fire at regular intervals and regeneration harvests are common silvicultural treatments to reduce stress as trees age. Pine and oak woodlands are found throughout the area. Late–successional to old growth characteristics are provided on suitable lands within this area. Other communities such as glades comprise a small portion of the area and exhibit high levels of ecological integrity and diversity of characteristic species. Rare communities within the management area are maintained. While the landscape character will appear natural, the management activities are visually evident and may on occasion dominate the natural landscape.

MA 3D Oak Decline Restoration Areas - 1.59 miles (19 acres) 7.7% of the project area. These are areas where red and white oak trees suffered severe mortality due to general oak decline, insect outbreaks and disease. Fuel loading in these areas is high and wildlife mast reduction is greatly reduced. The desired future condition is to have a well-balanced age class scattered over the landscape. Prescribed fire every 3-7 years will effectively release the existing oak seedlings on much of the area. Oak planting may occur where no existing advanced regeneration is present. A series of regular thinning maintains quality oaks in a stress-free environment. This thinning will also help prevent serious outbreaks of pathogens. Rare communities and associated species continue to exist in the area including disturbance dependent communities requiring active management. The conditions are suitable for wild turkey and whitetail deer. The landscape character is of a forest with closed over-story canopies except where thinned to promote oak regeneration. Herbaceous vegetation is created through repeated prescribed fire. In order to balance age classes and to prevent the recurrence of an over mature landscape regeneration, harvests are prescribed in this management area.

MA 1H Scenic Byway Corridors - 1.39 miles (17 acres) 7% of the project area. (Hwy 123 and Hwy 7) These areas are characterized by a predominance of mid- and late-successional forests. Forest structure varies according to ecological factors, but largely consists of a mature over-story; a fairly open mid-story; and a well-developed herbaceous and shrubby understory. Understory vegetation includes a variety of native deciduous and evergreen flowering trees, shrubs, and wildflowers. Even-aged, two-aged, and uneven-aged forest communities along with medium and small patches of late successional to old-growth forest communities continue to develop throughout the area. Exceptional opportunities for motorized recreation, especially scenic driving exists in this MA. The views along the different byways vary, and include a

variety of landscape characters, ranging from natural appearing to pastoral, historic, and cultural. They provide colorful accents and interesting textures, which change with the seasons. Road corridor improvements and interpretive facilities are evident changes to the natural environment. These man-made alterations fit well with the character of the surrounding landscape. Other management activities are not evident to the average visitor.

Vegetation is influenced both by natural processes and humans. Biological communities are maintained or improved to provide an attractive setting for visitors while providing for the protection of rare communities and threatened, endangered, sensitive, and locally rare species. Forest management activities maintain the natural characteristics that make the area scenic. Commercial timber harvest is appropriate to maintain the long-term goals of a diverse and vigorous forest with sensitivity to dispersed recreation and scenic values. Timber harvesting operations focus on what is retained in the stand, not on wood fiber production. Timber harvest practices are visually subordinate to the surrounding landscape. The MA is suitable for timber production. Prescribed fire and other management treatments are appropriate vegetative management tools available to be used to enhance the byway corridors in conjunction with other resource values.

MA 1D Recommended Wild and Scenic Rivers – (6/10) of a mile (7.5 acres) 2.6% of the project area. The North Fork of the Illinois Bayou is recommended as part of the Wild and Scenic River System. The river is 22.6 miles long, and is classified as scenic; a one-quarter (1/4) mile buffer is managed under the same conditions as the scenic section of MA1.C. The scenic integrity objective is high for all inventoried scenic classes. Permits will not be issued for activities on National Forest lands that are inconsistent with the management goals for the river corridor.

No management activities will be proposed that may compromise the outstandingly remarkable value(s), potential classification, or free- flowing character until designated or released from consideration.

MA 3I Riparian Corridors - 13 miles (2 acres) less than 1% of the project area. This management area is identified based on landform, vegetation, soils, and hydrology characteristics of the landscape. They are managed to retain, restore, and enhance the inherent ecological processes and functions of the components within the corridors. The desired condition for these areas reflects function and value. The vegetative communities, predominately forest, are productive and diverse providing for a rich variety of organisms and habitat types. Timber and vegetation (dead and alive) have the appropriate structure needed to provide shade, food, shelter, and microclimate for riparian-associated flora and fauna, especially threatened, endangered, sensitive (TES) and locally rare species. Prescribed fire may be used within the corridor to create or maintain the composition and vitality of fire-dependent vegetative communities (e.g., canebrakes). Management activities take place to provide diversity and complexity of native vegetation; rehabilitate both natural and human caused disturbances; provide for visitor safety; or accommodate appropriate recreational uses.

The Communication site is one acre of land in MA 3C Mixed Forest

Private land is 3.23 miles or 13.5% within the project area. The proposal **excludes** private land. This EA did not include the private land portion of the ROW in its analysis.

2.) Areas of Concern or Special Emphasis identified by Leadership:
Former Forest Service Chief, Dale Bosworth delineated four threats to the health of the National Forest and Grassland system and subsequent Chiefs have emphasized other concerns. Where opportunity exists, this EA will attempt to address these issues within the project area. The identified concerns include:

Fire and Fuels: The natural role of fire has been withheld from the National Forests for many years. Research shows that National Forest System (NFS) areas at high risk from wildland fire and ecological degradation (Class 3) come to 51 million acres, or 26 percent of the NFS. Areas at moderate risk (Class 2) amount to 80.5 million acres, or 41 percent. Areas currently within their historical range (Class 1) come to 65 million acres, or 33 percent. On the NFS, 73 million acres in Classes 2 and 3 were identified as the highest priority for fuels reduction and ecosystem restoration treatments. Treatments to reduce fuels and restore ecosystems involve various techniques, including thinning, prescribed burning, and clearing forest debris.

Invasive Species: Invasive species are major threats to our Nation's aquatic and terrestrial ecosystems. Invasives destroy fish and wildlife habitats, alter nutrient cycling and natural fire regimes, and can reduce biodiversity and degrade native ecosystem health. Invasive aquatic species pose a significant risk to the 220,000 miles of streams, over 2 million acres of lake, and 15,000 miles of coastline cross the National Forest System. There are more invasive species per unit of aquatic eco-systems than in terrestrial ecosystems. All invasives combined cost Americans more than $137 billion a year in total economic damages and associated control costs. Infestations of invasive plants have reached epidemic proportions, spreading rapidly over hundreds of millions of acres, across all landscapes and ownerships. Invasive forest diseases, such as Chestnut Blight, wiped out entire forest species in the East (i.e., the American Chestnut) and Dutch Elm disease virtually eliminated an urban forest tree-the American Elm. Invasive species have been found distributed throughout the project area. There is a need to conserve the native biological diversity of plant communities, species and populations. It is necessary to prevent the displacement of native species and the disruption of plant communities through the introduction of aggressive, persistent, self-replicating, long lasting non-native vegetation into managed or natural plant communities.

Loss of Open Space: America is losing important working forests and rangelands to development across the Nation at a rate of more than 3 acres a minute. Loss of open space (1) affects our air, water and vegetation, (2) degrades wildlife habitat, and (3) reduces outdoor based economic opportunities. Loss of open space is a result of the division of forested landscapes into smaller, more isolated patches. This is of concern because it poses a threat to the health, sustainability, and viability of ecosystems and rural communities, and impacts biodiversity.

Unmanaged Recreation: The number of off-highway vehicle (OHV) users has climbed seven fold in the past 30 years, from approximately 5 million in 1972 to 36 million in 2000. Unmanaged OHV use has resulted in unplanned roads and trails, erosion, watershed and

habitat degradation, and impacts to cultural resource sites. Compaction and erosion are the primary effects of OHV use on soils. Riparian areas and dependent species are particularly vulnerable to OHV use. Studies indicate that the survival and reproduction of some wildlife species may be affected by excessive noise and disturbance. Local forest designation of roads, trails, and areas for OHV use provides forest visitors with opportunities to enjoy recreation experiences while protecting natural and cultural resources. Use of OHVs in the national forests is addressed through the forest plans or through separate access and travel management plans. Management of OHV impacts includes use of designated roads, trails, and areas for recreation; closure of sensitive areas; user education; enforcement; and use monitoring. Within the project area, there is a need to protect resources by providing better management of OHV roads and trails as well as a need to provide for recreational opportunities.

3.) Other Developmental Forces:
Protection of watersheds was one of the driving forces behind the establishment of the National Forests, and, as human populations increase, both the quality and quantity of water itself become more important. Development that permanently removes forest cover can impact both by increasing sedimentation and/or speeding runoff and reducing groundwater recharge.

RLRMP objectives that support the need of this project:

1) Across all community types, maintain a range of 3.8 to 6.8 percent of the total forest and woodland acreage in regeneration forest conditions (0-10 years old). (RLRMP page 2.10)
2) Treat at least 200 acres per year for reduction or elimination of non-native, invasive species. (RLRMP page 2.12)
3) Improve and maintain bobwhite quail habitat on 5,000 acres per year for the first decade. (RLRMP page 2.13)
4) Improve and maintain habitat for whitetail deer on 10,000 acres per year for the first decade. (RLRMP page 2.13)
5) Improve and maintain habitat for eastern wild turkey on 10,000 acres per year for the first decade. (RLRMP page 2.13)
6) Evaluate historic sites for appropriate management. Develop site management plans for noteworthy heritage resources wherever they occur. (RLRMP page 2.21)
7) Treat up to 300 acres per decade to meet the habitat needs of riparian area species groups. (RLRMP page 2.76)

C. The Proposed Action (PA)
The Proposed Action is to amend SWPA's existing Special Use Permits to allow the use of selected herbicides and adjuvants to treat woody stem vegetation and any type of NNIS within the Transmission Line #3001 ROW and the Communication Site on White Oak Mountain on National Forest lands. The Proposed Action would integrate herbicide treatment with current mechanical vegetation management practices. This would be accomplished through manual, hand-application methods (i.e., backpack spraying). No motorized or boom mounted applications would be approved.

D. Objective of the Proposed Action

- Create a safer work environment for SWPA's employees and their contractors which maintain the ROWs. SWPA would not have to perform vegetation control within their permit areas as often. This would increase safety of their employees and contractors by lessening exposure to hazards associated with the use of heavy mechanized equipment.
- Reduce the need to use heavy equipment to control vegetation within the ROW and communication site.
- Be more cost effective for SWPA in the future by reducing the number of times vegetation control would be required. SWPA would have an option for controlling documented populations of non-native invasive species within the ROW and at the communication site.

E. Related Documents That Influence the Scope of This Proposed Action

Vegetation management may include the use of manual, chemical, and mechanical treatments of plants in the service of ecosystem management objectives. The Final Environmental Impact Statement for the Forests compares and analyzes the impacts of a variety of treatments in the RLRMP (pages 1.18-1.49). This EA tiers to the following documents:

- The Revised Land Resource Management Plan and accompanying Environmental Impact Statement for the Ozark St Francis National Forests (2005)
- The EA/FONSI and accompanying documents for the High Mountain Project
- The EA/FONSI and accompanying documents for the Bearcat Hollow Phase II Project
- The EA/FONSI and accompanying documents for the Sugartree Project
- Region 8 Scenery Treatment Guide (2008)
- Herbicide Risk Assessments for glyphosate, imazapyr, metsulfuron methyl, and triclopyr as found within the following website: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml

The Revised Land and Resource Management Plan (RLRMP) identifies Forest-Wide Standards (pages 3.1-3.21) and MA Standards (pages 3.22-3.38) that will be applied to all methods of vegetation management. This direction is incorporated into this EA's design criteria.

F. Issues Eliminated From Further Study

These issues were identified through scoping and are addressed, but are not considered as "issues studied in detail". The following are the reasons for which they were eliminated from further study.

Jurisdictional Wetlands- Analysis conducted by district personnel has concluded that there are no documented jurisdictional wetlands within or adjacent to the project area, however, there may be small (non-jurisdictional) wetlands associated with streams. If wetlands are encountered during project implementation, the implementation would cease and the forest hydrologist would be consulted.

Civil Rights and Minority Groups- The proposed actions would impact minority groups in the same manner as all other groups in society. The proposed actions would not violate the civil rights of consumers or minority groups.

G. Issues Studied in Detail

To help develop the "issues studied in detail" necessary to focus the analysis, the Interdisciplinary Team (IDT) sought comments from within the agency, the general public, adjacent landowners, other agencies, and Tribal governments (See Appendix C for further details). This process led to the identification and development of "issues studied in detail" to be addressed in the subsequent analysis. The issue studied in detail is:

1.) **Herbicide Use**
Herbicide use has been identified as an important issue with the public. For this reason a "no herbicide use" alternative has been studied and included. The environmental consequences of herbicide use are disclosed throughout Chapter 3.

H. Other Concerns and Relevant Effects

Soil Productivity- There is a concern that the use of herbicides within this ROW may cause unacceptable levels of erosion, sedimentation, compaction, and/or nutrient loss and, as a result, a decrease in long-term soil productivity within the Project Area. *Source: ID Team*

Water Quality- There is a concern that herbicide use could pollute water in streams and waterways. *Source: ID Team*

Air Quality- There is public concern that the use of foliar applied herbicide may degrade air quality, potentially causing health problems to those living downwind of the project area. *Source: ID Team and scoping comments*

Recreation- There is a concern that herbicide use may degrade the recreational experience of forest visitors within the project area. *Source: ID Team*

Visual Resources- There is a concern herbicide use may compromise the scenic integrity and visual quality of the project area. *Source: ID Team*

Vegetation- There is a lack of early seral habitat within the watersheds. Populations of non-native invasive species (NNIS) have been documented within the project area. *Source: ID Team*

Wildlife and Fisheries- There is a concern that herbicide use could cause unacceptable impacts to wildlife and fisheries populations or habitats. *Source: ID Team and scoping comments*

Threatened, Endangered, and Sensitive (TES) Species and Habitats- There is a concern that herbicide use may impact populations of TES or their habitats. *Source: ID Team*

Climate Change- There is a concern that herbicide use could cause or contribute to greenhouse gas (GHG) emissions and contribute to increased climate change. *Source: ID Team*

Human Health Factors- There is a concern that the application of herbicides could cause hazards to human health and safety. *Source: ID Team and scoping comments*

Heritage Resources- There is a concern that herbicide use could impact both historic and prehistoric sites during project implementation by exposing workers or forest visitors to areas containing sensitive cultural sites. *Source: ID Team and scoping comments*

I. Decision to Be Made

The District Ranger will select one of the following and determine if the selection would or would not significantly affect the quality of the human environment.

1. Select management action described in the Proposed Action (PA).
2. Decide not to implement any action by selecting Alternative 1 (the No Action Alternative). This is the "No Herbicide Use" Alternative.
3. Select management actions described in the PA with some modifications or the alternative with some modifications.

Chapter II

Alternatives Including the Proposed Action

A. Process Used to Develop the Alternatives

The IDT represents the range of resources across the forest, such as recreation, timber, wildlife, soils, water and air. The IDT considered the following elements when they developed the alternatives for this analysis:

- The goals, objectives, and desired future conditions for the project area as outlined in the RLRMP for the Ozark–St. Francis National Forests.
- Comments received from the public, State and other agencies during the scoping process.
- The laws, regulations, and policies that govern land management on national forests.

B. Alternatives Considered

One alternative, the No Action Alternative, was developed in this environmental analysis.

The Proposed Action (PA)
Amend SWPA's existing Special Use Permit to allow use of specific herbicides for the control of vegetation within their two permit areas. One permit area is an overhead transmission line 100 feet wide ROW by 20.5 miles long (248.5 acres). If approved, the amendment would allow for the control of woody species and NNIS using specific herbicides within this area. The other permit area is a communication site approximately one acre in size which includes a tower, a small building and a chain-link fence around the permit area. The amendment, if approved, would allow for the use of specific herbicides to control woody, herbaceous, and NNIS plants at the communication site.

The application of the herbicide within the permit areas would be performed by individuals walking the permit areas using low-pressure backpack sprayers to target vegetation (no motorized application would be permitted). Foliar, basal spray, and/or stem injection are the types of applications which would be permitted (broadcast spraying is not a part of this proposal). The type and size of vegetation present in a particular area would determine which herbicide application method would be used. In some situations both foliar spray and cut surface treatments may need to be used in the same area. As need dictates, two herbicides may be mixed together in the same tank in order to make the chemical treatment more effective. The foliar spray (commercial herbicide formulations and water mixture) is designed for application to the foliage (leaves) of woody stem vegetation, including brush and trees. A foliar spray application could be used with the maximum height of vegetation being five feet.

The cut surface would be applied to larger woody stem vegetation unsuitable for the foliar spray treatment. Brush or trees greater than five feet or greater than three inches in diameter are typically more effectively managed by this method. Once such larger stems are identified, the

field crew would cut or hack a ring of cup-like pockets around the stem into the cambium layer. The herbicide would then be applied directly into the cut stem area at an approximate ratio of 1 cc per one-inch diameter of stem (i.e., a four-inch stem would be treated around the cut ring with an approximately 4 cc mixture). It is expected that his method would primarily be used within the transmission line portion of the permit area.

Table 1shows number of acres, herbicides used, and method of application for the treatments proposed in the PA.

Table 1: Herbicide Use Table

Treatment Area	Glyphosate	Metsulfuron methyl	Imazapyr	Triclopyr (ester)	Triclopyr (amine)	Triclopyr (amine) & Imazapyr	Acres
Overhead Transmission ROW treat for Herbaceous, woody, and NNIS control	Foliar* Stem injection	Foliar	Foliar, stem injection	Basal Spray	Foliar, stem injection, cut surface	Foliar, stem injection, cut surface	248.5
Communication Site treat for Herbaceous, woody and NNIS control	Foliar* Stem injection	Foliar	Foliar, stem injection	Basal Spray	Foliar, stem injection, cut surface	Foliar, stem injection, cut surface	1
Total							249.5

*Glyphosate is generally not considered suitable for ROW application because it kills the grasses and leaves soil vulnerable to erosion, but in this instance it could be allowed to be used within the ROW to control herbaceous NNIS.

Notes: Adjuvants (such as Cide-Kick) may be added to the herbicide to improve effectiveness and control of target species. All herbicides will be applied at rates and use only application methods specified on the label. Additional spot treatments would be needed to reach the desired future condition in some areas.

Table 2 illustrates the herbicide treatments for the identified Nonnative Invasive Species in the project area.

Table 2: NNIS/ Herbicide Treatment Table

Non-Native Invasive Species Treated	Herbicide Treatment
Privet -*ligustrum spp.*	Glyphosate or Metsulfuron methyl
Paulownia- *paulownia tomentosa*	Imazapyr (large stems) Triclopyr (sprouts)
Tree of Heaven- *Ailanthus altissima*	Imazapyr (large stems) Triclopyr (sprouts)
Exotic Lespedezas- *cuneata* and *bicolor*	Metsulfuron methyl or Triclopyr
Japanese Honeysuckle- *Lonicera japonica*	Triclopyr
Nonnative Rose- *Rosa multiflora*	Imazapyr or Metsulfuron methyl
Mimosa- *Albizia julibrissin*	Imazapyr (large stems) Triclopyr (sprouts)
Japanese stiltgrass- *Microstegium vimineum*	Glyphosate

Recommended controls are those provided by:

- ***Invasive Plant Responses to Silvicultural Practices in the South*** - Evans, Moorhead, Bargeron and Douce
- ***Nonnative Invasive Plants of Southern Forests*** – James H. Miller

As new NNIS are found, they would be treated using appropriate methods, following application rates on herbicide lables. Application rates will be in accordance with manufacture's label.

Alternatives to the Proposed Action

Alternative 1: No Amendment

The amendment to SWPA's existing Special Use would not be granted, herbicide application as a means of control of woody species and NNIS on up to 249.5 acres, would not occur. SWPA would continue to maintain their permit areas utilizing mechanical and heavy specialized equipment.

Past, Present and Reasonably Foreseeable Future Actions

Within the project area there are some past, present, and reasonably foreseeable treatments that are **NOT** part of the proposed action **or** any part of the alternatives to the Proposed Action, but have occurred or are expected to occur within the foreseeable future. Tables 3- 6 (pages II-3 through II-6) show the treatments considered in this EA as cumulative effects.

Table 3: Past, present and future management activities in area of proposal

Treatments (On USFS Land)	Acres/ Miles	Year Treated
Moccasin Gap Trail Maintenance	24mi	2011
Moccasin Gap Trail Relocation/New Construction	15mi	2012
Moccasin Gap Trail Obliteration	12mi	2012
Future Actions	**Approx. Acres or Miles**	**Approx. Year**
Moccasin Gap Day-use parking area construction (3) areas	5.0ac	2013/2014
Highway 7 Passing Lane Project Granny Gap-Moccasin Gap section	10 ac	2016

Table 4: Activities which will occur in the High Mtn. Project from present through 2018

High Mountain Project Treatments	Acres or Miles
Recreation	
Horse/ATV trail Construction/Relocation (mi.)	3.2
Horse/ATV trail Decommission/Obliteration	3.3
Multiuse Trail Construction for Buzzard Roost Access (mi.)	1.5
Construction of 2 Day Use Parking areas for Buzzard Roost access (Acres)	2.0
Construction of Hiking Trail South from Long Pool Rec. Area (mi.)	2.5
Emergency closure gate(s) and turnaround on Long Pool entrance road (Acres)	1.0
Wildlife	
Field Mgt. for Improved Forage	465*
Non-Native Invasive Species Control	500*yr
Wildlife Ponds (no.)	25
Native Cane Restoration	323
Placement of Large Woody Debris	Yes
Forestry	
Existing Woodland Management	224*
Woodland Management	407*
Pine Seed Tree Regeneration Harvest	871*
Pine Shelterwood Harvest	980*
Pine Seed Tree Removal	111*
Hardwood Shelterwood Harvest	822*
Hardwood Commercial Thinning	1,911
Pine Commercial Thinning	3,326
Hardwood Thinning for Firewood	99
Seedling Release and Pre-commercial Thinning	521*
Pre-commercial Thinning	684
Timber Stand Improvement Thinning	578*
One time Site Preparation Burning for Planting	1,657
Prescribed Burning as needed	751

Table 4(Cont'd): Activities which will occur in the High Mtn. Project from present through 2018

High Mountain Project Treatments	Acres or Miles
Road Management	
Temporary Roads (mi.)	20
Road Reconstruction (mi.)	18
Road Maintenance (mi.)	52
Maintenance and Road Closure (mi.)	24
Road Decommissioning of (mi.)	24
Road Closure of (mi.)	14

Note: * Herbicides would be used as part of these treatments

Table 5: Activities which will occur in the Bearcat Hollow Phase II Project present through 2018.

Bearcat Hollow Phase II Project Treatments	Acres or Miles
Recreation	
Horse trail Designation (mi.)	41
Multi-Use trail Designation	4
Parking Lot Expansion	Yes
Wildlife	
Field Mgt for High Quality Forage	1,233*
Non-Native Invasive Species Control	500*yr
Wildlife Ponds (no.)	20
Native Cane Restoration	270
Placement of Large Woody Debris	Yes
Forestry	
Existing Woodland Management	2,694*
Pine Seed Tree Regeneration Harvest	60*
Shelterwood Harvest	680*
Hardwood Commercial Thinning	7,342**
Pine Commercial Thinning	1,547
Cedar Thinning	80
Failed Pine Regeneration	49*
Seedling Release	911*
Prescribe Burning	13,792
Road Management	
Temporary Roads (mi.)	20
Road Decommissioning (mi.)	6
Road Construction (mi.)	1
Road Reconstruction (mi.)	8
Road Maintenance (mi.)	108
Road Closure (mi.)	20

Note: * Herbicides would be used as part of these treatmentsMaximum of 50% of area treated with herbicides.

Table 6: Activities which will occur in the Sugartree Project present through 2016.

Sugartree Project Treatments	Acres or Miles
High Quality Forage Openings	34*
Site Preparation for Regeneration w/ herbicide	444*
Site Preparation for Regeneration manual	857
Pine Seed Tree Regeneration Harvest	257
Shelterwood Harvest	1,044
Hardwood Salvage Harvest	588
Wildlife Stand Improvements w/herbicide	3,472*
Wildlife Stand Improvement -manual	391
Pre-Commercial Thin	1,339
Pine Commercial Thinning	2,749
Hardwood Commercial Thinning	5,141
Sugartree Project Treatments	**Acres or Miles**
Seedling Release	1,301*
Under/Midstory Reduction w/herbicide	2,086*
Under/Midstory Reduction -Manual	472
Non-Native Invasive Species Control	500*yr
Wildlife Ponds (no.)	2
Horse trail Designation (mi.)	7
Multi-Use trail Designation	11
Prescribe Burning	9,013
Temporary Roads (mi.)	22.2
Road Decommissioning (mi.)	3.7
Road Reconstruction (mi.)	43
Road Maintenance (mi.)	42.4
Road Closure (mi.)	25
Road Maintenance then Closure (mi.)	11.2
Native Cane Restoration	1,100
Lost Corner CCC Reclamation	5*

Note: * Herbicides would be used as a part of these treatments

C. Comparison of Alternatives

Table 7 provides a summary of the actions involved in implementing each alternative.

Table 7: Comparison of Alternatives

	Alternative I					Proposed Action			
Years	**1**	**3**	**6**	**9**	**Total**	**1**	**5**	**10**	**Total**
Soil Compaction	Low	Low	Low	Low	Low	Low	None	None	Low/None
Sediment	Low	Low	Low	Low	Low	Low	None	None	Low/None
Water Quality	Good	Good	Good	Good	Good	Good	Good	Good	Good
Human Health Risk (man-hours lost)	103.2	103.2	103.2	103.2	412.8	103.2	70.2	46.8	220.2
Economic Costs (Thousands of $)	$145	$149	$153	$158	$605	$116	$87	$58	$261
% Reduction of Woody Vegetation	0	0	0	0	0	0	25	50	50
Acres Treated	211.5	211.5	211.5	211.5	211.5	211.5	160	105	105

	Alternative I					Proposed Action			
Years	**1**	**3**	**6**	**9**	**Total**	**1**	**5**	**10**	**Total**
(% of total)	(85%)	(85%)	(85%)	(85%)	(85%)	(85%)	(64%)	(42%)	(42%)

Source: SWPA, 2012

Assumptions:

- *Alternative I requires mechanical vegetation management across the total permit area (approximately 249.5 acres) every three years.*
- *The Proposed Action would necessitate both mechanical and herbicide treatment across 85% of the permit areas during the first year only (repeat herbicide applications would diminish over time)*
- *Human Health Risk based on injury/illness exposure to hazards of utilizing heavy equipment and chainsaws vs. exposure to environmental hazards of working in outdoor environment expressed in man hours. Total man-hours per year = 2,400 (15 weeks work *40 hours per week * 4 workers). 2009 Incidence rates: Construction 4.3, Outdoor Labor Contractors 3.9 (OSHA, 2009).*
- *Economic cost is the total cost of implementation of each alternative.*
- *% reduction of woody vegetation based on reduction of stem count after treatment. No stem count reductions apply after mechanical clearing as woody vegetation would re-sprout.*

Estimated existing vegetation habitat/coverage within the Project Area consist of 85% woody species (approx. 211.5acres), 10% riparian habitat (approx. 25.5acres), and 5% grassy/grazing lands (approx. 12.5 acres). Limited or no treatment applied to riparian and grassy areas.

D. Effects Comparison of Treatments to Alternatives

Table 8 is designed to contrast the effects of the alternatives to the Proposed Action.

Table 8: Effects Table Comparing Treatments to Alternatives

Treatments	Proposed Action	Alternative 1
Soil Productivity Reduction	0*	0*
Sediment Created (tons)	0	0
Herbicide Use (acres)	249.5	0
Early Successional Habitat%	100	100

***** RLRMP states not more than 15% of an activity area can sustain a reduction in soil productivity.

E. Protective Measures

In order to protect the environment and lessen possible negative impacts, the applicable measures contained in the Forest-Wide (FW) Standards of the RLRMP and Management Area (MA) standards for the Ozark/St-Francis National Forests (OSFNFs) would be applied to the PA and are incorporated in this EA. *Best Management Practices; Guidelines for Silviculture Activities in Arkansas* (BMP) would apply as standard protective measures even though the proposal is for an overhead transmission line and a communication site.

Forest-Wide and Management Area Standards which most apply to this proposal:
FW20: Herbicides and application methods would be chosen to minimize risk to human and wildlife health and the environment. Diesel oil would not be used as a carrier for herbicides, except as a component of a formulated product when purchased from the manufacturer. Vegetable oils would be used as a carrier for herbicides when available and compatible with the application proposed.

FW21: Herbicides would be applied at the lowest rate effective in meeting project objectives and according to guidelines for protecting human and wildlife health. Application rate and work time would not exceed levels that pose an unacceptable level of risk to human or wildlife health. If the rate or exposure time being evaluated causes the Margin of Safety (MOS) or the Hazard Quotient (HQ) computed for a proposed treatment to fail to achieve the current Forest Service Region 8 standard for acceptability (acceptability requires a MOS > 100 or, using the Risk Assessments found on the Forest Service website, a HQ of < 1.0), an alternative method of treatment would be used.

FW23: Weather is monitored and the project is suspended if temperature, humidity, and/or wind exceed the criteria shown in Table 9.

Table 9: Criteria for Ceasing Herbicide Application (Copied directly from RLRMP)

Application Techniques	Temperatures Higher Than	Humidity Less Than	Wind (at Target) Greater Than
Ground			
Hand (cut surface)	NA	NA	NA
Hand (other)	98°	20%	15 mph

FW24: Each Contracting Officer's Representative (COR), who must ensure compliance on contracted herbicide projects, would be a certified pesticide applicator.

FW26: With the exception of treatment by permittees of ROW corridors that are continuous into or out of private lands and through Forest Service managed areas, no herbicide would be broadcast within 100 feet of private land or 300 feet of a private residence unless the landowner should agree to closer treatment. Buffers would be clearly marked before treatment so applicators could easily see and avoid them.

FW29: Application equipment, empty herbicide containers, clothes worn during treatment, and skin would not be cleaned in open water or wells. Mixing and cleaning water would come from a public water supply and transported in separate labeled containers.

FW30: Herbicide mixing, loading, or cleaning areas in the field would not be located within 300 feet of private lands, open water or wells, or other sensitive areas.

FW32: Herbicides would not be used within the appropriate Streamside Management Zone (SMZ) or within 300 feet of any public or domestic water intake. Selective treatments may occur within SMZs only when a site-specific analysis of actions to prevent significant environmental damage such as noxious weed infestations supports a "Finding of No Significant

Impact" (FONSI), and then using only herbicides labeled for both terrestrial and aquatic use within these areas.

Management Area 1.C Designated (including recommended) Wild and Scenic Rivers
MA1.C-18 The scenic integrity objective is high for all inventoried scenic classes.

MA1.C-22 Permits will not be issued for activities on National Forest lands that are inconsistent with the management goals for the river corridor.

Management Area 1.H Scenic Byway Corridors
MA1.H-1 Management activities are designed to meet or exceed the assigned Scenic Integrity Objectives.

MA1.H-3 Vegetation management will be accomplished with management-ignited prescribed fire, wild-land fire use, **chemical**, and mechanical treatments as an appropriate method of reducing costs associated with these activities.

MA1.H-7 These areas are unsuitable for designation of new utility corridors, utility rights of way or communication sites. Continue existing uses. Require necessary mitigation techniques including screening, feathering, and other vegetation management techniques to mitigate the visual and other impacts of upgraded utility corridors or communication sites.

MA1.H-9 Allow vegetation management activities to control non-native invasive vegetation

Forest Service Manuel Reference 2109:

42 - TRANSPORTATION. Follow the recommended procedures for transporting pesticides in 49 CFR Part 171.

42.1 - GENERAL REQUIREMENTS. Accidental spills can occur during the transport of pesticides because damage to pesticide containers most often occurs during loading and transport. Observe the following general safety precautions to minimize such incidents and mitigate their effects when they do occur:

1. Transport from the storage area only the quantity needed for the day's operations. Return leftover pesticides to an approved pesticide storage facility at the end of each day.

F. Project Designs
A project design is a direction that is applied to similar areas on all projects and is not site specific to one project area, stand, road, or area. A list of applicable project designs is incorporated into this document as Appendix E and is taken directly from the Ozark-St Francis Revised Land Resource Management Plan.

G. Monitoring

1. Monitoring would be accomplished through contract inspections conducted by a certified applicator/inspector. Appropriate standards and guidelines would be implemented and maintained through active treatment to protect soil productivity, water quality and all other resources.

2. In order to determine how well treatments are achieving the desired future conditions, baseline monitoring would be established prior to or concurrent with treatments to evaluate selected habitat. It may also include invasive species in order to evaluate their response to treatments.

3. For those actions prescribing the use of herbicides, monitoring to ensure that herbicide label instructions are being followed would be conducted as part of the "on the ground" contract administration. To monitor any off-site movement of herbicides, water sampling would be conducted on 10% of sites where herbicides are used.

4. A review of all known occurrences of proposed, endangered, threatened or sensitive species (PETS) has been conducted. In addition, field surveys have been conducted within the current permit areas. If any new proposed, threatened or endangered species are discovered, the activity will be halted and the District Biologist will be contacted to determine what, if any, consultation with the US Fish and Wildlife service is needed, and what specific measures to implement to avoid any adverse effects.

H. Site Specific Design Criteria

The following are site specific design criteria to minimize impacts created from the proposed action's vegetative treatments. The project designs below are specific for the permit areas:

- Forest-Wide Standard # 26 (see above)
- Application of herbicides would only occur on days the weather forecast predicts no rain for a 24-hour period after treatment.
- Use in the SMZ of streams and near pond banks must carry an aquatic label.
- No application of Imazapyr (Arsenal) or Metsulfuron methyl (Escort) would be applied on predominately clay soils.
- Herbicide application would not be applied within 15 feet of any flowing surface water.
- If any proposed, endangered, or threatened species are discovered prior to or during implementation, the projects would be halted until the potential effects are determined and new mitigations are in place if required.
- No herbicide would be applied within 60 feet of the Ozark Chinquapin or Southern yellow lady slipper.

Chapter III
Environmental Effects

A. SOILS

Existing Condition

The analysis area for soils will be the 100-foot wide area beneath the powerline on National Forest land. The project area is located in a heavily dissected section called the Boston Mountains. Project area elevation varies from about 640 feet in the southwestern corner of the project area south of Rough Hollow to 2,040 feet on Raspberry Mountain and down to 1,800 feet above mean sea level in Searcy County in the northeastern part of the project area. Several types of topography exist in this Boston Mountain section. The project area extends from foot slopes over common Stair-stepped landforms, called "Bluff-Bench" topography, that developed from the long term weathering/erosion of sedimentary layers of different hardness, mainly shales and sandstones, across floodplains and broad ridgetops. Project area topography varies from 0-3% slope on mountain tops, benches, and creek bottoms, to fairly steep 40-60% on the 200 to 300 foot slopes between the benches and just above the stream bottoms.

The soils in the project area are mostly stable, except for those in sections of the project area where illegal off road vehicle trails exist. Soils range from shallow to deep and are mostly well drained. There are small inclusions of hydric soils in the Spadra loam occassionally flooded soil map units which are potential wetland areas. A wetland consists of hydric soils, water loving vegetation, and water or wet conditions. One area in the Spadra loam soil map unit near the intersection of the powerline ROW and the North Fork of the Illinois Bayou that was identified during the biological evaluation has wetland vegetation. There are some short sections of eroding illegal trails along the powerline ROW in section 2 T10N R20W, section 25 T12N R19W, and section 33 T13N R18W.

Soils hazard of erosion is based on the rating for off-road or off-trail erosion that was developed using slope and on soil erodibility Factor K. The soil loss is caused by sheet or rill erosion in off-road or off-trail areas where 50 to 75 percent of the surface has been exposed by logging, grazing, mining, or other kinds of disturbance. The hazard is described as slight, moderate, severe, or very severe. A rating of slight indicates that erosion is unlikely under ordinary climatic conditions; moderate indicates that some erosion is likely and that erosion-control measures may be needed; severe indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and very severe indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical. Table 10 explains the ratings in the project area.

Table 10: Soil Map Unit Hazard of Erosion

Rating	Acres	Percent of Project Area
Slight	127	51
Moderate	112	45
Severe	10	4

The soil rutting hazard is based on depth to a water table, rock fragments on or below the surface, the Unified classification, depth to a restrictive layer, and slope. Ruts form as a result of the operation of forest equipment. The hazard is described as slight, moderate, or severe. A rating of slight indicates that the soil is subject to little or no rutting, moderate indicates that rutting is likely, and severe indicates that ruts form readily. See Table 11 for the soil rutting hazard in the project area.

Table 11: Soil Rutting Hazard

Rating	Acres	Percent of the Project Area
Slight	113	45
Moderate	134	54
Severe	2	1

The Proposed Action

Direct/Indirect Effects

Forty-five percent (45%) of the project area has a moderate risk of erosion and four percent (4%) has a severe risk. Erosion occurs when 50 to 75% of the surface is exposed by disturbance (USDA NRCS 2005). Little to no exposed soil is expected due the mechanical treatments that would be done in the first year because cut vegetation would be left on site and the roots would remain in the soil. Grasses and herbaceous plants would become established after the woody vegetation is cut and would provide protection for the soil. Herbicide treatments would not result in any exposed soil because the treated plant would remain in place and grasses and herbaceous plants would become established in and around the dead woody plants.

Fifty-four percent (54%) of the project area has a moderate risk for rutting and one percent (1%) has a severe risk. Little to no rutting is expected as a result of mechanical treatment of vegetation during the first year if treatments are done when the water table is greater than 12 inches below the surface and soils are below the plastic limit. No rutting is expected from herbicide treatments because treatments would be performed by people on foot.

The herbicides that are to be used are not expected to have any negative impacts on the soils. A brief summary of each of the herbicides' characteristics relating to soils is given below.

Glyphosate is readily absorbed by foliage. It had practically no leaching characteristics because it binds tightly to the soil. In soil, it is highly susceptible to degradation by microorganisms, being converted to natural products such as carbon dioxide and water. Persistence in soils is about two months or less.

Triclopyr is absorbed by plant roots, but it is not considered effective as a soil-applied herbicide. Triclopyr is adsorbed primarily to organic matter particles in soil. The organic matter content is the primary factor in the degree of soil adsorption. Long-term forest and pasture field studies found very little indication that triclopyr will leach substantially either horizontally or vertically in loamy soils (Syracuse Enviornmental Research Associates [SERA], Inc. 1996c cited in USFS PNW Region 1996). Microorganisms degrade triclopyr readily. It degrades more rapidly under warm, moist conditions which favor microbial activity. The average half life for triclopyr in soil is 30 days (Tu et. al. 2001). Triclopyr did not affect the growth of soil microorganisms up to 500

parts per million (Forest Service 1984). Triclopyr can be slightly toxic to bacteria, actinomycetes and fungi (Sapundzhieva, 1987 cited in Brown et. al. 1990). The warm temperatures at the time of application and the high density of plant roots are expected to rapidly degrade triclopyr.

Imazapyr is relatively non-toxic to soil microorganisms, aquatic invertebrates, and fish. Effects on bacteria appear to be highly species specific with variations in sensitivity of up to a factor of 100. Imazapyr appears to have the potential to shift bacterial soil populations that contain sensitive species of bacteria. A computer program, Gleams-Driver is a program that the Forest Service developed to estimate expected peak and longer-term pesticide concentrations in surface water. Gleams-Driver serves as a preprocessor and post processor for GLEAMS, a field scale model developed by the United States Department of Agriculture Agricultural Research Service. GLEAMS is a computer program used to simulate water quality events on agricultural fields. GLEAMS has been used to evalutate the hydrologic and water quality response of different scenarios considering the application of pesticides and other compounds. Gleams-Driver was used to simulate pesticide losses to surface water from 100 modeled applications at a unit application rate of 1 pound of imazapyr active ingredient per acre. Simulations were run for clayey, loamy, and sandy soils on a variety of locations and different climatic conditions. The simulations resulted in peak concentrations of imazapyr expected in the top 12 inches of soil of 0.32 (0.218 to 0.46) mg active ingredient per kilogram of soil. These concentrations are far below the range of reported Lethal Concentrations for 50% of microorganisms in liquid culture- i.e., 2.61to 261 mg/L (Forlani et al. 1995 cited in Durking and Follansbee 2004). There does not appear to be any basis for asserting that imazapyr is likely to adversely effect microorganisms in soil. If imazapyr were extremely toxic to terrestrial microorganisms that are important for the maintenance of soil suitable for plant growth, it seems reasonable to assume that secondary signs of injury to microbial populations would have been reported (Durkin and Follansbee 2004). Degradation halftime in soils ranges from 25 to 180 days.

Metsulfuron methyl effects on soil organisms appears to be transient and recovery occurs within 9 to 14 days (Ismail et. al. 1996, 1998 cited in Klotzbach and Durkin 2005). Metsulfuron methyl breaks down faster under acidic conditions and in soils with higher moisture contents and higher temperatures (Cornell Extension Toxicology Network 1993). It has a higher mobility potential in alkaline soils than acidic soils. Soils in the project area are acidic, so mobility potential in soils is lower. The half-life in soils ranges from 14 to 180 days with an overall average of 30 days.

Cumulative Effects

Little to no cumulative effects to soils are expected because vegetation will be left on site to protect the soils, and vegetation treated with herbicides will remain and grasses and herbaceous plants will develop around them to protect the soils. In addition, soil disturbing activities in the project area will not overlap in time and space so no cumulative effects are expected.

Alternative 1: No Action

Direct/Indirect/Cumulative Effects

Effects to the soil as a result of mechanical treatments are the same as those in the proposed action, except no herbicides would be used. Cumulative effects could occur because repeated more frequent mechanical treatments would be needed. Compaction and rutting could occur due to the wearing away of the vegetation due to re-occurring mechanical treatment using heavy equipment.

B. HYDROLOGY and WATER

Existing Condition

The Arkansas Department of Environmental Quality (ADEQ) has divided the state into ecoregions for use in assessing water quality in accordance with Section 305(b) of the Clean Water Act (CWA) (Figure 1). Lands within the project area are located within two major hydrologic sub-basins and subdivided into four watersheds (5th level Hydrologic Units) located in the Boston Mountains and Arkansas River Valley ecoregions. The boundaries of these ecoregions are displayed in Figure 1.

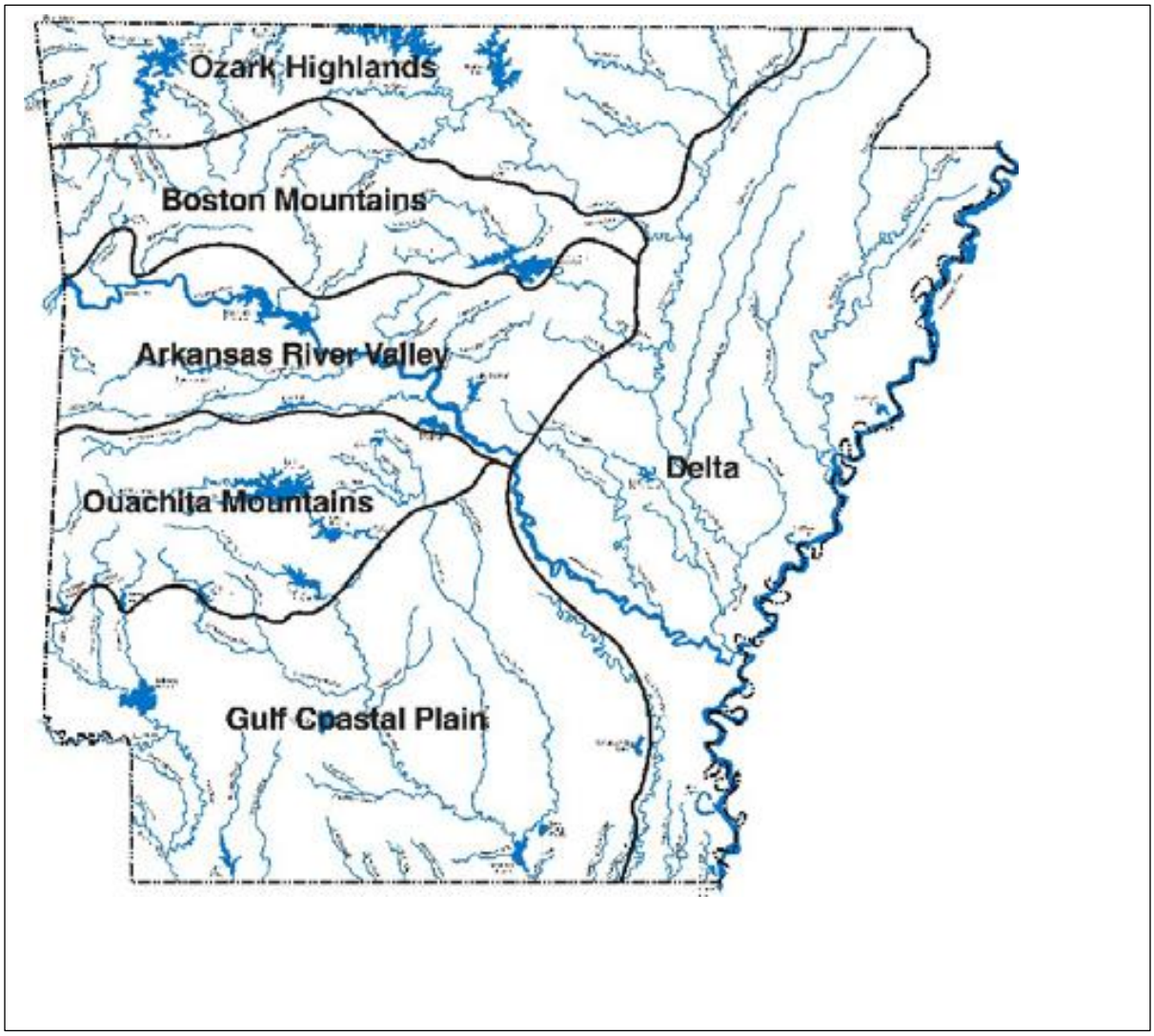

Figure 1: ADEQ State Ecoregions for Water Quality Purposes

The Boston Mountains Ecoregion lies north of the Arkansas River in northwest Arkansas and is characterized by mountainous terrain with a sparse population. Here, runoff is rapid and flash floods common, providing seasonal scour. Streams are generally pool-and-riffle type, with a bottom of sand, gravel, rubble, boulders, or bedrock. Although the power line runs mostly along ridges, it does cross stream channels of different sizes along its route. Named streams that are crossed by the power line include Dry Creek and North Fork Illinois Bayou. The primary land use is silviculture, typical of the project area, and much of the region is located within the Ozark – St. Francis National Forests.

The surface waters of the Arkansas River Valley ecoregion exhibit distinct seasonal characteristics, with zero flows common during the summer. Primary land uses in the Arkansas River Valley include silviculture, pasture, and urban settings. Table 12 identifies project area watersheds.

Table 12: Project Area Watersheds

Sub-Basin	Watershed	Ecoregion
11010005 Buffalo		
	1101000503 Richland Creek-Buffalo River	Boston Mountains
11110202 Dardanelle Reservoir		
	111020207 Little Piney Creek	Boston Mountains
	1111020208 Lower Big Piney Creek	Boston Mountains, Arkansas River Valley
	1111020209 Upper Illinois Bayou	Boston Mountains

Source: SWPA, 2011

Section 303(d) of the CWA requires states to identify waters that do not meet, or are not expected to meet, applicable water quality standards. These water bodies are compiled into a list known as the 303(d) list. The regulation (40 CFR 130.7) requires that each 303(d) list be prioritized and identify waters targeted for Total Maximum Daily Load (TMDL) development. The ADEQ's 2012 Water Quality Inventory Report (ADEQ, 2012) divided the impaired water body segments into categories. The waters listed in Category 5a are those waters that are considered impaired and would require the development of a TMDL, unless some other pollution control mechanism is implemented and future assessments indicate full attainment of water quality standards. None of the watersheds considered for this planning effort were found to have surface waters on the 2012 State 303(d) list as non-supportive of designated uses nor did they have established TMDLs.

The Arkansas Pollution Control and Ecology (PC&E) Commission (APCEC) designated certain water bodies as Extraordinary Resource Waters (PC&E Regulation 2) to be protected from degradation through water quality controls, maintenance of natural flow regime, protection of in stream habitat, and encouragement of land management practices protective of the watershed. These water bodies are the most pristine in Arkansas and are important waters for fishing and recreation as well as for rare and endangered wildlife. Of the 20,000 stream miles in Arkansas, only 16% are designated extraordinary. The North Fork of the Illinois Bayou is the only Extraordinary Resource Water crossed by the project area corridor.

Protecting water quality is a priority of the public as well as state and federal agencies. Certain geologic features such as carbonate geology with karst characteristics are vulnerable to potential contamination by rapid infiltration of precipitation through sinkholes, fractures and solution cavities into the uppermost aquifer. However, no carbonate geology or karst features were identified during field investigations within the proposed project area. If karst features are discovered, they will be protected and managed as outlined in the 2005 Land and Resource Management Plan (LRMP) for the Ozark - St. Francis National Forests as listed below:

FW43: Karst management zones (KMZs) will be applied in a manner similar to that of streamside management zones (SMZs). Where karst features are identified, the boundaries of the KMZs will be delineated according to significance of karst features or potential risks. For karst

features that are of significance or where the potential risks to water resources are great, a KMZ of 100 feet will be applied. For karst features that are less significant or where minimal potential risks to water resources exist, a KMZ of 50 feet will be applied. Karst management zones are mitigation measures primarily for the protection and conservation of groundwater resources and cave dependent species. These buffer designations are minimums and can be increased as necessary to provide appropriate mitigation measures as deemed necessary. Activities prohibited within these areas include:

- Use of motorized wheeled or tracked equipment (except on existing roads and trails).
- Mechanical site preparation.
- Recreational site construction.
- Tractor constructed fire lines for prescribed fire.
- Herbicide application.
- Construction of new roads, skid trails, and log landings.
- Slash disposal.

Stormwater is water that drains from the land into streams or river channels after precipitation. Runoff volume is a function of precipitation, topography, geology, soil moisture, land use, and other factors. Mean annual runoff from areas encompassing the Ozark – St. Francis National Forests varies from 18 to 20 inches per year. Due to area geology and surface soils, stormwater runoff accumulates rapidly in streams, resulting in flash floods during heavy precipitation events. Conversely, the subsurface geology has low porosity, minimizing the storage necessary for sustained base flows, and many streams are dry during summer months (Forest Service 2005a). Shallow fresh-water aquifer systems are found throughout Arkansas and supply an abundance of high-quality groundwater for a wide range of uses including industrial, municipal, agricultural and domestic use. Groundwater is an important source of water supply in Arkansas. Most all of the surficial aquifers in Arkansas supply water of good to very good quality.

Water quality concerns resulting from natural water-rock interaction range from simple hardness issues related to high concentrations of dissolved calcium and magnesium to high concentrations of iron related to the dissolution of iron-oxide coatings from the aquifer sediments. Non-point sources of contamination range from elevated nutrients and bacteria in shallow aquifers in northern Arkansas associated with increased animal production and septic systems, to low-level pesticide detections in eastern Arkansas associated with row-crop agricultural practices.

Groundwater in Arkansas occurs in two general geologic settings, which are represented by seven major physiographic regions of the state: Ozark Highlands, Arkansas Valley, Boston Mountains, Ouachita Mountains, South Central Plains, Mississippi Alluvial Plain and Mississippi Valley Loess Plains. The project area is entirely within the Interior Highlands, which are comprised of the Ozark Highlands, Arkansas Valley, and Boston Mountains and Ouachita Mountains.

The Interior Highlands are underlain by thick sequences of consolidated rock of predominantly Paleozoic age. Groundwater in these consolidated rocks occurs primarily in fractures and joints in the sandstones and shales, in addition to fractures and solution openings (karst) in the

limestone and dolomites. This consolidated rock is important for both domestic and municipal water supplies.

The August 1996 amendments to the Safe Drinking Water Act directed the EPA to support the protection of all public drinking water sources. EPA is now working with the states, tribes and communities to develop the Source Water Assessment and Protection (SWAP) program, which addresses potential contamination of both surface and subsurface water sources. The Arkansas Department of Health (ADH) is developing and implementing the SWAP program for the state. Source water is defined as untreated water from streams, rivers, lakes, springs and aquifers that is used as a supply of drinking water. Source water areas are the sources of drinking water delineated and mapped by the ADH for each federally regulated public water system. The protection of source areas in lands managed by the Forest Service is included in the planning process for National Forest management.

One of the main efforts to protect the groundwater resources in Arkansas is the Wellhead Protection program, which is managed by the ADH. The overall purpose of the program is to reduce the chance of contamination to public water supply wells. At present, more than 39 public water supply groundwater wells (7 wells are surface water influenced) are in the Ozark - St. Francis National Forests (USFS 2005a, USGS 2008). The State of Arkansas also has a separate program which regulates and assesses groundwater impacts from pesticide and herbicide usage; however, this monitoring program is limited to the eastern portions of the state and no data from the Ozark – St. Francis National Forests is available.

Groundwater availability within the project area is limited as a function of the low primary porosity of the area bedrock, resulting in little primary storage. As a result, groundwater occurs primarily in fractures and joints of the sandstones and shales. These sources provide local water supply for thousands of rural homes across the region. Within Pope County and within the Dardanelle Reservoir hydrologic unit, wells have been completed primarily within the Atoka Sandstone Formation with groundwater depths ranging from 20 - 120 feet below ground surface (bgs). Within Searcy County and within the Buffalo hydrologic unit, wells have been completed in a variety of formations, ranging from sandstones to shale to limestone with groundwater production at depths generally from 50-300 feet bgs (USGS, 2008). Yield is typically less than 10 gallons per minute (gpm) with yields greater than 25 gpm rare.

According to the National Wetland Inventory Database, there are no registered wetlands along the utility corridor within the National Forest. Small wetlands may exist near the edges of streams, especially at lower elevations where narrow floodplains have developed such as along the North Fork of the Illinois Bayou. If any wetlands are located, herbicide application would not occur or would be limited to herbicides labeled for aquatic use in these areas.

The Proposed Action

Direct/Indirect Effects

The Proposed Action would use hand-applied herbicide mixtures to control target vegetation within the project area. Only woody stem vegetation would be treated, and no broadcast, aerial or ground spraying would be conducted. Herbicides would be applied only according to

manufacturers' directions and mitigation measures outlined in the 2005 LRMP for the Ozark - St. Francis National Forests as listed below:

FW21: Herbicides are applied at the lowest rate effective in meeting project objectives and according to guidelines for protecting human and wildlife health.

FW30: Herbicide mixing, loading, or cleaning areas in the field are not located within 300 feet of private lands, open water or wells, or other sensitive areas.

FW32: Herbicide will not be used within the appropriate SMZs or within 300 feet of any public or domestic water intake. Selective treatments may occur within SMZs only when a site-specific analysis of actions to prevent significant environmental damage such as noxious weed infestations supports a FONSI, and then using only herbicides labeled for both terrestrial and aquatic use within these areas.

In addition, Southwest Power Associates (SWPA) restricts its herbicide application around water surfaces. Herbicides are not applied within 15 feet of any flowing surface water (MM5).

Because the proposed use of herbicides would not disturb the soils, herbicide usage would protect water quality and maintain site productivity by retaining nutrient-rich organic matter onsite within the analysis area. Sediments retained onsite do not contribute to additional nutrient loadings or physical deterioration of aquatic ecosystems and water resources through increased turbidity (Neary and Michael, 1996). Also, Maxwell and Neary (1991) concluded in a review that the impact of vegetation management techniques on erosion and sedimentation of water resources occurs in this order – (from least to greatest) herbicides, fire, then mechanical.

The proposed action of hand-applying herbicides to target woody stem vegetation would be conducted in the first year, followed by reapplication as needed with further increases in time required between applications. The continued use of heavy equipment would thus be dramatically reduced or eliminated. As grasses and low growing vegetation become densely established and heavy equipment is no longer routinely accessing the area, the soils would become more stable, decreasing erosion and the resulting water quality impacts from runoff. Furthermore, because herbicides would not be used within 15 feet of the water's edge, source water would have further protection from the potential contact of herbicides (Forest Service Manual 2526.03). These factors would ensure adherence to the Source Water Assessment and Protection Program developed by the Arkansas Department of Health (ADH).

Herbicides initially applied on foliage or directly onto the soil disappear in the soil through degradation, transport or a combination of both, and could potentially move into water bodies (environmental fate). Degradation over time reduces the amount of herbicide available for transport to off-site locations. Herbicide transport processes may include atmospheric drift, leaf and stem wash-off, plant uptake, soil leaching, volatilization, surface runoff and subsurface flow (Neary et al. 1993).

Although short term, low-level stream contamination has been observed for ephemeral to first order streams draining studied sites, levels of herbicides in these streams have been neither of

sufficient concentration nor of sufficient residence time to cause observable impacts on aquatic ecosystems (Michael et al., 2000).

Herbicides that reach surface and sub-surface waters do so primarily through runoff and leaching. Runoff is the waterborne transport of compounds over the earth's surface, while leaching is the process by which compounds are carried downward through the soil by percolation of rainwater, snow melt or irrigation water.

Most research on the effects of herbicides on the water quality of forest streams has been conducted in the southern U.S., and is therefore applicable to this EA. Precipitation in the southern U.S. is relatively consistent throughout the year, with the lowest levels occurring during the summer when sporadic thunderstorms constitute the majority of precipitation. Herbicide applications are proposed to occur in late spring through early fall, with most taking place during the driest portion of the year. Hand application by a backpack sprayer to only target vegetation poses little likelihood of contaminating surface waters. No ground or aerial broadcast activities would occur under the Proposed Action.

The proposed chemical herbicides for this alternative include formulations of glyphosate, imazapyr, metsulfuron methyl, and triclopyr. The Forest Service has prepared risk assessments (USDA, 2004) for the active ingredients in the proposed products and all are registered for use by the Forest Service under the 2005 LRMP. All proposed products are registered by the EPA for silvicultural and ROW use.

One of the four proposed herbicides, glyphosate, has an established EPA drinking water standard, a Maximum Contaminant Level (MCL) of 700 parts per billion (ppb). The other three herbicides do not have enforceable Utility Corridor MCLs, however, EPA has established Drinking Water Levels of Concern (DWLOCs) for all four proposed herbicides, which are theoretical upper limits on a pesticide's concentration in drinking water in light of total aggregate exposure to a pesticide in food and from residential uses. The DWLOC and MCL numbers are the same for glyphosate. The DWLOC for Imazapyr is 87,000 ppb and for metsulfuron methyl is 8,700 ppb. Triclopyr has no DWLOC but has a reference dose of 0.025 milligrams per kilogram per day. This translates to a 100 pound person drinking a liter of water per day containing 2,270 ppb Triclopyr (USDA, 2003-2004).

The greatest potential hazard to groundwater comes from stored concentrates, not operational application of diluted mixtures (Neary and Michael, 1996). Regional, confined, groundwater aquifers are not likely to be affected by silviculture herbicides (Neary, 1985). Surface unconfined aquifers in the immediate vicinity of herbicide application zones have the most potential for contamination. It is these aquifers that may be directly exposed to leaching of residues from the root zone.

Under the Proposed Action, herbicides would be applied specifically where vegetation is a concern. The specificity of application would reduce the amount of herbicide used, which would dramatically reduce the potential for groundwater impact. The herbicides have been evaluated to determine their ability to adsorb to soil particles. Herbicides that are strongly adsorbed to soil particles are less likely to leach into groundwater. To further reduce any potential impacts to

groundwater, herbicides are restricted from use within or near sinkholes, visible fractures in rock outcrops, sinking creeks, caverns, and glades, in accordance with LRMP FW43. No known karst features exist within the right of way. If discovered, these areas would be identified and delineated prior to herbicide application activities in accordance with LRMP Standards. Therefore, no direct or indirect impacts to groundwater are expected from implementation of the Proposed Action.

Cumulative Effects

Cumulative adverse water quality impacts from herbicide applications could result if multiple applications (either spatially or temporally) were to produce elevated herbicide concentrations. Cumulative effects could occur spatially when multiple treatments producing detectable chemical concentrations occur close enough together geographically, so that the effects of one treatment combine with the effects of others before dilution and degradation processes substantially reduce the concentrations. Cumulative effects could also occur temporally if degradation processes from a single treatment have not reduced concentrations before another treatment at the same location introduces new amounts of the chemical.

The potential for cumulative water quality effects from herbicide treatments depends on a variety of factors, including initial concentration of the herbicide in surface water, the frequency of treatment at each site, proximity of all treatment sites, frequency of treatments at others sites, rates of dilution and degradation processes that reduce chemical concentrations and treatment rates.

As directed by the 2005 LRMP, excessive loading of products in any particular area or too close together in time is not permitted; therefore, no cumulative impacts are expected as a result of implementation of the Proposed Action.

Cumulative adverse groundwater quality impacts from herbicide applications could result if activities from the proposed action are combined with other activities not otherwise associated with this project. However, because of the specificity of application and the absence of known karst features along the ROW, no impacts to groundwater are expected. Changes in groundwater quantity can exhibit seasonal and annual variability and any changes to water quantity would be due to these effects.

Alternative 1 (No Amendment)

Direct/Indirect Effects

The No Amendment Alternative would continue project area vegetation management by the use of heavy mechanized equipment, which has the potential to contribute to soil erosion. Sediment losses from sites where competing vegetation is controlled by mechanical methods can be one to two orders of magnitude greater than natural losses from undisturbed watersheds (USDA, 2009). The sediment from the erosion of soils becomes part of the normal fluvial sediment transport and storage process and results in an increase in turbidity of water resources. Mechanized vegetation control has the inherent possibility of localized contamination from oil, grease and fuels. Normal leakages as well as repairs and maintenance in the field could result in site contamination if BMPs are not strictly enforced.

Increased sediment migration could potentially reach adjacent streams and other water bodies. The sediment increases turbidity in water bodies, potentially resulting in minor, immediate adverse effects following heavy equipment use. Therefore, the continued use of heavy equipment in the project area has the potential to provide localized minor, direct and indirect adverse effects on water quality.

Mechanized entry is a soil disturbing activity that may compact soils in some areas and remove soil-holding vegetation in others. Under the No Amendment Alternative, any direct and indirect impacts to groundwater would be similar to those currently observed.

Cumulative Effects

Cumulative effects can be assessed based upon the types of activities that commonly affect water quality in the area, specifically road construction, land use conversion, and agriculture. Roadways into the forest, including those for maintenance of the power line, are already present and no construction of new roadways is planned by the Forest Service. Similarly, there are no areas planned for conversion of forest lands to urban use or agriculture which could introduce pesticides, pathogens, nutrient loading and higher sedimentation rates.

There are no known current or planned projects located adjacent to the project area that would impact surface water quality within or adjacent to the ROW. Therefore, other than localized, minor adverse effects on water quality resulting from continued heavy equipment use within the ROW, no additional cumulative impacts would occur as a result of continued implementation of the No Amendment Alternative.

Cumulative impacts to groundwater quality and quantity may occur as a result of activities outside the scope of this EA, including, but not limited to, forest management actions, wildfires, road construction, land use conversion and agriculture especially in any nearby areas with karst geologic features. These areas are more vulnerable to potential contamination due to rapid infiltration of precipitation through these features. Mechanized vegetation control increases the potential for erosion and reduces the soils that filter precipitation. However, the Forest Service closely regulates activities for all projects to reduce contamination of groundwater. Therefore, no measurable cumulative effects are expected as a result of the No Amendment Alternative.

C. AIR QUALITY

Existing Condition

Existing air emission sources of contaminants occurring within the analysis area (for the purpose of this document the analysis area is within the Big Piney Ranger District) consists mainly of mobile sources. These include, but are not limited to, combustion engines such as those found on vehicles and farm equipment, dust from unpaved surfaces and smoke from prescribed (federal, state, private, and non-governmental organizations) burning. Local homes also use wood burning fireplaces and heaters for winter heating. Some light industry, largely consisting of timber or poultry related activities, also occurs on private property near National Forest property.

The Clean Air Act requires the EPA to establish National Ambient Air Quality Standards (NAAQS) for six pollutants considered harmful to public health and the environment: carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter and sulfur dioxide. The standards were set at the level required to provide an ample margin of safety to protect the public health. An attainment area is a geographic area in which levels of a criteria air pollutant meet NAAQS for the pollutant. Under the Clean Air Act, any area that violates national ambient air quality standards for any of the six criteria pollutants as few as once per year and as often as four times over a three-year period is classified as a "non-attainment" area. There are no non-attainment areas for any of these six criteria pollutants for the analysis area. All of the analysis areas lie within attainment areas (EPA AIRS web site at www.epa.gov.data/index.html) and all alternatives are in general conformity with State and/or Tribal Implementation Plans (SIPS and/or TIPS).

The analysis area is within the Big Piney Ranger District of the Ozark National Forests in northwest Arkansas. These areas are not adjacent to, nor do they contain, any activity that would be a major continuous emitter of noise pollution. The Forest Service does conduct timber management practices that result in the periodic and localized harvesting of timber resources. Timbered properties adjacent to the National Forest may also harvest timber on a periodic basis. These practices do create noise on a localized and short-term basis from equipment and vehicles.

Alternative 1 (No Action)

Direct/Indirect Effects
The No Action Alternative would see a continuation of the existing air quality and the amount of noise pollution currently experienced within the analysis area. Mechanized vegetation control does create dust, equipment emissions and noise in a localized area during the periods of time when SWPA performs their ROW maintenance. Noise can have a short-term negative effect on some wildlife species such as nesting birds. The continued use of mechanical methods of ROW maintenance would result in the ongoing negative effects during the maintenance activities.

Cumulative Effects
The No Action Alternative would see SWPA continue periodic effects to air and noise quality. This would in no way push the air quality within the project area into non-attainment, but the project area would see short term minor air quality and noise quality decrease every 3-5 years as SWPA implemented their current maintenance plan under a Special Use permit.

Proposed Action

Direct/Indirect Effects
All herbicide application would be with hand-held backpack sprayers, with no aerial or broadcast spraying being conducted. Only target vegetation would be affected by using this method. The hack and squirt application method creates no potential for airborne mist as liquids are applied directly to the cut in the woody stem. The foliar application method directs the herbicide mixture from hand-held sprayers to the leaves of target woody stem plants. Best Management Practices ensure that herbicides are only applied during appropriate weather conditions, which reduces the air contact with the compounds. Unlike dry dusts generated from mechanical methods,

herbicides are applied in water mixtures and settle quickly on the target foliage. As noted in numerous studies, air pollution from the volatilization of the proposed herbicides is unlikely (Ganapathy 1997, DowAgroSciences 2002, USDA Forest Service 1995, Schuette 1998).

If the Proposed Action is chosen the need to utilize heavy equipment to cut the woody vegetation within the ROW would be dramatically decreased. Only on portions of the ROW where herbicide application could not be utilized (ex. within SMZs) would it be necessary to perform ROW maintenance with heavy equipment. The Proposed Action would provide a small direct positive effect to the air and noise quality by eliminating a majority of the dust, noise and emissions from performing the maintenance of the ROW exclusively by mechanical means.

Cumulative Effects

SWPA would measurably decrease the need to utilize heavy mechanical equipment to maintain their ROW. This would result in less air and noise pollution being produced. The Proposed Action would have a small positive cumulative effect to both noise and air pollution.

D. RECREATION/VISUAL QUALITY

Existing Conditions

The SWPA manages a 100-foot wide ROW for an overhead high power transmission line which enters the National Forest approximately two miles south of the Long Pool Recreation Area and runs generally to the northeast for a length of 20.5 miles exiting the National Forest approximately two miles southwest of the community of Witts Springs. In addition, SWPA has a communication tower located at the White Oak Mountain Communication Site approximately seven miles northeast of the town of Hector. The project area is located in Pope and Searcy counties.

The proposed actions lie within the following Management Areas as defined in the Forest Plan, which guides its management direction toward multiple uses, among which are wildlife, range, timber, aesthetics and recreation. Pages; 2-35 to 2-71

- 1. D Recommended Wild and Scenic Rivers 0.6 miles- 7.5 acres – 2.6% of the project
- 1. H Scenic Byway Corridors – 1.39 miles - 17 acres – 7% of the project
- 3. B Oak Woodland – 5.89 miles - 71 acres – 29 % of the project
- 3. C Mixed Forest – 4.35 miles - 53 acres – 21% of the project
- 3. D Oak Decline Restoration – 1.59 miles – 19 acres – 7.7% of the project
- 3. E High Quality Forest Products – 6.55 miles 79 acres 32% of the project
- 3. I Riparian Corridors – 0.13 miles - 2 acres -<1% of the project
- **Total 20.5 miles – 24.85 acres 100% of the project**
- Private – 3.23 miles – This proposal does exclude private land and private lands are not included in any of the calculations.

From Terrell Hope's (District Recreation Program Manager) past 20 years of experience, this portion of the Ozark National Forest receives minor to moderate pressure of dispersed recreational use. These uses include: camping, pleasure driving, hiking, horseback riding, OHV

use (dirt bikes and ATVs) and hunting (deer, squirrel, turkey, and bear). The area users are mainly visitors within a day's drive; however visitors from adjacent states also visit the area.

Even though the previous LRMP(1986) and the Revised LRMP (2005) restricted OHV use from general forest and closed roads, evidence of motorized use has remained moderate to heavy along portions of the power line.

General dispersed recreation abounds within and adjacent to the project area involving hunting, sight-sightseeing, hiking/brush whacking, and horseback riding cross country in addition to the following designations;

- State designated Scenic 7 Highway
- Moccasin Gap Campground and Trail system
- Proposed Wild and Scenic River "North Fork of Illinois"

Hunting for whitetail deer, squirrel and eastern wild turkey is a popular dispersed recreational activity in the general forested area. Evidence of dispersed camping can be found mostly from hunters, hikers or visitors seeking solitude with some sites inside or just outside the project area. These sites receive moderate use with the peak use in spring and fall. Other activities include recreational driving interior roads in passenger vehicles and ATVs, wildlife viewing and firewood gathering within the project area.

Equestrian use has a historical foundation within this area. Numerous local landowners ride throughout the project area on existing roads and cross country. Annually a local group sponsors a competitive horse ride in the Moccasin Gap area under a Recreational Event Special Use Permit usually the third weekend in April. The equestrian and motorized uses do conflict at times creating use conflicts but these incidents are rare. Currently, horse use and motorized use have created paths (undesignated/unauthorized trails) located throughout the general forest and along the power line and old woods roads (not drivable in a passenger vehicle). These created paths can and are degrading the power line corridor where high/continual volume of traffic is occurring, adding to the issue of unmanaged recreation. Most of the scarring from unmanaged use would recover in time if the use were stopped.

The effects on recreation can be described in terms of three principle components: the recreational activity, the setting in which it takes place, and the resulting experience. These three components make up the Recreation Opportunity Spectrum (ROS) that was originally completed in 1986. However, during each Environmental Assessment, ROS for the area is reviewed and updated as needed. The setting includes both environmental and social factors. The environmental setting is characterized by physical and natural features as well as the amount of apparent modification from human activity. The social setting of an area is characterized by the amount of contact among the visitors using it and the probability of their experiencing isolation from the sights and sounds of non-recreation human activity. The experience is the desired psychological outcome realized by participating in a preferred activity in a preferred environmental and social setting. Different combinations of these components provide a range of recreation opportunities. The ROS is a way to classify this range of opportunities and to identify the capability of the Forest to provide them. There are five classes of ROS in the Forest Plan: Semi-primitive non-motorized (SPNM), Semi-primitive motorized (SPM), Roaded Natural

(RN), Rural (R) and Urban (U). The Forest Plan objective is to maintain a balance of Recreation Opportunity Spectrum on the Ozark- St. Francis National Forests. This project area contains two of the five ROS classifications with the following lengths:

> **Rural** approximately 1.45 miles (6.2%) associated with the Scenic 7 Byway and State Highway 16 East
> **Roaded Natural** approximately 22 miles (93.8%) associated with the majority of the area along the main forest roads, the major drainages and ridges.

Rural and Roaded Natural settings represent the most developed sites and modified natural settings on the forest. Motorized use is permitted with moderate evidences of sights and sounds of man that usually harmonize with the natural environment. Evidence of vegetation management is acceptable because treatments are relatively short-lived, 3-5 years.

The vegetation of the area/corridor is predominately early stages grass, brush and saplings. The project visual landscape has been shaped from the past manual maintenance of the area. This resulted in a shift from more uniform canopy to an appearance of a linear field that is grown up, creating an unsightly brushy condition which limits viewing opportunities.

The RLRMP (pg. 2.20) priorities are to maintain or enhance the visual character of the Forest by establishing scenic integrity classes. The intent is to manage landscapes and use the best environmental design practices to harmonize changes in the landscape to reduce visual effects of management. The scenic class numbers range from 1 to 6 with 1 representing high public value and 6 as moderate/low public value which usually is found in unseen areas. A landscape architect was consulted as per FS Standard 110 found on page 3-15 of the RLRMP. The Landscape Architect's site specific project designs are incorporated in this EA (See Chapter II Section H. Site Specific Design Criteria).

The management area combined with the scenic class numbers identifies the Scenic Integrity Objectives (SIOs) for the Southwestern Power Project which is as follows;

* **High** (Appears Unaltered – Retention) Scenic integrity refers to landscapes where the valued landscape character "appears" intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident. Almost the entire project was identified as High, however, only (14.62 miles or 61%) of the foreground and middle ground along Scenic Highway 7, Old Highway 7, State Highway 16 and the proposed Wild and Scenic River are designated correctly with a High Scenic Integrity Objective.

The remainder is located in the general forest with no special designation and was incorrectly designated as high. The remaining 39% of the areas are seldom visible /unseen except by an occasional visitors hiking or riding through the back country. Less than 1% was identified with Moderate to Low Scenic Integrity Objectives.

*__Moderate__ – (Slightly Altered –Partial Retention) Scenic integrity refers to landscapes where the valued landscape character "appears slightly altered." Noticeable deviations must remain visually subordinate to the landscape character being viewed.

*__Low__ – (Moderately Altered- Modification) Scenic integrity refers to landscapes where the valued landscape character "appears moderately altered." Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes, or architectural styles outside the landscape being viewed.

The general landscape character of the project is predominately an open corridor through a mature forest canopy along with pastures and openings on private property. The RLMP has classified the scenic value for the majority of the project as High. It should be understood that Forest Plan mapping was completed using a "broad brush" approach and was mapped at a large scale over the entire Forest.

In the case of SIOs, Forest Plan mapping was based on foreground and middle ground from existing roads without consideration of topography, vegetation, or the amount or type of traffic the roads received. The Forest Plan mapped many areas as "seen or unseen" but did not include factors such as, terrain, viewer positions, land use, vegetative screening or frequency or type of traffic etc. that are considered at the project level. For that reason, areas that are located in unseen areas may be identified as Scenic Level High; these areas would receive standard project designs to achieve a more acceptable visual composition. Other areas in "seen" locations would each be identified with specific measures as needed based on the desired future conditions of the management area and scenic level. However, due to the land use being a power line corridor the use will never meet the criteria of High SIO. Specific timing of managing treatments may lessen visual impacts of proposals, but overall goal of an intact landscape will not be met.

The power line corridor that crosses the proposed Wild and Scenic River corridor totaling 0.6 miles or 7 acres was granted in 1947, and currently meets the criteria of Roaded-Natural. Visitors enjoy a natural setting although sights and sounds of human activity and motorized vehicles may be present. The landscape character is open with low ground cover of grasses, forbs, shrubs and saplings with a high scenic integrity. The present scenic integrity setting does not meet the ideal scenic criteria of human disturbance, and facilities that complement the natural environment. The "broad brush" approached overlooked the existing power line corridor since it was mapped at a large scale over the entire Forest.

Proposed Action and Alternative 1

The difference between the recreational and visual impacts of the Proposed Action and Alternative 1 is negligible so the effects were analyzed together.

Recreation
<u>Direct/Indirect Effects</u>
The proposed vegetation management activities include continuation of practices such as brush hogging, hazard tree cutting and/or herbicide use in order to maintain the current landscape

setting of low growing plants such as grasses, forbs and saplings. These activities would normally have a direct negative effect on the recreational setting, but the intent is to continue the current setting. The current classification for Roaded Natural and Rural expects forest visitors to encounter resource utilization while traveling Forest Service roads, hunting or while cross country hiking. Impacts are expected to be short-lived, 3-5 years. Indirectly, the areas where vegetation management activities take place could experience a temporary reduction in recreational use. Since the power line has been established and maintained for 67 years, there is expectancy within the public for the maintenance to continue. Therefore, recreational impacts from change in type (manual vs. herbicide) of maintenance are expected to go unnoticed. Unauthorized motorized recreational use may increase after operations are complete due to the area being more open. The PA and Alternative 1 maintain prime locations for hunting deer and turkey.

Page 2-37 of the RLRMP under Scenic sections of Wild and Scenic Rivers desired conditions states, "Vegetation management may be used for scenic enhancement or rehabilitation to provide wildlife viewing opportunities". It can be expected access to the above areas would be limited during the life of the operation, every 3-5 years. The limited access would create a direct temporary negative effect on recreation. Recreational use may increase after operations are complete due to the area being more open and accessible.

Cumulative Effects

The project area has limited access from a passenger vehicle; therefore, these proposals would not affect the overall managed recreational experience due to maintaining the corridor manually or with herbicides.

Scenery

Direct/Indirect Effects

The Proposed Action and Alternative 1 would increase temporary direct negative effects on the aesthetic and scenic quality in the area where activities are proposed. During implementation, and for a period of a few years after, the area of the proposed activities could look visually unappealing. Site specific project designs have been developed by a landscape architect and those designs are included in this analysis in Chapter II under "H Site Specific Project Designs." Additionally, they would be included in the decision if the Proposed Action or Alternative 1 is chosen. The site specific project designs would minimize the negative visual effects from the proposed activities.

Indirectly, with the project area corridor having activities proposed, fewer visitors may visit the area due to an increase in vegetation management work taking place. Visitors who do visit the area where activities would take place might not return for some time if they perceive the management activities as visually negative. The site specific project designs would minimize many of the negative visual effects by modifying the timing of treatment so they would have smoother transitions. The activities proposed would produce low growing plants such as grasses, forbs and saplings, and create wildlife viewing opportunities for short periods of time that may enhance the visitors' visual experience. These increased viewing opportunities would be available along roads.

Visually the activities' impacts would begin to lessen as vegetation growth covered disturbed areas. Based on ORA, Terrell Hope's past experience, it takes approximately three years after implementation (once treated area is vegetated) before the visual effects become negligible. The contrast in vertical and horizontal vegetation will be maintained, so a break in the continuity of the forest will be noticeable.

Cumulative Effects

The project area currently receives vegetative management occurring under the existing permit authorization The amendment to allow herbicide use would have no or little negative effects from the Proposed Action, since manual treatments are currently taking place with similar results. Therefore, the potential negative visual effects from the proposed action or continued use with manual treatments both have an immediate negative effect. Any negative visual effects become less evident as each growing seasons passes. These impacts would be lessened by site specific project designs that time treatment to spring up and just prior to leaf off.

D. VEGETATION

Present Conditions

For the purposes description and analysis, vegetation communities are divided into a series of ecological regions called ecoregions and habitat communities. An ecoregion (ecological region), is a geographically distinct assemblage of natural communities and species, covering a relatively large area of land or water (Wiken 1986, Omernik 1987, Commission for Environmental Cooperation [CEC] 1997). Ecoregion definitions were developed to separate the landscape into areas that have relatively similar characteristics of landform, land use, soil and historical natural vegetation (CEC 1997). In Arkansas, there are 7 Level III ecoregions (See Figure 2) and 32 Level IV ecoregions (See Figure 3). The Southwestern Power Administration Utility Corridor and Tower Site are located on the Big Piney Ranger District of the Ozark-St Francis National Forests in Arkansas which is located within the Boston Mountains Level III ecoregion. This Level III ecoregion is further divided into Upper Boston Mountains and Lower Boston Mountains Level IV ecoregion. The ecological communities or major forest types which are found within this ecoregion include Dry-Oak Forest and Woodland, Shortleaf Pine-Oak Forest and Woodland, Dry-Mesic Oak Forest, Mesic Hardwood Forest, Loblolly Pine Forest, and Riparian Forest. The following offers a description of each Level III and IV ecoregion and major forest type found on the Big Piney Ranger District.

Ecoregion III Boston Mountains

The Boston Mountains are mountainous, forested and underlain by Pennsylvanian sandstone, shale and siltstone. The maximum elevations are higher, soils have a warmer temperature regime and carbonate rocks are much less extensive than in the Ozark Highlands. Physiography is distinct from the Arkansas Valley with the upland soils being mostly Ultisols that developed under oak–hickory and oak–hickory–pine forests (Omernik 1987). The forests are still widespread across the ecoregion and commonly contain northern red oak, southern red oak, white oak and hickories in the uplands (Gerstacker 1881, USDA Forest Service 1999a, Lockhart et al. 1995, Harmon et al. 1996). Shortleaf pine grows on drier, south- and west-facing slopes underlain by sandstone. Pasture- or hayfields occur on nearly level ridgetops, benches and valley floors (USDA Forest Service 1999a). Population density is low; recreation, logging and livestock farming are the primary land uses. Water quality in streams is generally exceptional; biochemical, nutrient and mineral water quality parameter concentrations all tend to be very low (Woods et al. 2004).

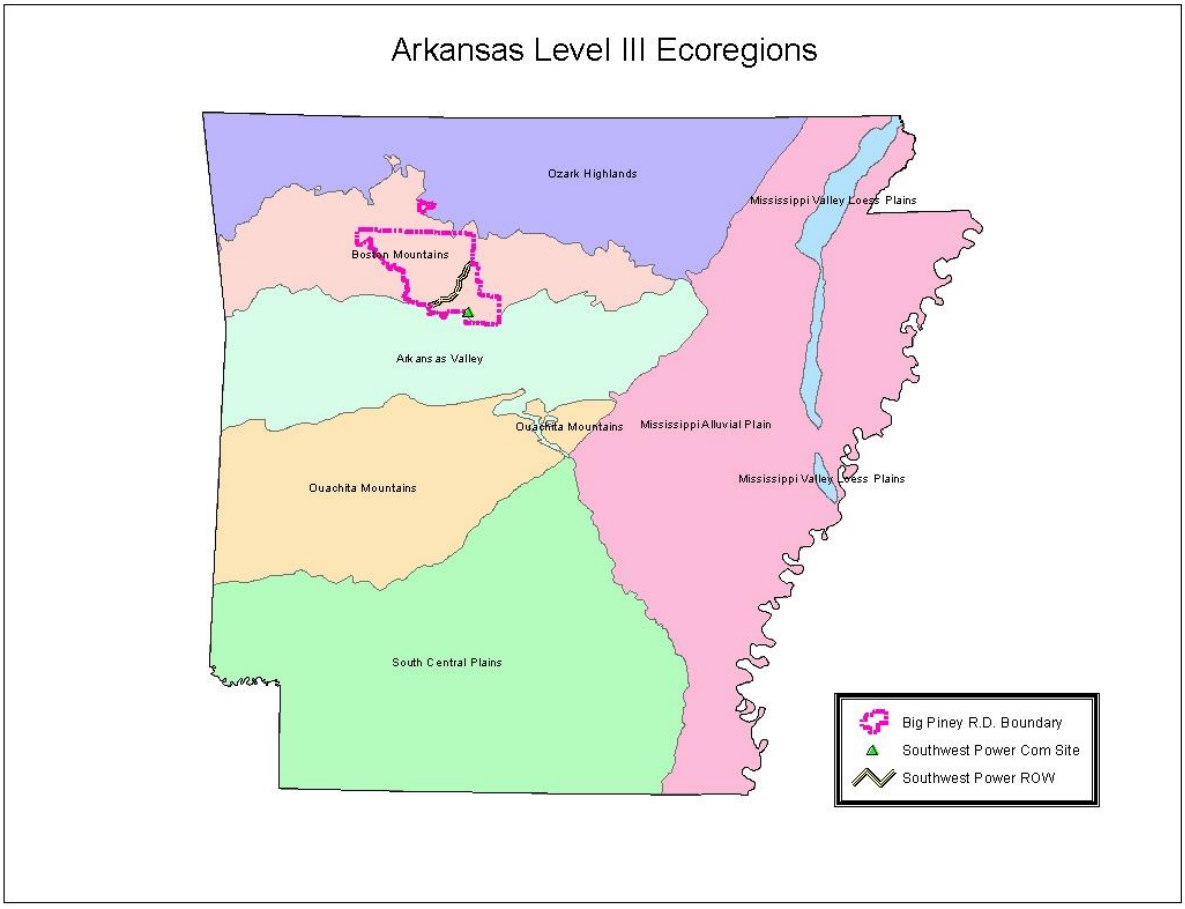

Figure 2: Arkansas Level III Ecroregions

Ecoregion IV Upper Boston Mountain
The Upper Boston Mountains are dissected, rugged mountains with steep slopes, sharp ridges and narrow valleys (USDA Forest Service 1999a,). Benches on the mountainsides occur frequently and are characteristic of the area. The Upper Boston Mountains ecoregion is generally higher and moister than the Lower Boston Mountains with elevations varying from 1,000 to 2,800 feet (USDA Forest Service 1999a). Mostly wooded, the Upper Boston Mountain region is composed of mixed deciduous forest and oak woodlands. The clearings are used as pasture or hayfields.

The major natural vegetation community of the Upper Boston Mountains ecoregion is oak–hickory forest. Northern red oak, white oak, pignut hickory and mocker nut hickory are dominate on upland areas. Sweetgum, willows, birch, American sycamore, hickories, southern red oak and white oak are found on narrow floodplains and low terraces (USDA Forest Service 1999a, Woods et al. 2004). The forests of the Upper Boston Mountains are more closed and contain far less pine than those of the Lower Boston Mountains. North-facing slopes support mesic forests. The ecoregion is underlain by Pennsylvanian sandstone, shale and siltstone (USDA Forest Service 1999a). Water quality in streams reflects geology, soils and land use, and is typically exceptional; mineral, nutrient and solid concentrations as well as turbidity all tend to be very low. Summer flow in many streams is zero or near zero (Woods et al. 2004, USDA Forest Service 1999a).

Ecoregion IV Lower Boston Mountain
The Lower Boston Mountains are characterized by low mountains, rounded high hills and undulating plateaus. The ecoregion contains moderately-to-highly dissected high hills containing steep slopes and significant local relief and elevations of up to 1000 feet (Ozark Ecoregional Assessment Team 2003). The Lower Boston Mountains ecoregion is a mosaic of woodland, forest and savanna that contrasts with the denser, moister and more closed forests of the Upper Boston Mountains. Mostly forest and woodland; the ecoregion becomes more open to the west. Flatter areas are used as pastureland or hayfields (USDA Forest Service 1999a, Woods et al. 2004).

The natural vegetation of the Lower Boston Mountains ecoregion is oak–hickory–pine and oak–hickory forests. Mixed oak and oak-pine forests, woodlands or savanna occur on uplands. Northern red oak, white oak, post, scarlet, black, blackjack oak, pignut hickory, shagbark hickory, mocker nut hickory and shortleaf pine are the dominant native tree species of the area. On lower, drier south- and west-facing sites shortleaf pine dominates. On narrow floodplains and low terraces, sweet gum, willows, birch, American sycamore, hickories, southern red oak and white oak are common (USDA Forest Service 1999a, Woods et al. 2004). The ecoregion is underlain by Pennsylvanian sandstone, shale, chert and siltstone (USDA Forest Service 1999a). Summer flow in many streams is zero or near zero, but enduring pools fed by interstitial flow do occur (Woods et al., 2004, USDA Forest Service 1999a).

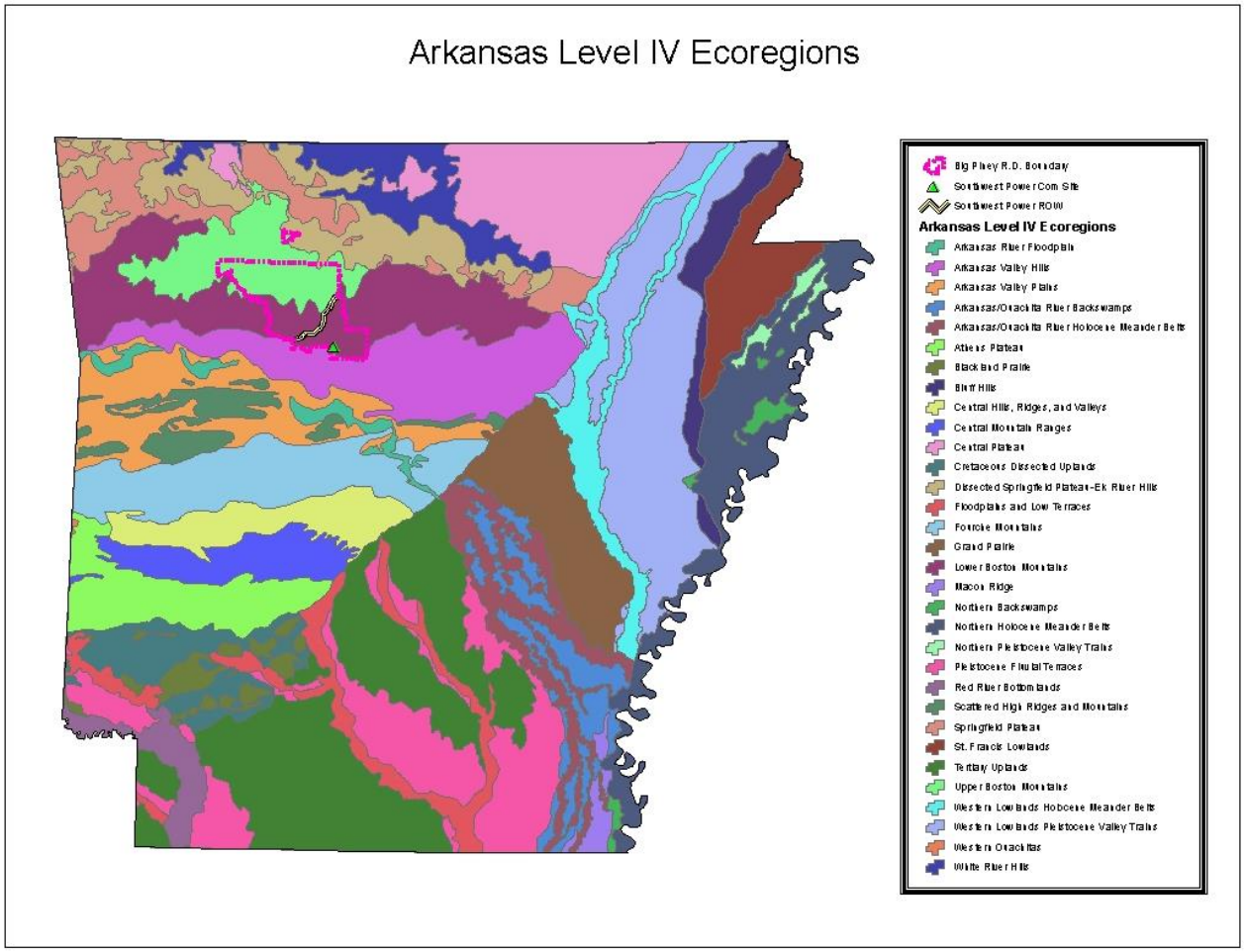

Figure 3: Arkansas Level IV Ecoregions

Ecological Communities/Major Forest Types Found in Project Area (Figure 4 and Figure 5)

Dry Oak Forest and Woodland

The Dry Oak Forest and Woodland community is comprised of forest and woodland with canopies dominated (>50%) by post oak, blackjack oak, and/or block oak. It also includes forests and woodlands dominated (>50%) by other oaks and/or hickories (typically white or northern red oak) where they occur on xeric and dry sites. Minor components (< 30% of canopy) of shortleaf pine may also be present.

This community is commonly found on xeric and dry sites, typical of ridges and steep south and west aspects. It may also be found on gentler slopes and flats where soil types result in xeric and dry conditions. The community may also occupy mesic sites where frequent fire has influenced community composition, resulting in dominance by post, blackjack, or black oaks (USDA Forest Service 2005).

Shortleaf Pine-Oak Forest and Woodland
The Shortleaf Pine-Oak community is comprised of forest and woodland canopies dominated (>50%) by shortleaf pine. A variety of oaks, including post, blackjack, white, and northern red oaks are also often found within the canopy. *Vaccinium* and bluestem grasses are typical understory components.

The community is commonly found on xeric and dry sites, typical of ridges and steep south and southwest aspects. It may also be found on gentler slopes and flats where soil types result in xeric and dry conditions. The community may also occupy mesic sites where frequent fire has influenced community composition, resulting in dominance by shortleaf pine and fire tolerant oak species (USDA Forest Service 2005).

Dry-Mesic Oak Forest
The Dry-Mesic Oak Forest community is defined as forests with canopies dominated (>50%) by oak species, but which are not on xeric or dry sites, and which are not dominated (>50%) by post, blackjack, or black oaks. Shortleaf pine comprises less than 50% of the canopy. Midstory and understory associates vary widely, but frequently include maple, dogwood, and hickory. This community is commonly found on a variety of sites ranging from dry to mesic. It may be found on a variety of topographical positions including riparian areas (USDA Forest Service 2005).

Mesic Hardwood Forest
The Mesic Hardwood Forest community comprised of forests with canopies dominated (>50%) by American beech, magnolia, maple, and/or walnut. It also includes forests dominated by sweetgum when not in floodplain sites. It may include a significant component of mesic oak species. This community is commonly found on lower slopes and north aspects but may also be found on riparian or floodplain sites (USDA Forest Service 2005).

Loblolly Pine Forest
The Loblolly Pine Forest Community is comprised of forests with canopies dominated by loblolly pine. Loblolly pine is not native to the Ozark or St. Francis National Forests. These forests are plantations established outside of the natural range of this species. Although they are plantations, they have not typically been managed as monocultures; therefore, diversity of other canopy species may range from low to high and include a variety of species (USDA Forest Service 2005).

Riparian Forest
The Riaprian Forest community is comprised of forests with canopies (>50%) by ash, elm, sycamore, river birch, sugarberry, cottonwood, willow, and/or other trees typical of riverfront or floodplain forests. It includes forests dominated by sweetgum when on floodplain sites. Willow oak, laurel oak, and water oak may be components.

This community is commonly found on floodplains of larger streams and rivers. The forest community type of Riparian Forest should not be confused with riparian ecological site type or riparian management areas. Other community types such as Dry-Mesic Oak Forest and Mesic Hardwood Forests may also occur on riparian sites or in riparian management areas (USDA FOREST SERVICE 2005).

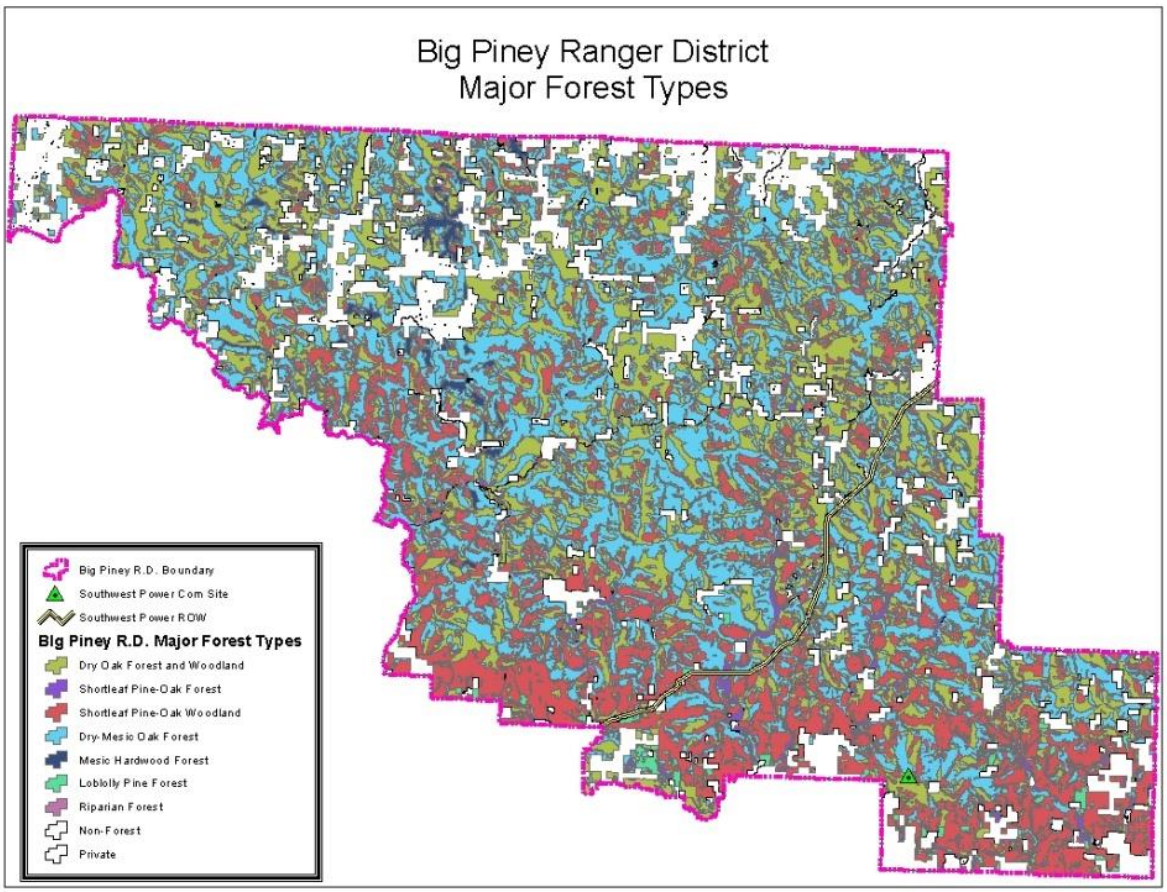

Figure 4: Map of Major Forest Types on Big Piney Ranger District

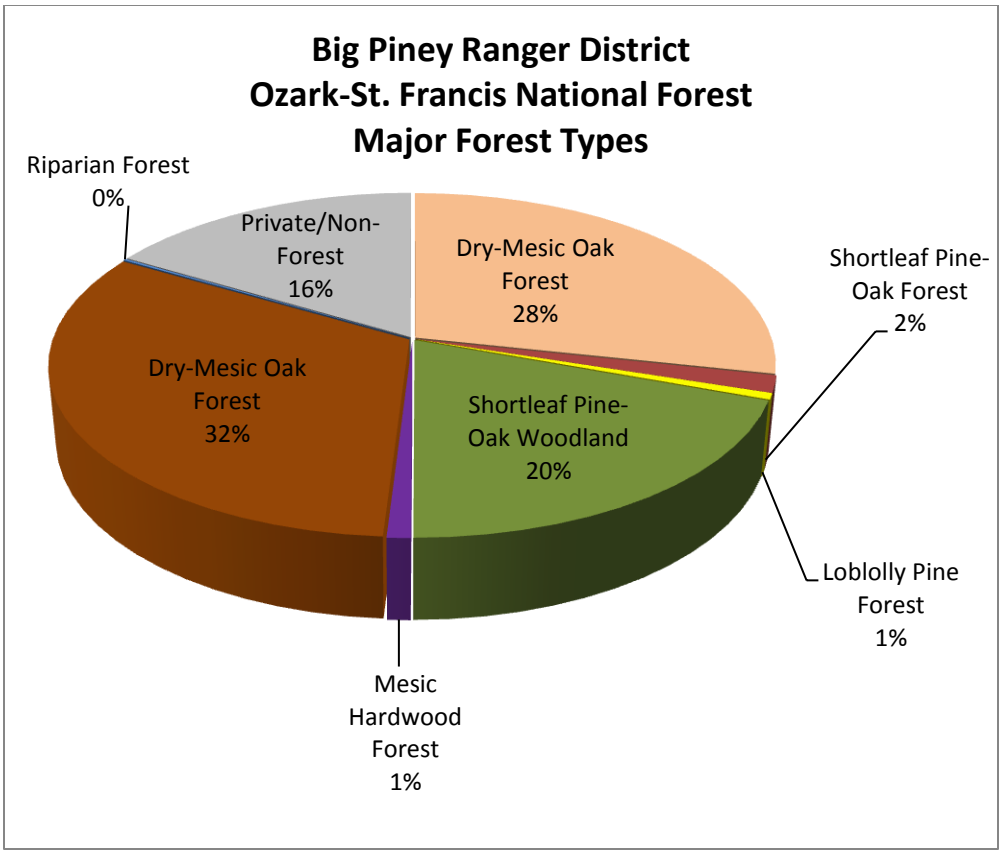

Figure 5: Chart Showing Distribution of Major Forest Types on Big Piney Ranger District

Invasive species is one of the four threats to the health of the National Forests and Grasslands identified by former Forest Service Chief Dale Bosworth. An invasive species is identified as "[a] species that can move into an area and become dominant either numerically or in terms of cover, resource use, or other ecological impacts. An invasive species may be either native or non-native" (USDA-Forest Service 2005a p. 132; USDA-Forest Service 2005b p. 172).

Invasives destroy fish and wildlife habitats, alter nutrient cycling and natural fire regimes, and can reduce biodiversity and degrade native ecosystem health. Infestations of invasive plants have reached epidemic proportions, spreading rapidly over hundreds of millions of acres, across all landscapes and ownerships. Invasive forest diseases, such as Chestnut Blight, wiped out entire forest species in the East (i.e., the American Chestnut) and Dutch Elm disease virtually eliminated an urban forest tree - the American Elm. Invasive Species pose a long-term risk to forest health. These species interfere with natural and managed ecosystems, degrade wildlife habitat, reduce the sustainable production of natural resource based goods and services, and increase the susceptibility of ecosystems to other disturbances such as fire and disease. There are several non-native invasive plant species known to occur throughout the Big Piney Ranger District and could be present within Southwestern Power Administration Utility Corridor and Tower Site project areas. These species include shrubby Lespedeza (*Lespedeza bicolor*), Chinese Lespedeza (*Lespedeza cuneata*), Royal Paulownia- (*paulownia tomentosa)*, privet (*Ligustrum spp.*), Japanese Honeysuckle (*Lonicera japonica)*, Nonnative Rose (*Rosa multiflora*),

Mimosa (*Albizia julibrissn*), Tree of Heaven- (*Ailanthus altissima*), and Japanese stiltgrass (*Microstegium vimineum)*.

There is a need to conserve the native biological diversity of plant communities, species, and populations. It is necessary to prevent the displacement of native species and the disruption of plant communities through the introduction of aggressive, persistent, self-replicating, long lasting non-native vegetation into managed or natural plant communities.

Effects of Management Activities Vegetation

Proposed Action

Direct Effects
Under this alternative, woody species such as small trees, brush, and vines would be targeted from removal from within the 248.5 acres of utility corridor and 1 acre tower site. Low-growing plant communities such as grasses and forbs would be favored and promoted with the use of selective herbicides. By favoring low-growing plant communities, the utility corridor and tower site would retain vegetative cover over the soil. The roots of the vegetative material serve to hold the soil together and reduce soil run-off and erosion. Application of herbicides to treat the utility corridor and tower site would be done using manual or hand application techniques. No motorized application methods would be permitted. By reducing or eliminating the need for heavy equipment travel within these areas, soil compaction would be reduced.

There would be no direct effects to forest composition or structure outside the ROW under this alternative. The utility corridor and tower site are currently being maintained using mechanical equipment such as brush hogs, mowers, and other heavy equipment. The proposed action favors grasses and forbs over woody vegetation.

Under this alternative, woody species and NNIS populations would be treated where they occur within the utility corridor and tower site. This would aid in the re-establishment of herbaceous native plant communities across the project area. Because some species have persistent seeds that remain viable in the soil for years, monitoring would determine the effectiveness of the treatments and if further treatments would be required.

Indirect Effects
The use of herbicides would typically result in a brown-up of the treated vegetation several days to weeks following the application. When brown-up occurs this typically causes a hard visual edge to form between the “green” untreated areas and the “brown” treated areas which could detract from the visual quality of the surrounding area. Mechanical treatment methods such as brush hogging or mowing do not typically cause a brown-up of foliage because they cut, chop, and disperse the vegetation. There is a noticeable edge from the different heights and structure of vegetation from untreated to treated areas, but little brown discoloration is noticeable.

Over time, through the use of selective herbicides, the amount of woody and herbaceous vegetation within the project areas would be reduced. The amount of low-growing grass and

forb plant communities would begin to dominate and out-compete woody trees and brush. This would reduce the frequency of treatments needed to control vegetation within the project areas.

Once NNIS populations are reduced or eradicated, plant diversity would be re-established from existing native seeds in the soil and from adjacent areas. Grasses, forbs, or other early-seral vegetation would recover within treated areas within the first growing season (typical for recovery on most sites) while abundance and diversity of native vegetation would increase over subsequence years. Re-establishment of native vegetative cover is key to prevent the re-infestation of NNIS populations.

Cumulative Effects

Reduction of NNIS would allow native species that had been temporarily lost from the habitat to become re-established. Treating existing populations of NNIS would allow native vegetation to become re-established and reduce or eliminate the establishment or spread of any future infestations of NNIS. The control of NNIS with herbicides under the Proposed Action combined with actions of previous decisions which are in proximity to the utility corridor and tower site would reduce or eliminate the population and spread of NNIS present across an increased area of the Big Piney Ranger District. Once NNIS populations are reduced or eradicated, plant diversity would be re-established from existing native seeds in the soil and from adjacent areas. Grasses, forbs, or other early-seral vegetation would recover within treated areas within the first growing season (typical for recovery on most sites) while abundance and diversity of native vegetation would increase over subsequence years. Re-establishment of native vegetative cover is key to prevent the re-infestation of NNIS populations.

Alternative 1: No Amendment

Direct Effects

The No Amendment Alternative would require vegetation within utility corridor and tower site to be managed by mechanical means only. Mechanical methods are very effective for completely removing thick stands of vegetation. However, the heavy equipment techniques are non-selective in that they cut all vegetation within the path of the machine, therefore, sensitive plant species inhabiting the utility corridor, if any, would potentially be at risk of disturbance. Mechanical methods of utility maintenance may also cause the compaction and or erosion of soil from heavy equipment (Neary and Michael 1996), subsequently creating negative impacts to the vegetation community.

Mechanical methods for utility maintenance are also ineffective at controlling non-native invasive plants and are known to facilitate their spread (Miller 2004). The techniques used with mechanical utility maintenance such as brush hogging or mowing scatter and disperse the seeds of NNIS and often lead to re-sprouting of the parent plant. Also, some species have persistent seeds that remain viable in the soil for years. Little to no control of existing NNIS population could be expected under this alternative.

Indirect Effects

Successive mechanical mowing/cutting may significantly increase the amount and difficulty of labor needed to complete vegetation control. When deciduous tree species are cut, the stems re-

sprouts with several shoots, creating even more dense vegetation than what existed before maintenance occurred. The resulting dense woody vegetation may prevent the establishment of other plant species, such as grasses and perennial plants, which do not require frequent maintenance. Rapid re-growth of woody vegetation necessitates re-treating the same area approximately every two to three years, creating a constant cycle of disturbance. As has been mentioned, the repeated disturbance from heavy equipment along the same area of ground increases the potential for compaction and erosion of soil.

As discussed in the direct effects section, mechanical methods such as brush hogging and mowing only serve to spread the population of NNIS. Under this alternative, no herbicides would be used to control NNIS populations within the utility corridor and tower site. Repeated mechanical treatments would only perpetuate and spread existing NNIS populations that occur within the project area to other areas within the utility corridor and tower site or into previously un-infested areas.

Cumulative Effects

The past, present, and future management actions from previous management decisions surrounding the utility corridor and tower site allow for the use of herbicides to control NNIS populations. Activities such as road maintenance, recreation, and camping could transport the NNIS to uninfected areas across the landscape. By not allowing the control of NNIS populations with herbicides and continuing mechanical treatments such as brush hogging and mowing, any existing populations of NNIS could increase and be spread throughout the utility corridor and tower site. Due to the lack of effective control of NNIS, these areas could serve as a travel route or highway for NNIS populations to spread and infest new areas on the forest or private lands.

F. WILDLIFE

Existing Condition

The project area contains a wide variety of habitats within the greater Boston Mountains and the Lower Boston Mountain eco-region. Within this region is a variety of ecological communities supporting an abundance of wildlife species. The occurrence and distribution of wildlife species within the project area is dependent upon the regional and local terrestrial and aquatic habitats available.

The large relatively un-fragmented blocks of natural habitats found in the Ozark – St. Francis National Forests represent some of the last and best examples of native ecosystems in the region. For this reason, they are havens for native flora and fauna including many species that are rare and declining. The 100-foot wide power line corridor is pre-existing and will not add additional fragmentation to the adjacent forested habitats. These lands are especially important to species requiring large areas of undeveloped habitat (such as black bear [*Ursus americanus*]) and species requiring large blocks of mature forest (such as some forest songbirds). Common terrestrial game species within the Ozark – St. Francis National Forests include black bear, deer, elk, squirrel, turkey, and quail.

Threatened, Endangered, or Sensitive (TES) plants and animals known to be in the project area will be considered in detail in the Biological Evaluation (BE), and a summary of potential effects can be found in the TES section of this EA.

The Forest Service as an agency recognizes the Syracuse Environmental Research Associates (SERA) ecological risk assessments as the source for evaluating herbicide impacts on the forest. More discussion on herbicides will be found in the project alternatives below.

Management Indicator Species Analysis

Management Indicator Species (MIS) are a planning and monitoring tool that reflects a way to analyze a change in conditions. The list in the Table 13 provides information on the current conditions for the 17 MIS chosen for the Forest. The latest analysis of MIS data was used in the evaluation of the proposed action and alternative.

Table 13: Management Indicator Species for the Ozark-St. Francis National Forests

Northern Bobwhite *(Colinus virginianus)* – For the Forest, oak savanna and woodland, restored glades, native fields, early seral forest (0-5) and thinned and burned forest areas. This species is at historic lows on the forest. Long term Breeding Bird Surveys across this species entire range show a marked decline. Classification: High Disturbance Species (HDS).
White-tailed Deer (*Odocoileus virginianus*) - For the Forest, the preferred habitat for deer can be described as areas of mature hardwood, hardwood-pine and pine-hardwood stands, which provide hard and soft mast, with 0-5 year old regeneration areas, food plots, oak savannas and woodlands and permanent water sources intermixed. The regeneration areas, savanna and woodlands provide cover and along with food plots provide forage. The population appears to be stable on the Ozark National Forest. Classification: HDS
Black Bear (*Ursus americanus*) - On the Forest, the preferred habitat for bear can be described, as areas that are relatively isolated from human disturbance, comprised of mature hardwood, hardwood-pine and pine-hardwood forest types that provide hard mast, with 0-5 year old regeneration areas and food plots intermixed to provide cover, forage and soft mast. The numbers of bears remain high on the Ozark National Forest and continue to be stable to increasing. Classification: HDS
Eastern wild turkey (*Meleagris gallapavo*) - The preferred habitat for wild turkeys can be described as mature hardwood or hardwood-pine stands with open areas (fields, food plots or natural openings) nearby and a permanent water source readily available. Habitat is wide spread on the forest, but recent surveys indicate decline. Classification: HDS
Prairie Warbler *(Dendroica discolor)* - Optimal habitat conditions include early seral habitat, regeneration areas that are in the 5-20 year old age class, pine-bluestem and oak savanna/woodland habitats. Species monitoring indicates declining trend for this physiographic region. Classification: HDS
Yellow-breasted Chat (*Icteria virens*) - On the Forest, the preferred habitat for the chat can be described as regeneration areas and other openings with 1-3 m (3-10 ft) tall brushy vegetation. Identified in RFLRMP as MIS for the St. Francis NF. Classification: HDS

Table 13 (Cont'd): Management Indicator Species for the Ozark-St. Francis National Forests

Brown-headed Nuthatch *(Sitta pusilla)* - This species is tied to mature open pine stands or pine woodland conditions. The upland Ozarks fall outside of this species range although it is possible that historically it was more widespread where mature pine stands once occurred. This species is rare on the Forest. Classification: HDS
Northern Parula *(Parula americana)* – Habitat is typically mature, moist forests along streams and within riparian areas. Commonly found along Ozark wooded rivers and streams. On the Ozark National Forest, this species appears to be stable to slightly declining. Classification: Low Disturbance Species (LDS)
Rufous-crowned Sparrow *(Aimophila ruficeps)* – A very small population occurs on Mt. Magazine in Logan County. It is primarily a species of the desert southwest. Habitat would include glades or thin shrub/seedling stands with sparse grasses and shrubs. Classification: LDS
Cerulean Warbler *(Dendroica cerulean)* – The Arkansas Ozarks are on the southern edge of this species range. Primary habitat includes rich mature forest with mesic to wet conditions. Typically they have larger diameter trees with a defined shrub layer. More commonly found in bottomland hardwoods, but on the main division of the forest in upland habitats. This species is declining over its range but on the Ozark National Forest, it appears to be fairly stable. Classification: LDS
Red-headed Woodpecker *(Melanerpes erythrocephalus)* – Preferred habitat would include open woodlands or pines. Requires dead trees and snags for nesting. Species is uncommon on the Forest. On the Ozark National Forest, this species has increased. Classification: HDS
Ovenbird *(Seiurus aurocapillus)* – Typical habitat would include mid to late seral dry-oak deciduous forests with limited understory. Nesting occurs on the ground. Species well distributed in the Ozark Uplands. This species is common on the Ozark National Forest but has shown some decline. Classification: LDS
Pileated woodpecker (*Dryocopus pileatus*) - The preferred habitat for the pileated woodpecker can be described as mature stands of any species or species mix with large dead snags and woody debris on the forest floor. USFWS Breeding Bird Surveys show this species is decreasing for this physiographic region. Classification: LDS
Scarlet Tanager *(Piranga olivacea)* – Mature deciduous forest and rich upland forest is the preferred habitat for this species. In suitable habitat this species is not uncommon on the Forest. Long term Breeding Bird Surveys for indicates a decline overall for AR but is slightly increasing on Forest. Classification: LDS
Acadian Flycatcher *(Empidonax virescens)* – Prefers moist deciduous forest near streams and bottomland hardwoods. Not uncommon and increasing on the Ozark NF in riparian areas but declining overall. Classification: LDS
Small-mouth Bass *(Micropterus dolomieui)* - Cool, clear, mid-order streams, greater than 10.5 m (35 ft), wide with abundant shade, cover and deep pools, moderate current, and gravel or rubble substrate characterize optimum riverine habitat. The largest stream populations of smallmouth bass occur in streams with gradients of 0.75-4.70 m/km, (3-15 ft/mi) that provide alternating pools and riffles, support. Standing crop is generally largest in pools deeper than 1.2 m (4 ft.). In suitable habitat this species is indicative of high water quality. The relative abundance of this species in streams on the Ozark National Forest is considered normal.

Table 13 (Cont'd): Management Indicator Species for the Ozark-St. Francis National Forests

Largemouth Bass (*Micropterus salmoides)* – prefers larger ponds, lakes, reservoirs, slough and river backwaters. Usually found close to shore in lakes and reservoirs. This species prefers warm quiet waters with low turbidity, soft bottom and beds of aquatic plants. For lakes on the Forests, the overall relative weights, PSD, and RSD for largemouth bass stayed fairly stable from 2005 to 2010, but the relative weight continues to be below the expected value for an ideal largemouth bass fishery.Warm

The Yellow Breasted Chat is identified in the Forest Plan as an MIS for the St. Francis NF, and the Rufous-crowned Sparrow's occurrence on the Forest is limited to an area on the Mt. Magazine Ranger District.

A more complete description of the habitat relationships for these species can be found in the Nature Serve database: http://www.natureserve.org/ , and a Land Manager's Guide to Birds of the South: http://www.srs.fs.usda.gov/pubs/2702

Proposed Action (PA)

The Human Health and Ecological Risk Assessments completed by the USDA, Forest Service www.fs.fed.us/foresthealth/pesticide/risk.shtml (see individual SERA s) indicate that the proposed herbicides are either nontoxic or of low toxicity to birds, mammals, and insects. Only herbicides with aquatic labels may be used near water. Terrestrial animals may be exposed to herbicides by way of the following examples: direct spray, contact with sprayed vegetation, or ingestion of contaminated vegetation, water, or insects. Non-target species may be impacted by drift or run-off.

Toxicity is generally tested at rates above label application rates. In order to reduce potential adverse effects to non-target species, the herbicides would be applied according to label specifications, would be largely target specific by using methods such as backpack spraying, and would be applied using the guidelines in the Forest Plan.
Specific Herbicides (Does not apply to Alternative 1)

Glyphosate – is used to control post-emergent vegetation. It functions by interrupting the production of aromatic amino acids. The two main formulas of glyphosate are Rodeo and Accord whose toxicity is rated as low and have had extensive studies. Glyphosate by itself is of relatively low toxicity to birds, mammals, and fish; however, formulations that include surfactants have shown high impacts to aquatic systems affecting amphibians in particular. Only formulations with aquatic labels are proposed for use in aquatic systems. Glyphosate is absorbed through the leaves and bark and is not soil active; however, some grasses and forbs may be affected due to drips or drift. Residues of glyphosate are expected to be immobile in soil (RED Facts, 1993) and remains bound to soil particles until it is degraded.

Triclopyr – has two different forms: a salt and an ester. It functions by mimicking a growth hormone disrupting normal plant development. Both forms are only somewhat persistent in the environment and degrade by exposure to light or soil microbials (Red Facts, 1998). In general, the ester formulation is more toxic than the salt form with larger mammals being more sensitive

than smaller mammals. The ester formulation would be used for basal spray application only. This method would require less of the herbicide to control the woody species than foliar spray. Triclopyr is classified as being practically non-toxic to slightly toxic to birds. Although the ester formulation poses more of a toxicity risk to fish, it will not persist in surface water and would have minimal long-term risk. The highest risk to aquatics would be a direct spill in large amounts. Only sufficient herbicide to accomplish the day's work would be transported to the site.

Metsulfuron methyl - is used to control pre and post emergent annual weeds, perennial weeds, and woody plants. It functions by inhibiting an enzyme involved in making chain amino acids. Metsulfuron methyl is of low toxicity to practically nontoxic for birds, mammals, fish, and bees.

Imazapyr –is used for the control of terrestrial and aquatic vegetation such as grasses, broadleaf weeds, vines, and brush. It functions by inhibiting an enzyme involved in making chain amino acids. It is hazardous to both terrestrial and aquatic macrophytes but practically non-toxic to mammals, birds, bees, fish, aquatic invertebrates, and algae. Some formulations can cause eye irritation or damage. There is little information on the toxicity to reptiles, terrestrial and aquatic-phase amphibians, and microorganisms.

Imazapyr and Metsulfuron methyl are persistent and mobile in soil. Their ability to affect broad leaf and their half- life depends on when you spray. Early in the growing season their half-life would be a few months due to temperatures; however, if sprayed late in the growing season close to fall, lingering active ingredients may still affect plants next spring. Metsulfuron methyl half-life estimates range from 14-180 days. Imazapyr's half-life can be up to seven months and more in dry conditions. Only sufficient herbicide to accomplish the day's work would be transported to the site.

Direct/Indirect Effects

The proposed use of herbicides in the PA to control undesirable non-native invasive species (NNIS) would improve wildlife habitats for both LDS and HDS species. Noxious weeds are displacing native plant species. Control of NNIS would protect the quality and availability of foraging habitats. Species such as *Serecea* and tree of heaven are prone to spread into areas where disturbances occur and decrease diversity. The proposed herbicide treatments would impede the expansion of NNIS in the project area and potentially eliminate some of the seed source.

The Proposed Action is to use Forest Service-approved herbicides to control specific woody stem vegetation within the project area. Application of herbicide mixtures would be by individuals walking along the Transmission Line #3001 ROW and within the footprint of the White Oak Station (WO station), using low-pressure backpack sprayers to apply herbicide to target woody stem vegetation only. The Proposed Action would seek to promote the establishment of low-growing plant communities, such as grasses, within the project areas and the removal of large woody stem vegetation that interferes with electrical power transmission lines and access requirements.

The 100-foot wide power line corridor and the WO station are pre-existing and will not add additional fragmentation to the adjacent forested habitats; however, under the proposed action the structure within the power line corridor and around the WO station will shift toward a more

herbaceous grass and weed component with reduced large woody shrub component. The Proposed Action would not be anticipated to impact transitional edges which are associated with predation and parasitism (USFS 2005b, pg. 3-289). Edge effects, where the ROW transitions into the forest, would be the same as is currently experienced. No additional edge would be created, and land use designation within the ROW would not be changed. Low disturbance MIS that rely on mature successional habitat components, such as the scarlet tanager, would not suffer any additional adverse edge effects due to implementation of the Proposed Action due to the fact that analysis area ROWs are pre-existing.

Studies of bird species within power line corridors indicate that the diversity of early successional species may increase along these corridors, but the presence, abundance and nest success of individual species may be influenced by corridor width, diversity of vegetative structure and density, and the proximity to agricultural or urban landscapes (Confer and Pascoe 2003, Askins et al 2012, & Chandler et al 2009). Some avian high disturbance species (HDS) may gain or lose habitat in the project area due to the shift in shrub density and height; however, not all high disturbance species will be affected by this management because of other limiting factors such as uniform corridor width.

HDS that utilize a mosaic of habitats such as deer and bear will likely continue to benefit from power line maintenance. Although the shrub component will be decreased in the future, the selective herbicide application will maintain a low shrub component without completely mowing all existing vegetation at once which eliminates a resource for an extended period of time. Although some animals will continue to be hindered by the presence of the corridor, other animals that require cover to move through power line corridors will not be periodically cut off as after current mowing practices. Species such as turkeys that incorporate insects into their diet are likely to use these corridors for foraging due to increased mobility and the variety of insects hosted by their preferred grasses, forbs, and shrubs.

Reduced mechanical presence would benefit both HDS and LDS by decreasing vehicle mortality, noise disturbance, sensitivity to exposure, and habitat degradation such as ruts and soil compaction.

Cumulative Effects

Current and planned projects adjacent to the project area are listed in Chapter 2 of this document. Adjacent projects' herbicide application is dispersed across the landscape; however, some of this acreage is in direct contact with the power line corridor. Forest Service herbicide treatments exclude the power line corridor during application; therefore, the same ground will not receive multiple applications from different sources. Forest Service management standards limit the application of vegetation management practices, and other management practices, in the area of Streamside Management Zones (SMZs). On the power line corridor/White Oak station there will be one application of herbicide per treatment year with each treatment spaced out every 3-5 years. If herbicides are applied according to the labels and FS standards, no cumulative effects are expected from the rate of application.

Treatments to FS projects adjacent to the power line corridor may increase the benefits to some HDS by increasing patch size and/or reducing edge effect; conversely, LDS habitat will likely be

reduced within these general areas. Restoration of grassy (savanna-type) habitat, through reduction of trees in the project areas and development of native grass cover, would benefit several avian species of concern such as northern bobwhite, red-headed woodpecker, Bewick's wren, Bachman's sparrow, and prairie warbler. Overall, the indirect and cumulative effects under this alternative on quail as an MIS would be very beneficial because of the improved habitat quality in this ecosystem, which currently has very little quality quail habitat. More common birds such as northern flicker, red-tailed hawk, and eastern bluebird would also benefit (USFS, 2005a).

The Proposed Action would provide long-term beneficial cumulative effects to species near or traversing the project areas as the use of heavy equipment for vegetation maintenance would be replaced with less intensive hand-spraying operations. In addition, the Proposed Action would adhere to all FW Management Standards and the Project Specific Design Criteria as described in Section 2 of this EA. Because the Proposed Action would utilize foot access for treatment activities versus heavy mechanical equipment, the use of herbicides would minimize disturbance of species.

Treatment of NNIS over time would help eliminate some seed sources and reduce the rate of spread. As native grasses and forbs become established, these native seeds would be available for disbursement and forage.

Alternative 1: (No Amendment)

Direct/Indirect Effects

Under the No Amendment Alternative, current management plans under the existing Special Use permits would continue to guide vegetation management within the project area. Mechanical methods of vegetation control would continue to be utilized including the use of various types of heavy equipment such as chainsaws, mowers, brush hogs, tractors, large trailers for hauling equipment, and helicopters for aerial side trimming.

Many fish and wildlife species are highly sensitive to disturbance and noise associated with heavy equipment activity. The use of heavy equipment can produce high levels of noise for short periods of time which may disturb wildlife and aquatic species causing most to flee the area due to the approach of heavy equipment. However, slow-moving species and nesting young remain at risk from impacts with the equipment. In addition, aquatic species are highly susceptible to disturbance and siltation of their aquatic habitat. Generalized cutting with heavy equipment is very effective in controlling woody vegetation; however, the same cutting techniques can directly impact species by inadvertently crushing or chopping individuals or nests, or causing individuals to flee or abandon their nests. Wildlife species are thus at risk of disturbance, injury or death from impact with the heavy equipment.

The No Amendment Alternative would not be expected to impact transitional edges which are associated with predation and parasitism (USFS, 2005b). Edge effects, where the ROW transitions into the forest, would be same as is currently experienced. No additional edge would be created and land use within the ROW would not be changed.

The No Amendment Alternative would not alter existing vegetation outside of the Transmission Line #3001 ROW and White Oak Station footprint, and would not adversely impact existing habitat or populations of wildlife species including game species. No direct or indirect impacts to these existing resources are expected as a result of the No Amendment Alternative.

Cumulative Effects

Current and planned projects adjacent to the project area are listed in Chapter 2 of this document. Some of the previously managed lands, both FS and private, have created habitat for HDS. Sustainability of current conditions would perpetuate some benefits. Forest trends are likely to follow the current trends; i.e. prairie warblers, quail, and turkeys would continue to decline; and deer, bear, pileated woodpeckers and scarlet tanagers would remain stable.

Although the use of heavy equipment for vegetation maintenance may temporarily degrade wildlife habitat in the project area and directly affect individuals or nests, this impact would be temporary, limited to the timeframe of the mechanized clearing activity itself; therefore, no measureable adverse cumulative effects to wildlife and fish populations' viability within the project area are anticipated.

Species Trend Effects:

Overall, the indirect and cumulative effects of the Proposed Action on quail as an MIS would be very beneficial because of the improved early successional and woodland habitat in this ecosystem, which currently has very little quality quail habitat. The No Amendment would not address the preference for open grassy habitat, and the population would remain steady or continue to decline.

Herbicides are considered to be of low toxicity to mammals, and there should be no substantial differences in effects between the No Amendment and the Proposed Action on MIS white-tailed deer. Black bears which are more sensitive to human disturbance would benefit slightly more from the Proposed Action. Both of these MIS species are expected to remain steady or slightly increase.

Proposed herbicides are considered to be of low toxicity to birds and could help create and maintain a variety of early successional habitat. These areas are an important part of balanced turkey habitat, providing bugging and foraging grounds for young poults and brushy nesting sites for adults. With sustained forest health and habitat diversity, the turkey population should remain stable or increase with this alternative. In addition, the trend for prairie warblers and brown headed nuthatches are expected to remain steady or slightly increase in the areas where FS woodland projects are adjacent to power line corridors.

Other avian LDS should have no appreciable direct or indirect effects by the Proposed Action or No Amendment due to the pre-existence of early successional habitat within the corridor and the low toxicity of herbicides to birds. These birds that prefer mature forests and also snags and woody debris would not be losing any habitat within the corridor. Cumulatively, adjacent projects which set back the maturity of stands plus the permanency of the early successional corridor may cause decline, at least temporarily, or remain steady.

G. FISHERIES

Existing Condition

The projects are primarily within the Upper Illinois Watershed with shorter portions in the Lower Big Piney and the Richland Creek-Buffalo River Watersheds. The project area traverses a number of small streams as presented in the Hydrology and Water section of this EA. These streams provide habitat for aquatic and semi-aquatic species. Aquatic species include invertebrates such as the crayfish, vertebrates such as fish, and mollusks such as mussels. Semi-aquatic species may include insects and amphibians. Some of these species are listed as threatened, endangered or sensitive and are discussed in the Threatened, Endangered, and Sensitive Species section of this EA.

Fish assemblages in nearby tributaries were determined from surveys conducted by the Southern Research Station's Center for Aquatic Technology Transfer (CATT) out of Blacksburg, Virginia during the summers of 2009 and 2010. Smaller headwater streams are typically dominated by minnow species such as creek chubs and stonerollers and have one or two darter species. Such areas have few if any bass and sunfish. This assemblage resembles what was found in Hurricane Creek and Dry Creek which is expected for this size of watersheds. This type of assemblage would naturally have a lower Index of Biotic Integrity (IBI) value which is classified in part by watershed size, geology, and pool to riffle ratios. In contrast, the slightly larger Falling Water tributary begins to show an increase in the total number of species including bass and sunfish. See Table 14 to review the results of sampling within these tributaries.

Table 14: Fish Assemblages in Tributaries within Project Area Watersheds

Common Name	Tributaries					
	Hurricane Creek		Dry Creek		Falling Water	
	Number	Relative Abundance	Number	Relative Abundance	Number	Relative Abundance
Central Stoneroller	25	9.9	13	1.46	386	38.3
Creek Chub	149	58.9	581	65.13	44	4.4
Horneyhead Chub	0	0	0	0	3	0.3
Bluntnose minnow	0	0	4	0.45	0	0
Ozark minnow	0	0	0	0	84	8.3
Bigeye Shiner	0	0	0	0	68	6.7
Whitetail Shiner	0	0	0	0	20	2.0
Northern Hog Sucker	0	0	0	0	14	1.4
Slender Madtom	25	9.9	48	5.38	40	4.0
Green Sunfish	10	4.0	0	0	3	0.3
Longear Sunfish	0	0	0	0	40	4.0
Smallmouth Bass	0	0	1	0.11	6	0.6
Shadow Bass	0	0	0	0	1	0.1
Redfin Darter	15	5.9	86	9.64	0	0
Fantail darter	0	0	13	1.46	0	0
Greenside Darter	5	2.0	28	3.14	54	5.4
Rainbow Darter	0	0	0	0	123	12.2
Stippled Darter	0	0	4	0.45	3	0.3
Orangethroat Darter	24	9.5	114	12.78	120	12.0
Total number of Species	7		10		16	
Total number of individuals	253		892		1009	

Forest Management Standards limit vegetation management practices, and other management practices in the area of streamside management zones (SMZs).

Proposed Action (PA)

Direct/Indirect Effects

Existing management standards limit the application of vegetation management practices, including the use of approved herbicides and other management practices, in the area of SMZs. Fewer disturbances such as exhaust emissions, noise and soil displacement would occur to existing populations of aquatic/semi-aquatic species because the Proposed Action utilizes foot

traffic instead of heavy equipment for the removal of undesired woody plants. As such, direct and indirect effects to aquatic species are not anticipated as a result of the Proposed Action.

The control of woody stems and invasive species would require herbicides. Given the resource protection measures that minimize herbicide movement into sensitive surface waters, there should be no measurable effect to fisheries from herbicide use. The toxicity and potential risk associated with herbicides used in this project are discussed in the wildlife and water sections. In order to reduce potential adverse effects to non-target species, the herbicides would be applied according to label specifications, would be largely target specific by using methods such as backpack spraying, and would be applied using the guidelines in the Forest Plan.

Cumulative Effects

The Proposed Action would provide long-term beneficial cumulative effects to species in the project areas as the use of heavy equipment for vegetation maintenance would be replaced with less intensive hand-spraying operations. As the herbaceous layer becomes established, the intensity of herbicide application should decrease. Because the Proposed Action would utilize foot access for treatment activities versus heavy mechanical equipment, the use of herbicides would minimize disturbance of species. In addition, the Proposed Action would adhere to all Forest Management Standards and Site Specific design criteria as described in Section 2 of this EA. Therefore, the Proposed Action would not cumulatively affect aquatic/semi-aquatic species.

Alternative 1 (No Amendment)

Direct /Indirect Effects

Under the No Amendment Alternative, current management plans under the existing Special Use permits would continue to guide vegetation management within the project area. Mechanical methods of vegetation control would continue to be utilized including the use of various types of heavy equipment such as chainsaws, mowers, brush hogs, tractors, large trailers for hauling equipment, and helicopters for aerial side trimming.

Many species are highly sensitive to disturbance and noise associated with heavy equipment activity. The use of heavy equipment can produce high levels of noise for short periods of time which may disturb wildlife and aquatic species causing most to flee the area due to the approach of heavy equipment. However, slow-moving species and young remain at risk from impacts with the equipment. In addition, aquatic species are highly susceptible to disturbance and siltation of their aquatic habitat. Generalized cutting with heavy equipment is very effective in controlling woody vegetation; however, the same cutting techniques can directly impact species by inadvertently crushing or causing individuals to flee. Individuals are thus at risk of disturbance, injury or death from impact with the heavy equipment. As such, direct effects to aquatic species are not anticipated as a result of Alternative 1- No Amendment. Equipment may temporarily expose mineral soil and indirectly impact the SMZs through increased sedimentation.

Management standards strictly limit the application of vegetation management practices, and other management practices, in the area of SMZs. As such, direct effects to aquatic species are

not anticipated as a result of Alternative 1- No Amendment. Equipment could temporarily expose mineral soil and indirectly impact the SMZs through increased sedimentation.

Cumulative Effects

Current and planned projects adjacent to the project area are listed in Chapter 2 of this document. In addition, the project would have no measurable impact to aquatic or terrestrial species located outside of the existing Transmission Line #3001 ROW and White Oak Station footprint. Current Forest Service management standards limit the application of vegetation management practices, and other management practices, in the area of SMZs, and near wildlife and their habitat. Any future impacts to aquatic species would be managed according to Forest Service standards consistent with the 2005 Revised Land and Resource Management Plan.

Although the use of heavy equipment for vegetation maintenance may temporarily degrade habitat in the project area and directly affect individuals, this impact would be limited to shortly outside of the timeframe of the mechanized clearing activity itself. Localized areas may have an extended period of disruption if adjacent projects listed in Chapter 2 are being implemented concurrently; however, no measurable adverse cumulative effects to fish population viability within the project area are anticipated if following the standards of the Forest Plan.

H. PROPOSED, ENDANGERED, THREATENED and SENSITIVE SPECIES (PETS)

According to the 1973 Endangered Species Act (ESA), it is unlawful for any person subject to the jurisdiction of the U.S. to take or violate any regulation pertaining to any endangered species of fish or wildlife within the U.S. or territorial seas of the U.S. "Take" is defined in this Act as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. This also includes habitat modification that would result in the death or injury of a federally-listed endangered species. In addition, the ESA states that it is unlawful for any person to remove and reduce to possession any endangered species of plants from areas under federal jurisdiction; to maliciously destroy or damage such species; to remove, cut, dig up, or damage, or destroy any such species (NOAA, 1973). The controlling agencies for the administration of the ESA are the US Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS).

As documented in the ESA, the U.S. has pledged itself to protect all species of flora and fauna that are in danger of or threatened with extinction. Therefore, when proposing any action within the Ozark-St. Francis National Forests, it is crucial to ensure the protection of Threatened, Endangered, and Sensitive Species (TES) possibly inhabiting the forest and the project area. Terms used in the TES analysis are defined below.

Biological Evaluation (BE) - a document that discloses the effects of management activities on PETS species and their associated habitat that occur or are likely to occur in the analysis area.

Threatened Species (T) - Any species (plant or animal) that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range and one that has been designated as a threatened by the Secretary of Interior in accordance with the Endangered Species Act of 1973.

Endangered Species (E) - Any species (plant or animal) which is in danger of extinction throughout all or a significant portion of its range and listed as such by the Secretary of the Interior in accordance with the Endangered Species Act of 1973.

Sensitive Species (S) - Those plant and animal species identified by the Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

Existing Conditions

A review has been completed that examines all known occurrences of Proposed, Endangered, Threatened and Sensitive (PETS) species that occur on the Regional Forester's Sensitive Species list and applicable to the Ozark-St. Francis National Forests. A BE documenting the possible effects to known and potential populations and habitat of TES plant and animal species within the project area was prepared in December 2011 for the Proposed Action. All federally listed threatened or endangered species and all Regional Forester's (Region 8) sensitive species known to occur or with the potential to occur in the Ozark – St. Francis National Forests and within or near the project area were considered in the BE.

All but 17 of the PETS species shown in Table 15 were eliminated from further evaluation due to one or more of the following factors:

- The project area is not within their known, documented geographic range.
- The species has never been documented within the 12-digit watersheds that are adjacent to or encompass the project area or its sphere of influence in field surveys, monitoring activities, reports, or the scientific literature.
- The treatment area does not have suitable habitat for these species.

Table 15: PETS Species Known to Occur or Which May Occur within Project Areas

Common Name	Scientific Name	Classification	Determination (Proposed Action)
Gray Bat	*Myotis grisescens*	Endangered	May affect, not likely to adversely affect
Indiana bat	*Myotis sodalis*	Endangered	May affect, not likely to adversely affect
Ozark Big-eared Bat	*Corynorhinus townsendii ingens*	Endangered	May affect, not likely to adversely affect
Bald Eagle	*Haliaeetus leucocephalus*	Sensitive	May impact, not likely to cause a trend…
Bachman Sparrow	*Aimophila aestivalis*	Sensitive	May impact, not likely to cause a trend…
Ozark Chinquapin	*Castanea pumila ozarkensis*	Sensitive	May impact, not likely to cause a trend…
Southern Lady's Slipper	*Cypripedium kentuckiense*	Sensitive	May impact, not likely to cause a trend…
An isopod	*Lirceus bicuspidatus*	Sensitive	May impact, not likely to cause a trend…
Small headed pipewort	*Eriocaulonn koernickianum*	Sensitive	May impact, not likely to cause a trend…
Moore's Larkspur	*Delphinium newtonianum*	Sensitive	May impact, not likely to cause a trend…
Longnose Darter	*Percina nasuta*	Sensitive	May impact, not likely to cause a trend…
Eastern Small Footed Myotis	*Myotis leibii*	Sensitive	May impact, not likely to cause a trend…
Nearctic Paduniellan Caddisfly	*Paduniella nearctica*	Sensitive	May impact, not likely to cause a trend…
Alabama Snow-wreath	*Neviusia alabamensis*	Sensitive	May impact, not likely to cause a trend…
Ovate-leaf Catchfly	*Silene ovata*	Sensitive	May impact, not likely to cause a trend…
Ozark Spiderwort	*Tradescantia ozarkana*	Sensitive	May impact, not likely to cause a trend…
Open-ground draba	*Draba aprica*	Sensitive	May impact, not likely to cause a trend…

No Critical Habitat for any PET species has been identified within the analysis area. For a complete description of each species needs and habitat conditions, refer to the BE found in the process file for this project.

The following species were added to the PETS list after this draft EA was written, but prior to the 30-day public comment period. These species will be reviewed prior to the final EA, and a supplemental BE will be written for those species that would be within the area of influence from this project. Species in Table 16 in **bold** type are known to occur within the project area.

Table 16: Species currently being evaluated for potential effects by project proposal

Scientific Name	Common Name	Status	Ozark NF Presence	Project Area Presence	Comments

Scientific Name	Common Name	Status	Ozark NF Presence	Project Area Presence	Comments
Lampsilis rafinesqueana	Neosho Mucket Mussel	PE PCH	2	3	Illinois River Watershed; proposed critical habitat Wedington Unit and downstream from Forest boundary
Quadrula cylindrica cylindrica	Rabbitsfoot Mussel	PT PCH	2	3	Illinois River Watershed; War Eagle Creek Watershed; and Buffalo River Watershed (proposed critical habitat downstream of Forest Boundary)
Myotis septentrionalis	**Northern long-eared bat**	PE	1	1	Mist net surveys confirm that Northern long-eared bats are on the Big Piney RD.
Cumberlandia monodonta	Spectaclecase Mussel	E	2	3	Mulberry River Watershed. Pleasant Hill and Boston Mountain RDs.

Status Codes
"E" = species is listed as "Endangered" by the USFWS
"T" = species is listed as "Threatened" by the USFWS
"PE" = species has been proposed to be federally listed as an endangered species by the USFWS
"PT" = species has been proposed to be federally listed as a threatened species by the USFWS
"PCH" = Proposed Critical Habitat

Ozark NF Presence Codes
1 = Species is known to occur on the Ozark National Forest.
2 = Species is not known to occur on Ozark National Forest managed lands, but has suitable habitat within the Forest and a known distribution which makes occurrence possible.
3 = Species does not occur on Ozark National Forest managed lands and is not likely to occur there due to habitat requirements or geographic distribution.

Project Area Presence Codes
1 = Species is known to occur within the project area.
2 = Species is not currently known from the project area, but may occur there due to the presence of suitable habitat and a known distribution that makes occurrence possible.
3 = Species is not currently known from the project area and is not likely to occur there due to habitat requirements or geographic distribution.

The Proposed Action

Direct/Indirect Effects

The Proposed Action would add herbicide application to the current vegetation management strategy. Herbicide application activities are generally applied to specific plant species utilizing

spot treatment or foliar treatment methods. Herbicides would be applied to target woody stem vegetation only, including brush and trees, within the project area, reducing or eliminating the need for mechanical methods. Grasses and other types of non-woody vegetation would not be treated, nor would any products or mixtures be broadcast, sprayed aerially, or applied on the ground or surface waters.

As previously discussed in the BE, the determination was made that the Proposed Action would have **"no effect"** on the interior least tern and speckled pocketbook from implementation of the Proposed Action Alternative within the project area.

The Proposed Action would minimize any potential adverse effects to TES species potentially inhabiting the project area. Many bat species are sensitive to human disturbance during mating and nesting periods and herbicide application on foot would create far less disturbance than heavy mechanical equipment. Furthermore, the application of herbicides by foot would minimize disturbance to creeks and other water bodies which are foraging areas and water sources for the listed species.

If any additional proposed, endangered, or threatened species are discovered prior to or during implementation of the Proposed Action, all activities would be halted until the potential effects could be determined and new mitigations are in place as required.

The BE's determination of 14 Sensitive species was **"may impact individuals, but not likely to cause a trend to federal listing or a loss of viability"** as shown inTable 15.

Although no evidence of use by the gray bat, Indiana bat, and Ozark big-eared bat has been noted in the project area, potential habitats for these species are located within the project area. Best Management Practices would be used, including the use of the Site Specific Designs and Forest Management Standards, to lessen the potential impact to these species and insure that potential habitat for these species would not be impacted. Therefore, for these species it has been determined that the Proposed Action "**may affect, not likely to adversely affect**."

Cumulative Effects

The Proposed Action could provide long-term beneficial cumulative effects to TES species near or traversing the Project area as the use of heavy equipment for vegetation maintenance would be replaced with less intensive hand-spraying operations. In addition, the Proposed Action would adhere to all Management Standards and Project Specific Designs as described in Chapter 2 of this EA. Because the Proposed Action would utilize foot access for treatment activities versus heavy mechanical equipment, the use of herbicides would minimize the disturbance of species. Therefore, the Proposed Action would not cumulatively affect any TES species.

Alternative 1 (No Amendment)

Direct/Indirect Effects

The USFWS and Arkansas Natural Heritage Commission (ANHC) list four federally-listed endangered species in Pope and Searcy counties, Arkansas. These endangered species include the interior least tern (*Sterna antillarum athalassos)*, speckled pocketbook (*Lampsilis streckeri)*,

gray bat (*Myotis grisescens*), and the Indiana bat (*Myotis sodalis*). As summarized in the BE, potential habitats for the interior least tern, and speckled pocketbook were not observed during biological field surveys and/or do not appear to exist within the project area. Subsequently, the BE determination was made for a **"no effect"** to the interior least tern and speckled pocketbook from the No Amendment Alternative.

The No Amendment Alternative would continue project area vegetation management through the use of heavy mechanized equipment. Mechanical methods have the potential to affect the physical characteristics of soils, and in turn affect both the hydrologic function and site productivity of wildlife habitat by creating erosion pathways and compaction of the soil. Many aquatic TES species are highly susceptible to disturbance and siltation of their aquatic habitats.

Generalized cutting with heavy equipment is effective for the immediate control of woody vegetation, which is potentially damaging to power lines, but does not stop the re-growth of many woody plant species. Since the woody stem plants remain viable and re-sprout, there is continual regrowth and increasing competition with grasses and other herbaceous groundcovers that could provide nesting and foraging habitat for many species. Mechanical methods can also produce localized and short term high levels of noise, which can cause temporary adverse effects on TES species. Finally, the use of heavy equipment for vegetation maintenance has also been shown to cause the direct mortality of wildlife by inadvertently crushing or chopping individuals or nests.

Due to the indiscriminant removal of all plant species during vegetation maintenance within the project area, many plants present have the potential to be impacted by mechanical maintenance methods. However, effects of the No Amendment Alternative on plant species are limited to individuals located within the project area and would not cause a trend to potential federal listing or a loss of viability of the plant species.

The determination of sensitive species in the BE will be **"may impact individuals, but not likely to cause a trend to federal listing or a loss of viability".**

Although no evidence of use by the gray bat, Indiana bat, and Ozark big-eared bat has been noted in the project areas, potential habitats for these species are located within the project area. Best Management Practices would be used, including the use of the Site Specific Designs and Forest Management Standards, to lessen the potential impact to these species and insure that potential habitat for these species would not be impacted. Therefore, for these species it has been determined that the No Amendment Alternative "**may affect but not likely to adversely affect**."

Cumulative Effects

No TES species have been recorded within the project area and no evidence of use of the project area was observed during field site reconnaissance activities. Although the use of heavy equipment for vegetation maintenance has the immediate minor adverse effect of degrading wildlife habitat within the project area, the activity is not likely to cause a loss of population viability for any TES species as potential habitat within the project area is currently regularly disturbed by existing vegetation maintenance activities and habitat outside of the project area

would not be affected. Therefore, no measurable cumulative adverse effects to TES species are anticipated by continuing the use of mechanical methods in the No Amendment Alternative.

I. CLIMATE CHANGE

Existing Condition

Although it is possible to quantify a project's direct effects on carbon sequestration and greenhouse gas (GHG) emissions, there is no certainty about the actual intensity of individual project's indirect effects on global climate change. Uncertainty in climate change effects is expected because it is not possible to meaningfully link individual project actions to quantitative effects on climatic patterns. Complete quantifiable information about project effects on global climate change is not currently possible and is not essential to a reasoned choice among alternatives since it would be such a minute factor in the climate change equation. However, based on climate change science, we can recognize the relative potential of some types of proposals and alternatives to affect or influence climate change and therefore provide qualitative analysis to help inform project decisions. Climate change in this assessment focused on using qualitative rather than quantitative analysis.

Forests play a major role in the global carbon cycle by storing carbon in live plant biomass (approximately 50% of dry plant biomass is carbon), in dead plant material, and in soils. Forests contain three-fourths of all plant biomass on earth, and nearly half of all soil carbon. The amount stored represents the balance between absorbing CO_2 from the atmosphere in the process of photosynthesis and releasing carbon into the atmosphere through live plant respiration, decomposition of dead organic matter, and burning of biomass (Krankina and Harmon, 2006).

According to the laws of organic chemistry the process of photosynthesis removes carbon from the atmospheric pool. About half the carbon absorbed through photosynthesis is later released by plants through respiration as they use their own energy to grow. The rest is either stored in the plant, transferred to the soil where it may persist for a very long time in the form of organic matter, or transported through the food chain to support other forms of terrestrial life. When plants die and decompose, or when biomass or its ancient remains in the form of fossil fuels are burned, the original captured and stored carbon is released back to the atmosphere as CO_2 and other carbon-based gases. In addition, when forests or other terrestrial ecosystems are disturbed through harvesting, conversion, or natural events such as fires, some of the carbon stored in the soils and organic matter, such as stumps, snags, and slash, is oxidized and released back to the atmospheric pool as CO_2. The amount released varies, depending on subsequent land use and probably rarely is more than 50% of the original soil store (Salwasser, 2006). As forests become older, the amount of carbon released through respiration and decay can exceed that taken up in photosynthesis, and the total accumulated carbon levels off. This situation becomes more likely as timber stands grow overly dense and lose vigor. Wildfires can cause of a quick carbon release from forests but have little effect on the long term since most carbon released in the fire would eventually be released through decay. At the global scale, if more carbon is released than is captured and stored through photosynthesis or oceanic processes, the concentration of carbon dioxide (CO_2) builds in the atmospheric pool. However, the greatest changes in forest sequestration and storage over time have been due to changes in land use and land use cover,

particularly from forest to agriculture. More recently, changes are due to conversions from forest to urban development, dams, highways, and other infrastructure (Malmsheimer, Heffernan, Brink, et al.).

Proposed Action

Direct Effects:
The proposed herbicide applications associated with the Proposed Action and Alternative 1 would result in a release of some carbon and reduce carbon storage in the ROW both by permanently removing organic matter (trees) and by increasing heterotrophic soil respiration. However, much of the carbon that would be removed is offset by storage in grasses and herbaceous material which would take the place of woody sprouts. With the Proposed Action some of the carbon currently sequestered in young woody vegetation and soils would be released back to the atmosphere. In the short-term, a minor increase in greenhouse gas emissions and an alteration to the carbon cycle would be caused by removing the woody vegetation through herbicide application(s). In the long term, however, these actions would be somewhat offset by the herbaceous vegetation that would take the place of the woody sprouts currently growing in the ROW. Residual stems and regeneration in the proposed project area would continue to sequester and store carbon.

Indirect Effects:
Indirectly, implementation of the Proposed Action would decrease the amount of greenhouse gases released by heavy equipment performing maintenance on the vegetation within the project area every three years.

Cumulative Effects:
As greenhouse gas (GHG) emissions and carbon cycling are integrated across the global atmosphere, it is not possible to determine the cumulative impact on global climate from emissions associated with this project or any number of similar projects. It is not expected that the effects of this project or multiple projects can be specifically attributed the cumulative effects of global climate change. However, the cumulative effects of climate change on this project can be seen in the form of more frequent environmental events such as the red oak borer outbreak in the year 2000, the ice storm of 2009, the tornado event in 2011, and the drought of 2012. This project would incrementally decrease the amount of carbon storage available in the form of young woody species of plants. This would partially be offset by the ability of the herbaceous vegetation which would replace the woody vegetation in this project area. The herbaceous vegetation does not have the ability for long term storage of carbon and the proposed action would result in an overall net loss of woody vegetation for long term carbon sequestration.

Alternative 1: (No Amendment)

Direct Effects:
SWPA's current method of ROW maintenance utilizing heavy equipment would continue. Greenhouse gases would continue to be released by heavy equipment cutting down the woody sprouts in the ROW. This would result in a short-term negative effect of releasing carbon into the atmosphere until the woody vegetation could re-sprout the next growing season and start

sequestering carbon again. Considerably more fuel would be used maintaining the ROW resulting in carbon being released into the atmosphere from the use of that fuel.

Indirect Effects:

No Indirect effects would result from alternative 1

Cumulative Effects:
As GHG emissions and carbon cycling are integrated across the global atmosphere, it is not possible to determine the cumulative impact on global climate from emissions associated with this project or any number of projects. It is not expected that the effects of this project or multiple projects can be specifically attributed to the cumulative effects on global climate change.

A possible cumulative effect with the No Action Alternative is SWPA would continue to maintain the ROW every three years cutting the woody vegetation back to the ground. This would stop any current carbon sequestration from occurring. One other possible negative cumulative effect is that every three years heavy equipment would continue to be utilized to perform the cutting of woody vegetation in the ROW. This requires the burning of fossil fuels which releases GHGs into the atmosphere every three years.

J. HUMAN HEALTH FACTORS

Existing Condition

Chemicals used to control plants are known as herbicides. Herbicides are being considered in the Proposed Action with the goal of incorporating herbicide treatment along with non-chemical treatments. Herbicides kill the existing plant but often allow remaining seeds to germinate. Herbicides are known through experience with similar activities to be one of the most effective treatment methods for eradicating or controlling weed species that currently exist (For the purpose of this document weed species consists of vegetation that may be outside of management desired objective such as non-native invasive species or aggressive native species). When herbicides are used in conjunction with an integrated treatment effort it improves the effectiveness of non-chemical treatments, either concurrently or as follow-up treatments.

The primary herbicides proposed for use within the project area have metsulfuron methyl, triclopyr, imazapyr, and glyphosate as their active ingredients. Mixtures of herbicides could be used where they would provide more effective control, particularly for types of vegetation that may be persistent. Because the herbicides proposed for use do not persist in the soil at effective levels for more than a few months (at the maximum), follow-up treatments may be needed to eliminate new sprouts that were in seed during the initial treatment. The most noticeable consequences from weed treatment would be the long-term, beneficial improvements to native ground vegetation such as grasses and forbs.

Only herbicide formulas/products that have been registered with the Environmental Protection Agency (EPA) for rangeland, forest land, or aquatic use would be applied. In addition, the Forest Service has completed risk assessments that have analyzed the risk of specific herbicides on

human health and safety, on wildlife/fish, and on non-target plants. Only herbicides with a completed risk assessment would be used.

No aerial application of herbicides would be used for this project. Herbicides would be applied using ground-based methods such as hand application using gloves, or spray using a backpack containing the herbicide attached to a flexible sprayer, wand or other hand application device that directs the chemical onto the target vegetation. No motorized or vehicle-mounted application methods will be allowed.

Table 17 explains terminology commonly used in evaluating health risk associated with herbicides.

Table 17: Herbicide Risk Assessment Standard Terminology

Term	Abbrev	Explanation (see risk assessments for specific definitions)
Toxic		The short-term effects of exposure to a chemical, which appear immediately upon exposure. See specific sections of the risk assessments for definition of the various "end points" of exposure, e.g. nervous system.
Sub-chronic		The effects that do not appear immediately, but that would appear over a short period of time after exposure, or if exposure continues for a period of time.
Chronic		Effects over a number of years (or over a lifetime) of repeated exposure
No Observed Adverse Effect Level	NOAEL	The amount of a substance that shows no toxic effects given short term (mg/kg body weight) or to show lack of chronic effects over long duration may be expressed as a dose over time (mg/kg/day).
No Observed Effect Concentration	NOEC	Used for plants to determine the lowest concentration at which a concentration of herbicide had no effect.
Safety Factor		Once a no observable effect level is established, safety factors are applied for the human risk assessments in order to set a reference dose. Safety factors depend on the information used for the no effect finding. Factors include such circumstances as uncertainties in species-to species extrapolation as well as accounting for sensitive individuals in the population. Each factor reduces the exposure dose by dividing by 10, so that a NOAEL of 5 would become an RfD of 0.05 if three safety factors were applied.
Reference Dose	RfD	The amount of a substance that would not have an adverse effect if this does were given every day over a lifespan of 70 years. It is measured in milligrams of substance per kilogram body weight of the person of concern, per day (mg/kg/day). An RfD is basically defined as a level of exposure that would not result in any adverse effects in any individual. The U.S. EPA RfDs are used because they generally provide a level of analysis, review, and resources that far exceed those that are or can be conducted in support of most Forest Service risk assessments. In addition, it is desirable for different agencies and organization within the Federal government to use concordant risk assessment values.
Hazard Quotient	HQ	The result of dividing the reference dose by the expected exposure to provide a measure of the hazard and so a relationship to the expected risk.

The information in this analysis was provided from the SERA identified in Table 18:

Table 18: Herbicide Risk Assessment Information

#	Herbicide Name	Date prepared	Reference	Pages
1	Glyphosate	March 1, 2003	SERA 2003a	281
2	Imazapyr	December 18, 2004	SERA 2004e	149
3	Metsulfuron methyl	December 9, 2004	SERA 2004d	152
4	Triclopyr	March 15, 2003	SERA 2003b	264
5	Fluroxypyr	June 12, 2009	SERA 2009	140

Note: Tank mixes and adjuvants (such as Cide-Kick) may be added to the herbicide to improve effectiveness and control of target species. All herbicides would be applied at rates and use only application methods specified on the label. Additional spot treatments would be needed to reach the desired future condition in some areas.

These are standard risk assessment procedures, tested by several years of EPA use and scrutiny by the larger scientific community. As noted in a number of the risk assessments, the anticipated effects can be minimized or avoided by prudent industrial hygiene practices during proper handling of the herbicides. No chemical has been studied for all possible effects and the use of data from laboratory animals to estimate hazard or the lack of hazard to humans is a process that is fraught with uncertainty. Prudence dictates that normal and reasonable care should be taken in the handling of this or any other chemical. Notwithstanding these reservations, the use of herbicides does not appear to pose any risk of systemic toxic effects to workers or the general public in Forest Service Programs. Risk assessment documents for the specific types of herbicide proposed to be used may be found at http://www.fs.fed.us/foresthealth/pesticide/risk.shtml.

Glyphosate

Description

The active ingredient herbicide *gylphosate* (examples of trade name RoundUp, RoundUp Pro**,** Accord SP) would typically be applied to target vegetation with a directed ground application by back pack or vehicle mounted sprayer, at manufacture's labeled rates per acre. Mixing rates would vary depending on topography and amount of vegetation to be controlled. Repetitive treatments may occur in follow up years if overall treatment is needed. Spot applications would occur in years following the initial treatments to control future growth. Spot applications would be made at the same rate and mixture or less, but would be applied only to small areas as needed, and typically made with backpack or vehicle mounted sprayer.

Risk Summary

The risk characterization for both workers and members of the general public are reasonably consistent and unambiguous. For both groups, there is very little indication of any potential risk at the typical application rate. Even at the upper range of plausible exposures in workers, exposure is below the level of concern, even at the upper levels when broadcast spray is used. For members of the general public, none of the longer-term exposure scenarios exceed or even approach a level of concern. There is no route of exposure or exposure scenario suggesting that the general public would be at risk from longer-term exposure to *glyphosate*. Only exposure

scenarios that contemplate consumption of water directly out of a pond immediately after a spill exceed the levels of concern.

The current risk assessment for *glyphosate* generally supports the conclusions reached by U.S. EPA: Based on the current data, it has been determined that typical application rate does not approach the level of exposure in the reference dose.

At the typical application rate, the exposure to hazardous levels would not be reached or exceeded under worst-case conditions (SERA 2003a).

Imazapyr

Description
Imazapyr would be applied directly to target vegetation with a backpack sprayer, at manufacture's labeled rates (examples of trade name Arsenal, Chopper, Stalker) per acre. In some cases where woody growth is larger, a hack and squirt method or cut stump application may be made directly to each stem. Mixing rates would vary depending on topography and amount of vegetation to be controlled. Repetitive treatments may occur in follow up years if overall treatment is needed. Spot applications would occur in years following the initial treatments to control future growth. Spot applications would be made at the same rate and mixture or less, but would be applied only to small areas as needed. Solutions may contain nonionic surfactants or vegetable-based seed oil to increase surface contact at recommended label rates or have them added according to the manufacturer's label.

Risk Summary
Typical exposures to *imazapyr* do not lead to estimated doses that exceed a level of concern for either workers or members of the general public at either the typical or highest application rate. For workers and the general public, the upper limits of exposure when compared with reference dose are sufficiently below a level of concern that the risk characterization is relatively unambiguous. Based on the available information and under the foreseeable conditions of application, there is no route of exposure or scenario suggesting that the workers or members of the general public would be at any substantial risk from longer term exposure to *imazapyr* even at the upper range of the application rate considered in this risk assessment. The EPA has classified *imazapyr* as a Class E compound, one having evidence of non-carcinogenicity. Under typical and conservative worst-case exposure assumptions, the evidence suggests that no adverse effects would be expected from the application of *imazapyr* (SERA 1999b).

Metsulfuron methyl

Description
Metsulfuron methyl is a selective herbicide that would be used to control brush and certain woody plants, annual and perennial broadleaf weeds, and annual grassy weeds. It is recommended for weed control and suppression in the establishment and maintenance of native grasses along with managing right-of-ways. Commercial products (example: Escort, Ally) contain 60 percent *metsulfuron methyl* and 40 percent inert ingredients. *Metsulfuron methyl* would be applied directly to target vegetation with a back pack or vehicle mounted sprayer, at

manufacture's labeled rates per acre. (Note: One modification to this would be in applications to control Multiflora rose. In that case, a handgun applicator would be used to direct the treatment to the soil within 2 feet of the stem union for each plant). Mixing rates would vary depending on topography and amount of vegetation to be controlled. Repetitive treatments may occur in follow up years if overall treatment is needed. Spot applications would occur in years following the initial treatments to control future growth. Spot applications would be made at the same rate and mixture or less, but would be applied only to small areas as needed. Solutions may contain nonionic surfactants to increase surface contact at recommended label rates or have them added according to the manufacturer's label.

Risk Summary
Typical exposures to *metsulfuron methyl* do not lead to estimated doses that exceed a level of concern. For workers, no exposure scenarios, acute or chronic, exceeds the reference dose, even at the upper ranges of estimated dose. For members of the general public, all upper limits for hazard quotients are below a level of concern. Thus, based on the available information and under the foreseeable conditions of application, there is no route of exposure or scenario suggestion that workers or members of the general public would be at any substantial risk from acute or longer term exposures to *metsulfuron methyl* (SERA 2004d).

Triclopyr

Description
The herbicide *triclopyr* [in a *triethylamine salt* formulation] (example trade name Garlon 3A**,**) would be used on woody vegetation that is less responsive to treatment by *glyphosate*. This herbicide would be applied directly to target vegetation typically with a backpack or vehicle mounted sprayer, at manufacture's labeled rates per acre. Mixing rates would vary depending on topography and amount of vegetation to be controlled. Repetitive treatments may occur in follow up years if overall treatment is needed. Spot applications would occur in years following the initial treatments to control future growth. Spot applications would be made at the same rate and mixture or less, but would be applied only to small areas as needed. Except for aquatic treatments, solutions may contain nonionic surfactants to increase surface contact at recommended label rates or have them added according to the manufacturer's label.

In some cases where woody growth is larger, a hack and squirt method or cut stump application may be made directly to each stem. The rate of application if this method is used would be in a 1:1 ratio or undiluted. *Triclopyr* (ester) the oil based formulation (one trade name being Garlon 4) has similar application methods as the *triclopyr triethylamine* formulation described above. Additional application methods for *Triclopyr* (ester) include; broadcast foliar ground applications, which involve the use of a two- to six-nozzle boom mounted tank and sprayer on a tractor or other heavy duty vehicle.

Risk Summary
There is no indication that workers would be subject to hazardous levels of either form of *triclopyr* at the typical application rate and under typical exposure conditions. Nonetheless, at the upper range of exposures, all application methods exceed the level of concern based on the chronic reference dose (but not the acute RfD). Thus, for workers who may apply *triclopyr* (any

formulation) repeatedly over a period of several weeks or longer, it is important to ensure that work practices involve reasonably protective procedures to avoid the upper extremes of potential exposure. At higher application rates, particularly rates that approach the maximum application rate of 10 lbs/acre, measures should be taken to limit exposure. These measures would need to be developed on a case-by-case basis depending on the specific application rates that are used and the type of the applications that are employed. For members of the general public, the risk characterization is relatively unambiguous at the typical application rate and under the foreseeable conditions of exposure. There is no route of exposure or exposure scenario suggestion that the general public would be at risk from longer term exposure to either form of *triclopyr*. Even at the maximum projected application rate of 10 lbs/acre, the only long-term scenario that exceeds the level of concern is the consumption of contaminated fruit. Several acute exposures also lead to exposure to levels that are above the level of concern. For instance, accidental spray over the lower legs as well as contacting contaminated vegetation both exceed the level of concern at the central estimate of exposure when the highest application rate is considered to be (10 lbs/acre). All dermal exposures exceed the level of concern. These dermal exposure assessments are extremely conservative and designed to identify which possible types of exposure would be most hazardous. For *triclopyr*, such scenarios include dermal contact and accidental spills into water (SERA 2003b).

Fluroxypyr

Description

The Herbicide *fluroxypyr* which includes the trade name, Vista XRT (Ultra), is a chemical which controls a wide range of broadleaf weeds and woody brush. *fluroxypyr* is classified as a Group I Herbicide, with a mode of action where the weed cannot grow due to disruption of plant cell growth. *Fluroxypyr* belongs to the Pyridines group of chemicals. *Fluroxypyr* is registered as a spray treatment for the control of a wide range of broadleaf weeds and woody species. Application methods for larger areas would be by hydraulic spray (typically broadcast sprays using truck/tractor mounted equipment) or pull behind trailers with tanks and boom sprayers wick type application may also be utilized. Small areas would be treated by backpack application (selective foliar application or spot treatments). Application rates would be according to the manufacturer's label. Further details of use can be found in the Direction of Use section on the Product Label. *Fluroxypyr* would be mixed with *triclopyr* (Garlon 3) to achieve the desired results in certain circumstances.

Risk Summary

General exposures to workers in terms of normal conditions, for prolonged application times even at the highest application rate, exposure levels of *fluroxypyr*-MHE are substantially below the level of concern. Dermal exposures to *fluroxypyr* are not likely to pose a risk to workers. Damage to eyes studies concerning the irritant effects of Vista XRT formulation, the more concentrated formulation of *fluroxypyr*-MHE are not available. While somewhat speculative, the more highly concentrated Vista XRT formulation (45.52% a.e.) may pose a greater risk of eye damage to workers than a diluted formulation would pose. General public the risk characterizations for all non-accidental exposure scenarios are easily interpreted, and there is no basis for assuming plausible risks to the general public. The upper bounds of the other non-accidental acute exposure scenarios for the general public are below the level of concern by

factors from about 10 to greater than 1400 (SERA, 2009). The EPA has not made a common mechanism of toxicity finding for *fluroxypyr* and any other substances, and *fluroxypyr* does not appear to produce a toxic metabolite produced by other substances. For the purposes of this tolerance action, therefore, EPA has not assumed that *fluroxypyr* has a common mechanism of toxicity with other substances. U.S. EPA/OPP, 2004e, p. 73.

Sub-Chronic and Chronic Toxicity
Considerable information exists on sub-chronic and chronic effects due to exposure to herbicide in controlled animal studies. Sub-chronic and chronic effects are those that might occur over a long period of time, after weeks or years of exposure. Sub-chronic and chronic effects are reviewed in terms of potential impacts to their potential neurological or reproductive effects. These evaluations assume some lower threshold level below which these effects would not occur.

Other potential health effects evaluated include the herbicide potential to be carcinogenic, mutagenic, or teratogenic. These impacts are not threshold dependent, and so they are evaluated under the assumption that any level may cause the health effect. Hence, they rely on probability, based on exposure levels.

Considering anticipated exposure levels to workers and the public all five herbicides express evidence of non-carcinogenicity. Also, Glyphosate, Fluroxypyr and Imazapyr show no evidence on being mutagenic or reproductive while Metsulfuron methyl and Triclopyr evidence showed no to slight chance of mutagenic or reproductive effects.

In summary, the five herbicides considered for use in the Proposed Action are not expected to create a health concern for carcinogenic, mutagenic, teratogenic, sub-chronic, or chronic effects to the workers or to the general public. Since use of herbicide in ROW poses a low risk and usage is likely to occur only once or twice over 5 to 7 year period.

Proposed Action

Direct/Indirect effects
The term public includes hikers, campers, hunters, fuel-wood gatherers, and other forest users. It basically includes all people who use or work in the project area except those who work with the herbicide treatments.

Risk to the public due to herbicide use is not likely to occur because none of the herbicides are persistent in the environment or in the human body. Also, none of the herbicides proposed to be used in this project bio-accumulates in animal tissues, so there is no threat of human exposure by eating animals that have come into contact with the vegetation on which herbicides were applied. The greatest possible risk to the public would be due to a spill of highly concentrated herbicide. This is highly unlikely since the workers mixing and using the chemical would be mixing it off site and only taking with them an amount of mixed herbicide sufficient for one day's application. This would result in a safer working environment for forest workers and forest visitors.

Cumulative effects
No cumulative effects are expected. As shown above effects can be minimized or avoided by prudent hygiene, proper handling and following label application rates. Generally speaking, contamination of workers, the public or the environment shows very little indication of any potential risk at the typical label recommended application rates and methods.

Alternative 1 (No Action)

Direct/Indirect effects
No herbicides would be applied in the project area. No direct or indirect consequences to human health would occur related to herbicides.

As shown in Table 7on page II-5, Alternative 1 would have greater risk to workers due to longer exposure performing maintenance work on the ROW using heavy equipment. The risk to injury to workers is greater and the ROW maintenance would need to be performed more times over a 10-year period.

Cumulative effects
No herbicides would be applied in the project area. So there would be no cumulative effects concerning herbicide use.
When considering the health and safety of workers

Below is a copy of Table 7 found on page II-5 of this EA. Note the "Human Health Risk (man-hours lost)" row and compare Alternative 1 with the Proposed Action. It is clear that the risk to workers would increase if Alternative 1 is chosen.

Table 7: Comparison of Alternatives

	Alternative I					**Proposed Action**			
Years	**1**	**3**	**6**	**9**	**Total**	**1**	**5**	**10**	**Total**
Soil Compaction	Low	Low	Low	Low	Low	Low	None	None	Low/None
Sediment	Low	Low	Low	Low	Low	Low	None	None	Low/None
Water Quality	Good	Good	Good	Good	Good	Good	Good	Good	Good
Human Health Risk (man-hours lost)	103.2	103.2	103.2	103.2	412.8	103.2	70.2	46.8	220.2
Economic Costs (Thousands of $)	$145	$149	$153	$158	$605	$116	$87	$58	$261
% Reduction of Woody Vegetation	0	0	0	0	0	0	25	50	50
Acres Treated (% of total)	211.5 (85%)	211.5 (85%)	211.5 (85%)	211.5 (85%)	211.5 (85%)	211.5 (85%)	160 (64%)	105 (42%)	105 (42%)

Source: SWPA, 2012

Assumptions:

- *Alternative I requires mechanical vegetation management across the total permit area (approximately 249.5 acres) every three years.*
- *The Proposed Action would necessitate both mechanical and herbicide treatment across 85% of the permit areas during the first year only (repeat herbicide applications would diminish over time)*
- *Human Health Risk based on injury/illness exposure to hazards of utilizing heavy equipment and chainsaws vs. exposure to environmental hazards of working in outdoor environment expressed in man hours. Total man-*

*hours per year = 2,400 (15 weeks work *40 hours per week * 4 workers). 2009 Incidence rates: Construction 4.3, Outdoor Labor Contractors 3.9 (OSHA, 2009).*

- *Economic cost is the total cost of implementation of each alternative.*
- *% reduction of woody vegetation based on reduction of stem count after treatment. No stem count reductions apply after mechanical clearing as woody vegetation would re-sprout.*
- *Estimated existing vegetation habitat/coverage within the Project Area consist of 85% woody species (approx. 211.5acres), 10% riparian habitat (approx. 25.5acres), and 5% grassy/grazing lands (approx. 12.5 acres). Limited or no treatment applied to riparian and grassy areas.*

K. Heritage Resources

Existing Condition

This project proposal falls under archeological protocols specified by an existing Programmatic Agreement between the United States Forest Service, Native American Federally-recognized Tribes, and the Arkansas State Historic Preservation Office (SHPO). This Programmatic Agreement is authorized by and complies with the National Historic Preservation Act of 1966 (NHPA), as amended (80 Stat. 915 et seq.; 16 U.S.C. 470 et seq.). The project area has received inventory under previous projects, and a complete archeological inventory has been completed in conjunction with this project. A Heritage Categorical Exclusion was completed and on file at the Supervisor's Office in Russellville, AR.

Proposed Action

Direct/Indirect Effects

The Proposed Action could have an indirect negative effect on historical properties due to increased people and vehicle traffic in and around the activity area where sites are located. Known sites would be protected by excluding them from the activity area; however, the sites could be exploited by having workers or visitors in and around the sites in the vicinity of the activity area.

Any new site discoveries made during project implementation would have the following actions taken: implementation of the activity would cease until an archeologist could record the site and make a determination of eligibility. The archeologist would recommend/implement any site specific project designs to ensure the protection of the site.

Cumulative Effects

There would be no cumulative effects to heritage resources.

Alternative I (No Action)

Direct/Indirect Effects

Alternative 1could have a negative effect on historical properties due to continued maintenance of the ROW by using heavy equipment if the equipment gets outside of the ROW area and into an adjacent site with heavy equipment. The equipment could damage the site.

Alternative I (No Action

Cumulative Effects

There would be no cumulative effects to heritage resources.

Chapter IV

Coordination and Consultation

The Forest Service consulted the following individuals, Federal, Tribal, State, and local agencies during the development of this environmental assessment:
ID Team Members by Location:

Ozark National Forest – Big Piney Ranger District:

Terry Hope - Recreation Assistant
Jim Dixon – Integrated Resources Team Leader
Dwayne Rambo - Wildlife Biologist
Rickey Adams – Engineering Technician
Sarah Davis – Wildlife Biologist
Kenney Smedley – Engineering Technician
Mike Mulford – NEPA Coordinator
Sam Clark – Silviculturist
Anthony Harris – Timber Management Officer
Mark Morales – Fire Management Officer
Leif Anderson – Forester
Mike Walden – Heritage Resources Technician
Michael (Smoke) Pfeiffer – Archeologist
Chris Brightwell – Integrated Resources Crew Leader
Heath Thomas - Integrated Resources Crew Leader

Ozark National Forest – Supervisor's Office:

Rick Monk – Hydrologist
J. Keith Whalen – Forest Fisheries Biologist
Marvin L. Weeks – Forest Soil Scientist
Dr. David Jurney – Archeologist
Kathy King – Writer/Editor

Arkansas Game and Fish Commission

A J Riggs – Wildlife Management Supervisor

Federal, Tribal, State, and Local Agencies:

Theo Witsell – Arkansas Natural Heritage Commission
Arkansas State Historic Preservation Office
US Forest Service Research
US Fish and Wildlife Service
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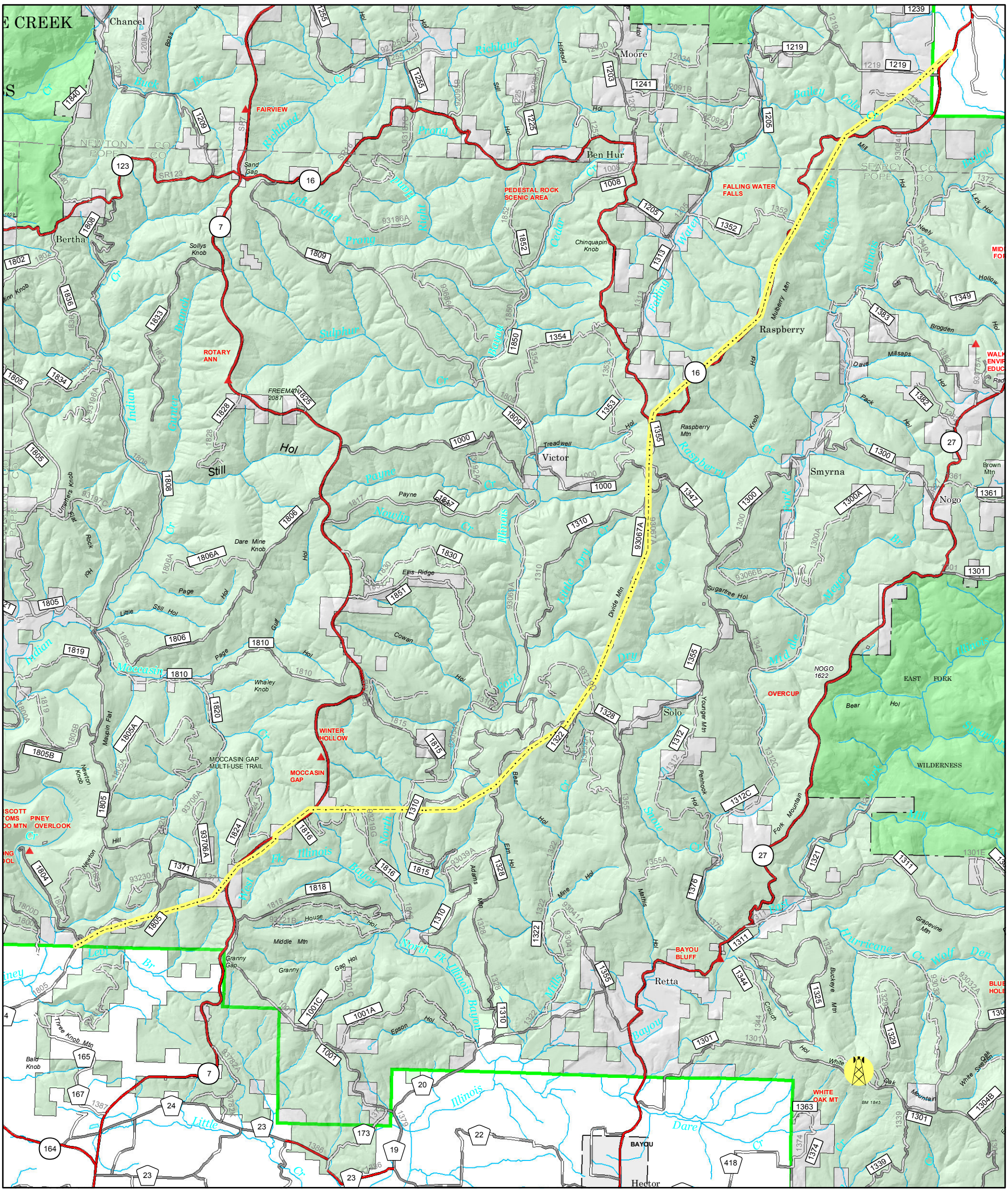
Historic Preservation Office Peoria Tribe of Oklahoma
Jack Shadwick Historic Preservation Officer Modoc Tribe of Oklahoma
Historic Preservation Officer Ponca Tribe of Oklahoma
Joyce Bear Historic Preservation Officer Muskogee (Creek) Nation
John Berry Tribal Historic Preservation Officer
Dr. Andrea Hunter Historic Preservation Officer Osage Nation
Sandra Massey Historic Preservation Officer Sac and Fox Nation of Oklahoma
Rhonda Dixon Historic Preservation Officer Ottawa Tribe of Oklahoma
Natalie Deere Historic Preservation Office Seminole Nation of Oklahoma
Richard Goulden Historic Preservation Officer Otoe-Missouri Tribe of Oklahoma
Chris Franks Historic Preservation Officer Seneca-Cayuga Tribe of Oklahoma
Frank Morris Repatriation Coordinator Pawnee Nation of Oklahoma
Historic Preservation Office Shawnee Tribe of Oklahoma
Historic Preservation Office Thlopthlocco Tribal Town
Josh Waffle Historic Preservation Officer Tonkawa Tribe of Oklahoma
Lisa Stopp Historic Preservation Officer United Keetoowah Band of Cherokee
Stratford Williams Historic Preservation Officer Wichita and Affiliated Tribes
Sherry Clemons Historic Preservation Officer Wyandotte Tribe of Oklahoma

Southwest Power Administration

Utility Corridor and Tower Site Vegetation Management Environmental Assessment

Ozark-St. Francis National Forests

Big Piney Ranger District



Legend

- Southwest Utility Corridor
- Southwest Power Com Site
- National Forest Lands

0 0.5 1 2 3 Miles

The Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. They may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised, etc. Using GIS products for purposes other than those for which they were created, may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. For more information contact: Ozark – St. Francis NFs, 605 W. Main St, Russellville, AR 72801 (479)-964-7211. trh 05/17/2011

APPENDIX B

Supporting Literature

Arkansas Department of Pollution Control and Ecology Commission (APCEC), Regulation Number 2- Regulation establishing water quality standards for surface waters of the State of Arkansas, Amended April 28, 2006

Arkansas Department of Environmental Quality (ADEQ), 2012 Groundwater Protection Program on the web at: http://www.adeq.state.ar.us/water/branch_planning/#groundwater_protection. Accessed May 18, 2012.

Arkansas Department of Environmental Quality (ADEQ), 2010 Arkansas Water Quality Inventory on the web at:
http://www.adeq.state.ar.us/water/branch_planning/303d/303d.htm#maps Accessed May 15, 2012.

Askins RA, Folsom-O'Keefe CM, Hardy MC (2012) Effects of Vegetation, Corridor Width and Regional Land Use on Early Successional Birds on Powerline Corridors. PLoS ONE 7(2): e31520. doi:10.1371/journal.pone.0031520

Chandler, R. B., D. I. King, *and* S. DeStefano. 2009b. Scrub-shrub bird habitat associations at multiple spatial scales in beaver meadows in Massachusetts. *The Auk* **126***:*186–197.

Commission for Environmental Cooperation [CEC]. 1997. Ecological regions of North America: toward a common perspective.

Confer, J. L. and *S. M. Pascoe*. 2003. "The avian community on utility rights-of-ways and other managed shrublands in northeastern United States". *Forest Ecology and Management* 185:193-205.

Cornell Extension Toxicology Network. 1993. Metsulfuron methyl EXTONET
http://pmep.cce.cornell.edu/profiles/extoxnet/metiram-propoxur/metsulfuron-methyl-ext.html
Accessed 8/2/2013.

Durkin, P.R. 2011a Glyphosate. Human Health and Ecological Risk Assessment Final Report. Syracuse Environmental Research Associates, Inc. Manlius, N.Y. 336p.
http://www.fs.fed.us/foresthealth/pesticide/risk.shtml Accessed 9/20/2012.

Durkin, P.R. 2011c Imazapyr-Human Health and Ecological Risk Assessment Final Report. Syracuse Environmental Research Associates. Inc. Manlius, N.Y. 215 p.
http://www.fs.fed.us/foresthealth/pesticide/risk.shtml Accessed 9/20/2012.

Durkin, P.R. 2011b Triclopyr- Revised Human Health and Ecological Risk Assessment Final Report. 267 p. Syracuse Environmental Research Associates. Inc. Manlius, N.Y. 215 p.
http://www.fs.fed.us/foresthealth/pesticide/risk.shtml Accessed 9/20/2012.

(EPA AIRS web site at www.epa.gov.data/index.html)

{Forlani et al. 1995} Forlani G; Mantelli M; Branzoni M; Nielsen E; Favilli F. 1995. Differential sensitivity of plant-associated bacteria to sulfonylurea and imidazolinone herbicides. Plant and Soil. 176 (2):243-253. [RA2004]

Forest Service, 2005b. "Final Environmental Impact Statement for the Revised Land and Resource Management Plan Ozark-St. Francis National Forests, Arkansas". Management Bulletin R8-MB-125 B. September 2005.

Forest Service, 2005a. "Revised Land and Resource Management Plan for the Ozark-St. Francis National Forests". Management Bulletin R8-MB 125 A. September 2005.

(Ganapathy 1997, DowAgroSciences
2002, USDA Forest Service 1995, Schuette 1998).

Harmon, D., J.J. Lockhart, G. Sabo, III. 1996. From surveyor's chains to satellites: a study of historic environmental change and land use on the Lee Creek Unit of the Ozark National Forest, Crawford and Washington Counties, Arkansas. Arkansas Archeologic.

Klotzbach, J. and P. R. Durkin 2005. Metsulfuon methyl Human Health and Ecological Risk Assessment Final Report. Syracuse Environmental Research Associates Inc. Manlius, N.Y. 152 p.http://www.fs.fed.us/foresthealth/pesticide/risk.shtml Accessed 8/2/2013.

Lockhart, J. J., J.E. Hilliard, Jerry E., G. Sabo, III, D.A. Weddle. 1995. The evolution of human ecosystems in the Ozark National Forest, a pilot study of Lee Creek Unit. Arkansas Archeological Survey Project 876. Fayetteville, AR: AR Archeology

Maxwell, J.R.; Neary, D.G. 1991. Vegetation management effects on sediment yields. In: Shou-Shou, T.; Yung-Huang, K. (eds.). Proceedings of the 5th interagency sediment conference. Washington, DC: Federal Energy Regulatory Commission. 2: 12–63.

Michael, J.L.; Gibbs, H.L.; Fischer, J.B.; Webber, E.C. 2000. Protecting Surface Water Systems on Forest Sites Through Herbicide Use. Proceedings World Water Congress, Melbourne, Australia.

Miller, K.V. and J.H. Miller. 2004. Forestry herbicide influences on biodiversity and wildlife habitat in southern forests. Wildlife Society Bulletin 32:1049–1060.

Neary, D.G. and J.L. Michael. 1996. Herbicides - protecting long-term sustainability and water quality in forest ecosystems. New Zealand Journal of Forestry Science 26:288-297.

Neary, D. G., P. B. Bush and J. L. Michael. 1993. Fate, dissipation and environmental effects of pesticides in southern forests: a review of a decade of research progress. Environmental Toxicology and Chemistry 12:411-428.

Neary, D.G. 1985. Fate of Pesticides in Florida's Forests: An Overview of Potential Impacts in Water Quality. In *Proceedings Soil and Crop Science Society of Florida*, pp. 18-24.

Omernik, J.M. 1987. Ecoregions of the contreminous United States. Map (scale 1:7,500,000) revised August 2002. Annals of the Association of American Geographers 77:(1) 118-125.

Gerstäcker, F. 1881. Wild sports in the far West. New York: J.W. Lovell. Pg 409.

RED Facts: Glyphosate; EPA-738-F-93-011; U.S. Environmental Protection Agency, Office of Prevention, Pesticides, and Toxic Substances, Office of Pesticide Programs, U.S. Government Printing Office: Washington, DC, 1993.

RED Facts: Triclopyr; EPA-738-F-98-007; U.S. Environmental Protection Agency, Office of Prevention, Pesticides, and Toxic Substances, Office of Pesticide Programs, U.S. Government Printing Office: Washington, DC, 1998.

Southwestern Power Administration, 2011. Biological Evaluation for the Environmental Assessment "Proposal to Amend a Special Use Permit to Allow Herbicide Use for Transmission Line No. 3001 and White Oak Radio Station in the Ozark National Forest Pope & Searcy Counties, Arkansas". December 2011.

U.S.D.A. Natural Resources Conservation Service 2005. Soil Survey Geographic Database for Pope County, Arkansas. Forth Worth, Texas.

U.S.D.A. Natural Resources Conservation Service 2005. Soil Survey Geographic Database for Searcy County, Arkansas. Forth Worth, Texas.

United States Department of Agriculture (USDA). 2003-2004. Risk Assessments – Human Health and Ecological Risk Assessments. Risk Assessments for Triclopyr, Metasulfuron Methyl, Glyphosate, Imazapyr, Picloram, and Sulfometuron Methyl. From the following USDA website: http://www.fs.fed.us/foresthealth/pesticide/risk.shtml.

United States Department of Agriculture (USDA), 2009. "Utility Corridor Vegetation Management Environmental Assessment". July 2009.

United States Geological Survey (USGS) National Water Information System: Web Interface located at http://nwis.waterdata.usgs.gov/ar/nwis/gwlevels. Accessed November 12, 2008.

USDA Forest Service. 2005a. Revised Land and Resource Management Plan, Ouachita National Forest, Arkansas and Oklahoma. Forest Service, Southern Region, Management Bulletin R8-MB 124 A.

USDA Forest Service. 2005b. Final Environmental Impact Statement, Revised Land and Resource Management Plan, Ouachita National Forest, Arkansas and Oklahoma. Forest Service, Southern Region, Management Bulletin R8-MB 124 B.

USDA Forest Service. 1999a. Ozark-Ouachita Highlands Assessment: Terrestrial Vegetation and Wildlife. General Technical Report SRS-35. p 201.

USDA Forest Service Southern Region, 2005a. "Revised Land and Resource Management Plan for the Ozark-St. Francis National Forests". Management Bulletin R8-MB 125 A. September 2005.

USDA Forest Service Southern Region, 2005b. "Final Environmental Impact Statement for the Revised Land and Resource Management Plan Ozark-St. Francis National Forests, Arkansas". Management Bulletin R8-MB-125 B. September 2005.

USDA Forest Service. 2009. Fluroxypyr Human Health and Ecological Risk Assessment Final Report. Published under contract with Syracuse Environmental Research Associates, Inc., (USDA FS Contract No. AG-3187-C-06-0010). Fayetteville, New York, USA. 218 pp. Retrieved from http://www.fs.fed.us/foresthealth/pesticide/pdfs/0521303a_fluroxypyr.pdf

USDA FOREST SERVICE. 2011. Glyphosate- Human Health and Ecological Risk Assessments Final Report. Published under contract with Syracuse Environmental Research Associates, Inc. (USDA FS Contract No. AG-3187-C-06-0010**)** Manlius, New York, USA. 313pp. Retrieved from http://www.fs.fed.us/foresthealth/pesticide/pdfs/Glyphosate_SERA_TR-052-22-03b.pdf

USDA FOREST SERVICE. 2011. Imazapyr- Human Health and Ecological Risk Assessments Final Report. Published under contract with Syracuse Environmental Research Associates, Inc. (USDA FS Contract No. AG-3187-C-06-0010) Manlius, New York, USA. 203 pp. Retrieved from http://www.fs.fed.us/foresthealth/pesticide/pdfs/Imazapyr_TR-052-29-03a.pdf

USDA FOREST SERVICE. 2004. Metsulfuron Methyl- Human Health and Ecological Risk Assessments Final Report. Published under contract with Syracuse Environmental Research Associates, Inc. (GSA Contract No. GS-10F-0082F), Fayetteville, New York, USA. 152 pp. Retrieved from http://www.fs.fed.us/foresthealth/pesticide/pdfs/120904_Metsulfuron.pdf

USDA FOREST SERVICE. 2011. Triclopyr- Human Health and Ecological Risk Assessments Final Report. Published under contract with Syracuse Environmental Research Associates, Inc (USDA FS contract No. AG-3187-C-06-0010). Manlius, New York, USA. 251 pp. Retrieved from http://www.fs.fed.us/foresthealth/pesticide/pdfs/052-25-03aTriclopyr.pdf

Wiken, E. 1986. Terrestrial ecozones of Canada. Environment Canada. Ecological Land Classification Series No. 19. Ottawaa.

Woods, A.J., J.M. Omernik, D.D. Brown and C.W. Kiilsgaard. 2004. Level III and IV ecoregions of Pennsylvania and the Blue Ridge Mountains, the Ridge and Valley and Central Appalachians of Virginia, WVirginia and Maryland. EPA/600/R-96/077.

Woods, et. al. 2005. Ecoregions of Arkansas, Reston, Virginia, U.S. Geological Survey, Scale – 1:1,000,000; from the following webpage: ftp://ftp.epa.gov/wed/ecoregions/ar/ar_eco_lg.pdf.

APPENDIX C

Public Involvement

To encourage public participation in the **Southwestern Power Administration Utility Corridor and Tower Site Vegetation Management Project** decision process, an initial scoping letter and map was mailed to 88 neighboring landowners, the Native American Tribes, and other interested parties, explaining the project proposal on June 3rd, 2011. They were asked to comment on, or involve themselves in, the proposed project, and were informed about the kinds of decisions to be made. The project was also published in the Ozark- St. Francis National Forest Schedule of Proposed Actions and on the Forest planning website. An initial scoping letter was also published in Russellville's *The Courier* (The Official Paper of Record for the Big Piney Ranger District) on June 19th, 2011, requesting comments, questions, and offering detailed information to those expressing an interest in the project. The initial scoping effort resulted in five responses (2 from Native American Tribes and 3 from members of the public).

The Draft Environmental Assessment (EA) was not completed in 2011 due to other priorities. During this time, the regulations the National Forest works under changed from 36CFR 215 to 36CFR 218 (the objection process). Since the Draft EA had not been sent out for its official 30-day comment period, a decision was made to switch the project to the 36CFR 218 process. As a result, on May 20th, 2013, a second project initiation letter was mailed out to 92 neighboring landowners, the Native American Tribes, and other interested parties. The letter including a map explained the project proposal and the change from the 36CFR 215 regulations to the 36CFR 218 regulations. A legal notice was published in Russellville's *The Courier* on May 21st, 2013, and the project initiation letter was posted to the Ozark-St Francis National Forest Website. Eight letters were returned as undeliverable. This public involvement effort resulted in two responses from the public.

All interested parties who responded to our public involvement efforts will receive a notice informing them that the Draft EA is ready for review.

Internally, the Interdisciplinary (ID) Team met to develop the Proposed Action and the Alternatives which were analyzed in the EA. The ID team developed "Key Issues" from meetings and public scoping. A "Key Issue" is an issue for which an alternative would be developed and considered in detail.